



mahlum



CONSTRUCTION DOCUMENTS  
PROJECT MANUAL  
VOLUME 1

ROOSEVELT MIDDLE SCHOOL  
EUGENE SCHOOL DISTRICT 4J  
EUGENE, OREGON

CIP NO. 410.566.001

FEBRUARY 18, 2015

**PROJECT TITLE PAGE**

**PROJECT TITLE:**

**ROOSEVELT MIDDLE SCHOOL REPLACEMENT PROJECT**

**CIP No. 410.566.001**

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Eugene, Oregon 97405

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**DATE:**

**18 FEBRUARY 2015**

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**END OF SECTION**

**INVITATION TO BID**

Sealed bids will be received by Kathi Hernandez, Facilities Management Assistant, for the Roosevelt Middle School Replacement project, CIP No. 410.566.001, on March 19, 2015 until the Deadline for Bid Submission at 2:00 pm local time at the Eugene School District 4J Facilities Management Office, 715 West Fourth Avenue, Eugene, Oregon 97402. The Bids will be opened publicly and read aloud immediately after the deadline for submission of bids. Late Bids will not be considered.

Briefly, the work is described as the construction of a new two story middle school, demolition of the existing single story middle school and related site development work. The project is located at 680 East 24<sup>th</sup> Avenue, Eugene, Oregon.

Beginning Friday, February 20, 2015, Prime Bidders, Sub-bidders, and Suppliers may obtain bidding documents at the following hyperlink: <http://4j.lane.edu/bids/> Hard copies are not provided by the School District.

Bidding Documents may be examined at the following locations:

Eugene Builder's Exchange, 2460 W. 11th, Eugene, OR 97402  
 Central Oregon Builders Exchange, 1902 NE 4th Street, Bend, OR 97701  
 McGraw Hill Construction, 3461 NW Yeon Ave, Portland, OR 97210  
 Daily Journal of Commerce Plan Center, 921 SW Washington St., Ste 210, Portland, OR 97205-2810  
 Douglas County Plan Center, 3076 NE Diamond Lake Blvd, Roseburg, OR 97470  
 Oregon Contractor Plan Center, 5468 SE International Way, Milwaukie, OR 97222  
 Reed Construction Data, 30 Technology Parkway South, Ste 500, Norcross, GA 90092  
 Salem Contractor's Exchange, 2256 Judson Street SE, Salem, OR 97309  
 Willamette Valley Bid Center, 33862 SE Eastgate Circle, Corvallis, OR 97333

A Non-Mandatory pre-bid conference and walk-through has been scheduled for Wednesday, February 25, 2015, beginning at 3:30 PM at Roosevelt Middle School, Main Lobby. Pre-qualification of Bidders is not required.

Each Bid must be submitted on the prescribed form and accompanied by a Surety Bond, Cashiers Check, or Certified Check, executed in favor of Eugene School District 4J, in the amount not less than ten percent (10%) of the total bid, based upon the total bid amount for those items bid upon.

Either with the Bid or within two working hours of the Deadline for Submission of Bids, bidders shall submit, on the form provided, information for first-tier subcontractors furnishing labor or labor and materials, as provided in ORS 279C.370. Bids for which disclosure forms are required, but not submitted, will be rejected.

No bid for a construction contract will be received or considered unless the Bidder is registered with the Construction Contractors Board or licensed by the State Landscape Contractors Board at the time the Bid is made, as required by OAR 137-049-0230.

For every bid \$100,000 or greater, all Contractors and Subcontractors shall have a public works bond, in the amount of \$30,000, filed with the Construction Contractors' Board (CCB), before starting work on the project, unless exempt.

Each Bid shall contain a statement indicating whether the Bidder is a "resident bidder", as defined in ORS 279A.120.

Each Bid shall contain a statement that the "Contractor agrees to be bound by and will comply with the provisions of ORS 279C.800 through 279C.870 regarding payment of Prevailing Wages".

Contractor shall certify nondiscrimination in obtaining required subcontractors, in accordance with ORS 279A.110 (4).

School District 4J reserves the right to (1) reject any or all Bids not in compliance with all public bidding procedures and requirements, (2) postpone award of the Contract for a period not to exceed sixty (60) days from the date of bid opening, (3) waive informalities in the Bids, and (4) select the Bid which appears to be in the best interest of the District.

Date: February 17, 2015  
By: Kathi Hernandez, Facilities Management Assistant  
Published: Register Guard, Daily Journal of Commerce, ORPIN (Oregon Procurement Information Network)  
Posted: School District 4J Administration Office  
200 North Monroe  
Eugene, OR 97403

**END OF INVITATION TO BID**

**INSTRUCTIONS TO BIDDERS**

**PART 1 GENERAL**

**1.01 STANDARD FORM**

- A. Instructions to Bidders, AIA Document A701, 1997 Edition, immediately following are part of this Project Manual.

**END OF SECTION**



**AIA**<sup>®</sup>

# Document A701<sup>™</sup> – 1997

## ***Instructions to Bidders***

**for the following PROJECT:**

*(Name and location or address)*

Blank AIA Documents

**THE OWNER:**

*(Name, legal status and address)*

**THE ARCHITECT:**

*(Name, legal status and address)*

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**ADDITIONS AND DELETIONS:**

The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed. 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.

## **ARTICLE 1 DEFINITIONS**

§ 1.1 Bidding Documents include the Bidding Requirements and the proposed Contract Documents. The Bidding Requirements consist of the Advertisement or Invitation to Bid, Instructions to Bidders, Supplementary Instructions to Bidders, the bid form, and other sample bidding and contract forms. The proposed Contract Documents consist of the form of Agreement between the Owner and Contractor, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications and all Addenda issued prior to execution of the Contract.

§ 1.2 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.

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

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

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

§ 1.6 An Alternate Bid (or Alternate) is an amount stated in the Bid to be added to or deducted from the amount of the Base Bid if the corresponding change in the Work, as described in the Bidding Documents, is accepted.

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

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

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

## **ARTICLE 2 BIDDER'S REPRESENTATIONS**

§ 2.1 The Bidder by making a Bid represents that:

§ 2.1.1 The Bidder has read and understands the Bidding Documents or Contract Documents, to the extent that such documentation relates to the Work for which the Bid is submitted, and for other portions of the Project, if any, being bid concurrently or presently under construction.

§ 2.1.2 The Bid is made in compliance with the Bidding Documents.

§ 2.1.3 The Bidder has visited the site, become familiar with local conditions under which the Work is to be performed and has correlated the Bidder's personal observations with the requirements of the proposed Contract Documents.

§ 2.1.4 The Bid is based upon the materials, equipment and systems required by the Bidding Documents without exception.

## **ARTICLE 3 BIDDING DOCUMENTS**

### **§ 3.1 COPIES**

§ 3.1.1 Bidders may obtain complete sets of the Bidding Documents from the issuing office designated in the Advertisement or Invitation to Bid in the number and for the deposit sum, if any, stated therein. The deposit will be refunded to Bidders who submit a bona fide Bid and return the Bidding Documents in good condition within ten days after receipt of Bids. The cost of replacement of missing or damaged documents will be deducted from the deposit. A Bidder receiving a Contract award may retain the Bidding Documents and the Bidder's deposit will be refunded.



§ 3.1.2 Bidding Documents will not be issued directly to Sub-bidders unless specifically offered in the Advertisement or Invitation to Bid, or in supplementary instructions to bidders.

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

§ 3.1.4 The Owner and Architect may make copies of the Bidding Documents available on the above terms for the purpose of obtaining Bids on the Work. No license or grant of use is conferred by issuance of copies of the Bidding Documents.

### § 3.2 INTERPRETATION OR CORRECTION OF BIDDING DOCUMENTS

§ 3.2.1 The Bidder shall carefully study and compare the Bidding Documents with each other, and with other work being bid concurrently or presently under construction to the extent that it relates to the Work for which the Bid is submitted, shall examine the site and local conditions, and shall at once report to the Architect errors, inconsistencies or ambiguities discovered.

§ 3.2.2 Bidders and Sub-bidders requiring clarification or interpretation of the Bidding Documents shall make a written request which shall reach the Architect at least seven days prior to the date for receipt of Bids.

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

### § 3.3 SUBSTITUTIONS

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

§ 3.3.2 No substitution will be considered prior to receipt of Bids unless written request for approval has been received by the Architect at least ten days prior to the date for receipt of Bids. Such requests shall include the name of the material or equipment for which it is to be substituted and a complete description of the proposed substitution including drawings, performance and test data, and other information necessary for an evaluation. A statement setting forth changes in other materials, equipment or other portions of the Work, including changes in the work of other contracts that incorporation of the proposed substitution would require, shall be included. The burden of proof of the merit of the proposed substitution is upon the proposer. The Architect's decision of approval or disapproval of a proposed substitution shall be final.

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

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

### § 3.4 ADDENDA

§ 3.4.1 Addenda will be transmitted to all who are known by the issuing office to have received a complete set of Bidding Documents.

§ 3.4.2 Copies of Addenda will be made available for inspection wherever Bidding Documents are on file for that purpose.

§ 3.4.3 Addenda will be issued no later than four days prior to the date for receipt of Bids except an Addendum withdrawing the request for Bids or one which includes postponement of the date for receipt of Bids.

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

## **ARTICLE 4 BIDDING PROCEDURES**

### **§ 4.1 PREPARATION OF BIDS**

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

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

§ 4.1.3 Sums shall be expressed in both words and figures. In case of discrepancy, the amount written in words shall govern.

§ 4.1.4 Interlineations, alterations and erasures must be initialed by the signer of the Bid.

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

§ 4.1.6 Where two or more Bids for designated portions of the Work have been requested, the Bidder may, without forfeiture of the bid security, state the Bidder's refusal to accept award of less than the combination of Bids stipulated by the Bidder. The Bidder shall make no additional stipulations on the bid form nor qualify the Bid in any other manner.

§ 4.1.7 Each copy of the Bid shall state the legal name of the Bidder and the nature of legal form of the Bidder. The Bidder shall provide evidence of legal authority to perform within the jurisdiction of the Work. Each copy shall be signed by the person or persons legally authorized to bind the Bidder to a contract. A Bid by a corporation shall further give the state of incorporation and have the corporate seal affixed. A Bid submitted by an agent shall have a current power of attorney attached certifying the agent's authority to bind the Bidder.

### **§ 4.2 BID SECURITY**

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

§ 4.2.2 If a surety bond is required, it shall be written on AIA Document A310, Bid Bond, unless otherwise provided in the Bidding Documents, and the attorney-in-fact who executes the bond on behalf of the surety shall affix to the bond a certified and current copy of the power of attorney.

§ 4.2.3 The Owner will have the right to retain the bid security of Bidders to whom an award is being considered until either (a) the Contract has been executed and bonds, if required, have been furnished, or (b) the specified time has elapsed so that Bids may be withdrawn or (c) all Bids have been rejected.

### **§ 4.3 SUBMISSION OF BIDS**

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

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

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

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

### **§ 4.4 MODIFICATION OR WITHDRAWAL OF BID**

§ 4.4.1 A Bid may not be modified, withdrawn or canceled by the Bidder during the stipulated time period following the time and date designated for the receipt of Bids, and each Bidder so agrees in submitting a Bid.

§ 4.4.2 Prior to the time and date designated for receipt of Bids, a Bid submitted may be modified or withdrawn by notice to the party receiving Bids at the place designated for receipt of Bids. Such notice shall be in writing over the signature of the Bidder. Written confirmation over the signature of the Bidder shall be received, and date- and time-stamped by the receiving party on or before the date and time set for receipt of Bids. A change shall be so worded as not to reveal the amount of the original Bid.

§ 4.4.3 Withdrawn Bids may be resubmitted up to the date and time designated for the receipt of Bids provided that they are then fully in conformance with these Instructions to Bidders.

§ 4.4.4 Bid security, if required, shall be in an amount sufficient for the Bid as resubmitted.

## **ARTICLE 5 CONSIDERATION OF BIDS**

### **§ 5.1 OPENING OF BIDS**

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

### **§ 5.2 REJECTION OF BIDS**

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

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

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

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

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

### **§ 6.1 CONTRACTOR'S QUALIFICATION STATEMENT**

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

### **§ 6.2 OWNER'S FINANCIAL CAPABILITY**

The Owner shall, at the request of the Bidder to whom award of a Contract is under consideration and no later than seven days prior to the expiration of the time for withdrawal of Bids, furnish to the Bidder reasonable evidence that financial arrangements have been made to fulfill the Owner's obligations under the Contract. Unless such reasonable evidence is furnished, the Bidder will not be required to execute the Agreement between the Owner and Contractor.

### **§ 6.3 SUBMITTALS**

§ 6.3.1 The Bidder shall, as soon as practicable or as stipulated in the Bidding Documents, after notification of selection for the award of a Contract, furnish to the Owner through the Architect in writing:

- .1 a designation of the Work to be performed with the Bidder's own forces;
- .2 names of the manufacturers, products, and the suppliers of principal items or systems of materials and equipment proposed for the Work; and
- .3 names of persons or entities (including those who are to furnish materials or equipment fabricated to a special design) proposed for the principal portions of the Work.

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

§ 6.3.3 Prior to the execution of the Contract, the Architect will notify the Bidder in writing if either the Owner or Architect, after due investigation, has reasonable objection to a person or entity proposed by the Bidder. If the Owner or Architect has reasonable objection to a proposed person or entity, the Bidder may, at the Bidder's option, (1) withdraw the Bid or (2) submit an acceptable substitute person or entity with an adjustment in the Base Bid or Alternate Bid to cover the difference in cost occasioned by such substitution. The Owner may accept the adjusted bid price or disqualify the Bidder. In the event of either withdrawal or disqualification, bid security will not be forfeited.

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

## **ARTICLE 7 PERFORMANCE BOND AND PAYMENT BOND**

### **§ 7.1 BOND REQUIREMENTS**

§ 7.1.1 If stipulated in the Bidding Documents, the Bidder shall furnish bonds covering the faithful performance of the Contract and payment of all obligations arising thereunder. Bonds may be secured through the Bidder's usual sources.

§ 7.1.2 If the furnishing of such bonds is stipulated in the Bidding Documents, the cost shall be included in the Bid. If the furnishing of such bonds is required after receipt of bids and before execution of the Contract, the cost of such bonds shall be added to the Bid in determining the Contract Sum.

§ 7.1.3 If the Owner requires that bonds be secured from other than the Bidder's usual sources, changes in cost will be adjusted as provided in the Contract Documents.

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

§ 7.2.1 The Bidder shall deliver the required bonds to the Owner not later than three days following the date of execution of the Contract. If the Work is to be commenced prior thereto in response to a letter of intent, the Bidder shall, prior to commencement of the Work, submit evidence satisfactory to the Owner that such bonds will be furnished and delivered in accordance with this Section 7.2.1.

§ 7.2.2 Unless otherwise provided, the bonds shall be written on AIA Document A312, Performance Bond and Payment Bond. Both bonds shall be written in the amount of the Contract Sum.

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

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

## **ARTICLE 8 FORM OF AGREEMENT BETWEEN OWNER AND CONTRACTOR**

Unless otherwise required in the Bidding Documents, the Agreement for the Work will be written on AIA Document A101, Standard Form of Agreement Between Owner and Contractor Where the Basis of Payment Is a Stipulated Sum.

# **Additions and Deletions Report for** **AIA<sup>®</sup> Document A701<sup>™</sup> – 1997**

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

Note: This Additions and Deletions Report is provided for information purposes only and is not incorporated into or constitute any part of the associated AIA document. This Additions and Deletions Report and its associated document were generated simultaneously by AIA software at 17:15:14 on 02/17/2015.

**PAGE 1**

Blank AIA Documents

## **Certification of Document's Authenticity**

**AIA® Document D401™ – 2003**

I, \_\_\_\_\_, hereby certify, to the best of my knowledge, information and belief, that I created the attached final document simultaneously with its associated Additions and Deletions Report and this certification at 17:15:14 on 02/17/2015 under Order No. 2403580246\_1 from AIA Contract Documents software and that in preparing the attached final document I made no changes to the original text of AIA® Document A701™ – 1997, Instructions to Bidders, as published by the AIA in its software, other than those additions and deletions shown in the associated Additions and Deletions Report.

\_\_\_\_\_  
*(Signed)*

\_\_\_\_\_  
*(Title)*

\_\_\_\_\_  
*(Dated)*

**SUPPLEMENTARY INSTRUCTIONS TO BIDDERS**

**PART 1 GENERAL**

The following Supplementary Instructions to Bidders modify, change from or add to AIA Document A701 Instruction To Bidders, 1997 Edition. Where any Article of the Instructions to Bidders is modified or any paragraph, subparagraph, or clause thereof is modified or deleted by these Supplementary Instructions to Bidders, the unaltered provisions of that Article, paragraph, subparagraph, or clause shall remain in effect.

1.1 ARTICLE 2 BIDDER’S REPRESENTATIONS

A. Add the following subparagraphs to 2.1.3:

2.1.3.1 Bidders are required to attend any mandatory pre-bid conferences or tours as stated in the Advertisement for Bids. Bidders not attending this pre-bid conference and tour shall be disqualified from bidding. Bidders will be required to sign in at the project site prior to the conference or tour.

2.1.3.2 Bidders are encouraged to visit the site(s) to become familiar with existing conditions. The Owner is not responsible and shall not bear financial burden for oversights made by the Bidder for failure to inspect sites prior to submitting a bid.

2.1.3.3 In all cases, persons wishing to examine the area of work must sign in at the school office prior to visiting the work area. Prior to leaving the school, sign-out at the office is required.

2.1.3.4 If access is required at times when the school office is not staffed, contact the Facilities Office, 541-790-7417, for assistance.

B. Add the following paragraph 2.1.5:

2.1.5 The Bidder certifies by signing the Bid that the Bidder has a drug-testing program in place for its employees that includes, at a minimum, the following:

- .1 A written employee drug-testing program,
- .2 Required drug testing for all new Subject Employees, or alternatively, requiring testing of Subject Employees every six months on a random selection basis,
- .3 Required testing of a Subject Employee when the Contractor has reasonable cause to believe the Subject Employee is under the influence of drugs, and
- .4 Required testing of a Subject Employee when the Subject Employee is involved in: (I) an incident causing an injury requiring treatment by a physician, or (ii) an incident resulting in damage to property or equipment.

A drug-testing program that meets the above requirements will be deemed a “Qualifying Employee Drug-testing Program”. For purposes of this rule an employee is a “Subject Employee” only if that employee will be working on the Project job site; and

That if awarded the Public Improvement Contract, the Bidder will execute a contract in which the Contractor shall represent and warrant to the District that the Qualifying Employee Drug-testing Program is in place at the time of contract execution and will continue in full force and effect for the duration of the Public Improvement Contract; and that the Contract will condition the Agency’s performance obligation upon the Contractor’s compliance with this representation and warranty; and

That the Public Improvement Contract shall contain Contractor’s covenant requiring each subcontractor providing labor for the Project to:

- .1 Demonstrate to the Contractor that it has a Qualifying Employee Drug-testing Program for the subcontractor’s Subject Employees, and represent and warrant to the Contractor that the Qualifying Employee Drug-testing Program is in place at the time of subcontract execution and will continue in full force and effect for the duration of the subcontract; or
- .2 Require the subcontractor’s Subject Employees to participate in the Contractor’s Qualifying Employee Drug-testing Program for the duration of the subcontract.

## SUPPLEMENTARY INSTRUCTIONS TO BIDDERS – DOCUMENT 00 22 13

### 1.2 ARTICLE 3 BIDDING DOCUMENTS

#### A. 3.3 SUBSTITUTIONS

##### 1. Add the following:

3.3.2.1 All requests for approval must be submitted in duplicate on "Substitution Request Form". Include a self-addressed stamped envelope. Requests received by Architect less than ten (10) days prior to bid will not be considered.

#### B. 3.4 ADDENDA

##### 1. Delete paragraph 3.4.1 and substitute the following:

3.4.1 Addenda will be issued to plan centers listed in the Advertisement for Bids and all firms listed on the Planholder List and the 4J website.

### 1.3 ARTICLE 4 BIDDING PROCEDURES

#### A. 4.1 PREPARATION OF BIDS

##### 1. Add the following Paragraphs:

4.1.8 Bidders shall certify to non-collusion practices on the form included as part of the Bid Form, to be submitted with the Bid Form.

.1 A Non-Collusion Affidavit is required for any contract awarded pursuant to the bid. According to the Oregon Public Contracts and Purchasing Laws, a public contracting agency may reject any or all bids upon a finding of the agency that it is in the public interest to do so (ORS 279C.395). This agency finds that it is in the public interest to require the completion of this affidavit by potential contractors.

.2 The Non-Collusion Affidavit must be executed by the member, officer or employee of the bidder who makes the final decision on prices and the amount quoted in the bid.

.3 Bid rigging and other efforts to restrain competition, and the making of false sworn statements in connection with the submission of bids are unlawful and may be subject to criminal prosecution. The person who signs the Affidavit should examine it carefully before signing and assure himself or herself that each statement is true and accurate, making diligent inquiry, as necessary, of all other persons employed by or associated with the bidder with responsibilities for the preparation approval or submission of the bid.

.4 In the case of a bid submitted by a joint venture, each party to the venture must be identified in the bid documents, and an Affidavit must be submitted separately on behalf of each party.

.5 The term "complementary bid" as used in the Affidavit has the meaning commonly associated with the term in the bidding process, and includes the knowing submission of bids higher than the bid of another firm, any intentionally high or noncompetitive bid, and any other form of bid submitted for the purpose of giving a false appearance of competition.

.6 Failure to file an Affidavit in compliance with these instructions will result in disqualification of the bid.

4.1.9 Bidders shall certify to non-discrimination in employment practices on the form, included as part of the Bid Form, to be submitted with the Bid Form. By submitting its bid, the Bidder certifies conformance to the applicable federal acts, executive orders, and Oregon statutes and regulations concerning affirmative action toward equal employment opportunities. All information and reports required by the federal or Oregon state governments having responsibility for the enforcement of such laws shall be supplied to the Owner in compliance with such acts, regulation, and orders.

.1 Failure to file an Affidavit in compliance with these instructions will result in disqualification of the bid.

4.1.10 Bidder shall indicate, on the Bid Form where provided, the bidder's status as a "resident" or "non-resident" in accordance with ORS 279C.365 and ORS 279A.120.



**SUPPLEMENTARY INSTRUCTIONS TO BIDDERS – DOCUMENT 00 22 13**

4.1.11 First-Tier Subcontractor Disclosure:

.1 Within two working hours after the date and time of the deadline when the bids are due, a Bidder shall submit to the District a disclosure of the first-tier subcontractors that will be furnishing labor or will be furnishing labor and materials in connection with the public improvement; and will have a contract value that is equal to or greater than 5% of the project bid or \$15,000, whichever is greater, or \$350,000, regardless of the percentage of the total project bid.

.2 The disclosure of first-tier subcontractors shall include the name of each subcontractor, the category of work that the subcontractor would be performing, and the dollar value of each subcontract.

.3 The first-tier subcontractor disclosure applies only to public improvements with a contract value of more than \$100,000.

.4 The District will consider the bid of any contractor that does not submit a required subcontractor disclosure to the District to be a non-responsive bid. A non-responsive Bid will not be considered for Award.

.5 Contractor shall certify that all subcontractors performing Work are registered with the Construction Contractors Board or licensed by the State Landscape Contractors Board in accordance with ORS 701.035 to 701.055 before the subcontractors commence work under the Contract.

**B. 4.2 BID SECURITY**

1. Delete paragraphs 4.2.2 and 4.2.3 and substitute the following:

4.2.2 Each Bid shall be accompanied by a surety bond, cashiers check, or certified check, executed in favor of Eugene School District 4J, in the amount not less than ten percent (10%) of the total bid, based upon the total bid amount for those items bid upon. Should the Bidder refuse to enter into such Contract or fail to furnish Performance and Labor and Materials Payment Bonds and Certificates of Insurance as required by the Supplementary Conditions within ten (10) working days after contract forms are provided to the Bidder, the amount of the Bid Security may be forfeited to the Owner as liquidated damages, not as a penalty.

.1 The Surety Bond shall be written by a Bonding Company authorized and licensed by the Oregon Insurance Commissioner. The bonding company must be listed on the most current US Government Treasury List, Department Circular 570, or approved PRIOR TO BID SUBMISSION by the Eugene School District 4J's Risk Manager. The Bond shall be on a AIA Document A310, most current edition. The Attorney-in-Fact who executes the Bond on behalf of the Surety shall affix to the Bond, a certified copy of a power of attorney.

.2 The Owner will have the right to retain the Bid Security of Bidders until either; a) the Contract has been executed and Bonds have been furnished, or b) the specified time has elapsed so that Bids may be withdrawn, or c) all Bids have been rejected.

**C. 4.4 MODIFICATION OR WITHDRAWAL OF BID**

1. Delete paragraph 4.4.1 and substitute the following:

4.4.1 A Bid may not be withdrawn or canceled by the Bidder following the time and date designated for the receipt of bids to the expiration of a 60 day period. The Bid for that sixty days is irrevocable and each Bidder so agrees in submitting a Bid.

**1.4 ARTICLE 6 POST-BID INFORMATION**

A. Delete Paragraph 6.1.

B. Modify paragraph 6.3.1 as follows:

In the first sentence delete the phrase "as soon as practicable" and add "within 48 hours."

C. Add the following:

6.3.1.4 Where asbestos abatement is required, Contractor or appropriate subcontractor shall be licensed by the Department of Environmental Quality to perform "asbestos abatement work", per OAR 340-248-0120,

**SUPPLEMENTARY INSTRUCTIONS TO BIDDERS – DOCUMENT 00 22 13**

Adopted 1/25/90, and meet requirements of AHERA as specified in the Federal Register, 40 CFR part 763. Bidder shall submit evidence of licensing to Owner.

**1.5 ARTICLE 7 PERFORMANCE BOND AND PAYMENT BOND**

**A. 7.1 BOND REQUIREMENTS**

1. Delete paragraphs 7.1.1, 7.1.2 and 7.1.3 and add the following:

7.1.1 Unless otherwise stated in the solicitation document, prior to execution of the Agreement, the successful Bidder shall furnish a separate Performance Bond and a Labor Bond and Materials Payment Bond that in all respects conform to the requirements of ORS 279C.380 covering faithful performance of the Contract, and the payment of all obligations arising thereunder, each in an amount equal to one hundred percent (100%) of the Contract sum. The duration of the performance bond shall match the length of the project warranty.

7.1.2 Bonds shall be submitted on AIA Document A312, latest edition.

7.1.3 The surety issuing such bonds shall be duly authorized and licensed to issue bonds in the State of Oregon. The bonds shall be executed by an attorney-in-fact, principal or other authorized representative for the surety company, showing the Oregon agent for service, and bears the seal of the surety company. Where the bond is executed by a person outside the state of Oregon, his authority to execute bonds shall be shown. The Bonds shall be fully executed, payable to the Owner.

7.1.4 The cost of furnishing such bonds shall be included in the Bid.

**B. BOLI Public Works Bond:**

1. Add the following:

Pursuant to ORS 279C.836, for any contract awarded where the contract price is \$100,000.00 or greater, the Contractor and every subcontractor shall have a Public Works bond filed with the Construction Contractors Board before starting work on the project. This bond is in addition to performance bond and payment bond requirements. A copy of the Contractor’s BOLI Public Works Bond shall be provided with the executed contract.

**1.2 TIME OF DELIVERY AND FORM OF BONDS**

A. Delete paragraph 7.2.1 and substitute the following:

7.2.1 The successful Bidder will be provided with contract forms through the Architect. These forms shall be executed and delivered to the Owner, along with Performance Bond and Labor and Material Payment Bond, within ten (10) days after receiving forms.

B. Add the following article:

**ARTICLE 9 MISCELLANEOUS PROVISIONS**

**9.1 ADMINISTRATIVE RULES**

All bidders are required to comply with the provisions of Oregon Revised Statutes and 4J Board Policy. Attention is directed to ORS 244, Government Ethics; ORS 279A and 279C, Public Contracting Code; Oregon Administrative Rules, Chapter 137, Divisions 46, 48 and 49; and 4J Board Policy DJC.

**9.2 PROTEST OF BID**

Protests of bid specifications or contract terms shall be presented to the Owner in writing five (5) calendar days prior to bid opening. Such protest or request for change shall include the reason for protest or request, and any proposed changes to specifications or terms. No protest against award because of the content of bid specifications or contract terms shall be considered after the deadline established for submitting such protest.

**9.3 PROTEST OF AWARD**

Any actual bidder or proposer who is adversely affected by the Owner's notice of award of the contract to another bidder or proposer on the same solicitation shall have seventy two (72) hours from the notice of award to submit to the Owner, a written protest of the notice of award. In order to be an adversely affected or aggrieved bidder or proposer with a right to submit a written protest, a bidder or proposer must itself claim to

**SUPPLEMENTARY INSTRUCTIONS TO BIDDERS – DOCUMENT 00 22 13**

be eligible for award of the contract as the lowest responsible bidder or best proposer and must be next in line for award.

**9.4 FINAL AWARD**

The written notice of award of the contract shall constitute a final decision of the Owner to award the contract if no written protest of the notice of award is filed with the Owner within the designated time.

**END OF DOCUMENT 00 22 13**

**AVAILABLE PROJECT INFORMATION**

**PART 1 GENERAL**

**1.01 EXISTING CONDITIONS**

- A. Certain information relating to existing surface and subsurface conditions and structures is available to bidders but will not be part of the Contract Documents, as follows:

**1.02 SUBSURFACE INVESTIGATION REPORT**

- A. A copy of the geotechnical reports with respect to the building site is included with this document:
  - 1. Title: Geotechnical Investigation, Roosevelt Middle School, Eugene, Oregon.
  - 2. Date: April 23, 2014.
  - 3. Prepared by: Foundation Engineering, Inc.
- B. View at the office of Owner.
- C. These reports identifies properties of below grade conditions and offers recommendations for the design of foundations, prepared primarily for the use of Architect.
- D. The recommendations described shall not be construed as a requirement of this Contract, unless specifically referenced in the Contract Documents.
- E. These reports, by there nature, cannot reveal all conditions that exist on the site. Should subsurface conditions be found to vary substantially from this report, changes in the design and construction of foundations will be made, with resulting credits or expenditures to the Contract Price accruing to Owner.

**1.03 TOPOGRAPHIC SURVEY**

- A. Copies of topographic surveys with respect to each project site are included in Drawings set:
  - 1. Title: Topographic Survey for 4-J School District, Roosevelt Middle School.
  - 2. Date: February 12, 2014
  - 3. Prepared by: Branch Engineering, Inc.
- B. The survey identifies grade elevations prepared primarily for the use of Architect in establishing new grades and identifying natural water shed.
- C. The survey identifies existing buildings, structures, utilities, infrastructure, and established trees and vegetation.

**1.04 EXISTING CONDITIONS SURVEY**

- A. Copies of surveys with respect to the conditions of the existing construction are available for viewing.
- B. View at the office of Owner.
- C. These surveys identify hazardous materials in existing construction prepared primarily for the use of the Owner in establishing the extent of hazardous material abatement work under separate contract.

**PART 2 PRODUCTS (NOT USED)**

**PART 3 EXECUTION (NOT USED)**

**END OF INFORMATION AVAILABLE TO BIDDERS**



# Geotechnical Investigation

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**Roosevelt Middle School**

**Eugene, Oregon**

**Prepared for:**

**Lane County School District 4J  
Eugene, Oregon**

**April 23, 2014**

*Professional  
Geotechnical  
Services*

---

**Foundation Engineering, Inc.**



Kirk Gebb, Project Manager  
Eugene Public Schools  
Lane County School District 4J  
715 West 4<sup>th</sup> Avenue  
Eugene, Oregon 97402

April 23, 2014

**Roosevelt Middle School  
Geotechnical Investigation and Seismic Hazard Study  
Eugene, Oregon**

**Project 2141017**

Dear Mr. Gebb:

We have completed the requested geotechnical investigation for the replacement of Roosevelt School in Eugene, Oregon. Our report includes a description of our work, a discussion of site and subsurface conditions, a summary of laboratory and field testing and a discussion of key geotechnical issues pertaining to the proposed project. Recommendations for site preparation, foundation design and construction, and pavements are also provided. Our report also includes a site-specific seismic hazard study that is intended to meet current Oregon Structural Specialty Code (OSSC) requirements.

It has been a pleasure assisting you with this phase of your project. Please do not hesitate to contact us if you have any questions or if you require further assistance.

Sincerely,

FOUNDATION ENGINEERING, INC.

Matthew D. Mason  
Geotechnical staff

James K. Maitland, P.E., G.E.  
Principal

MDM/JKM/zc  
enclosure



**GEOTECHNICAL INVESTIGATION AND SEISMIC HAZARD STUDY  
ROOSEVELT MIDDLE SCHOOL  
EUGENE, OREGON**

**BACKGROUND**

Lane County School District 4J plans to replace Roosevelt Middle School located at 680 E 24<sup>th</sup> Avenue in Eugene, Oregon. The location is shown on Figure 1A (Appendix A). Foundation Engineering, Inc. (FEI) completed a preliminary investigation for the project in 2004. At that time the school district was considering options of building over the footprint of the existing school or in the soccer fields to the west. Current plans include an option of moving the footprint of the new school further west, to include the existing tennis courts and the area to the south. The architect indicated the replacement facility will be a two-story structure with an estimated gross floor area of  $\pm 98,000$  SF. The existing school building will be demolished and replaced by play fields and tennis courts.

The purpose of this investigation is to provide supplemental subsurface information in areas not previously explored and recommendations for foundation design and construction. For the sake of completeness, the boring logs, description of subsurface conditions and laboratory test results from the previous investigation are included in this report.

Mahlum is the project architect and Robertson Sherwood Architects pc (RSA) is the associate architect. KPFF Consulting Engineers (KPFF) is the structural consultant. Foundation Engineering, Inc. (FEI) was retained by the school district as the geotechnical consultant. Our scope of work was outlined in a proposal dated February 17, 2014, and authorized by a contract dated February 19, 2014.

**LOCAL GEOLOGY**

Detailed discussions of the regional geology, tectonic setting, local faulting and historical seismicity are presented in the Seismic Hazard Study (Appendix E). An abbreviated discussion of local geology is provided below.

The project site is located within the southern Willamette Valley, near Amazon Creek in South Eugene. The project area is situated on a relatively flat alluvial plain (Yeats et al., 1996). Geologic mapping and previous explorations suggest that the project site is underlain by Pleistocene-age (<1.8 million years old), fan-delta alluvium (Madin and Murray, 2006; McClaughry et al., 2010). These alluvial deposits consist of silt to boulder-size material that was primarily deposited by the McKenzie and Willamette Rivers (Yeats et al., 1996; Orr and Orr, 1999; O'Connor et al., 2001; Madin and Murray, 2006). However, no particles larger than gravel-size were observed during our explorations.

The fan-delta alluvial deposits were deposited on top of the Eugene Formation (Madin and Murray, 2006; McClaughry et al., 2010). The Eugene Formation (early Oligocene to late Eocene,  $\pm 30$  to 40 million years old) is comprised of marine tuffaceous sandstone and siltstone (Yeats et al., 1996; Madin and Murray, 2006). The formation outcrops in the Coburg Hills,  $\pm 5$  miles northeast of the site, where it is estimated to be  $\pm 1,800$  feet thick (Yeats et al., 1996).

The mapped local geology is consistent with the subsurface conditions encountered in our current and previous explorations. Details of the conditions encountered in the borings are provided in the Subsurface Conditions section below.

## **FIELD EXPLORATION**

### **Previous Drilling**

FEI drilled six exploratory boreholes (BH-1 through BH-6) at site during the preliminary geotechnical investigation in 2004. The approximate borehole locations are shown on Figure 2A (Appendix A) and the final logs for all borings are included in Appendix B.

### **Current Exploration**

We drilled three supplemental exploratory boreholes (BH-7 through BH-9) at the site between February 24 and 25, 2013, using a CME-75, track-mounted drill rig using mud rotary drilling and HQ wire-line coring techniques. The borings were located in consultation with the school district to establish overall subsurface conditions in the grass areas west of the soccer fields. The approximate borehole locations are shown on Figure 2A (Appendix A).

The supplemental boreholes extended to maximum depth of  $\pm 30$  feet. Samples were typically obtained at 2.5-foot intervals to  $\pm 5$  feet below the bedrock surface, and at 5-foot intervals thereafter. Disturbed samples were obtained with a split-spoon sampler. The Standard Penetration Test (SPT), which is run when the split-spoon is driven, provides an indication of the relative stiffness or density of the soils and rock hardness. Relatively undisturbed Shelby tube samples were obtained at select locations. HQ-size, wire-line coring was completed in BH-8 to obtain rock core samples for laboratory testing.

The boreholes were continually logged during drilling. The final logs (Appendix B) were prepared based on a review of the field logs, an examination of the soil samples in our office, and laboratory test results. The subsurface conditions are discussed below.



## DISCUSSION OF SITE CONDITIONS

### Site Topography and Vegetation

The overall site is relatively flat and is occupied by the existing school to the east, soccer fields in the middle and tennis courts and grass areas to the west. A topographic site plan prepared by Branch Engineering indicates the ground surface within this portion of the site ranges from  $\pm$ El. 427 to the west and rises to  $\pm$ El. 429 in the center of the soccer fields and descends to  $\pm$ El. 428 along the eastern limits of the soccer fields. Vegetation is limited to short grass in the soccer fields and in the open areas to the north and south of the tennis courts. Trees border the site to the west along Amazon Creek.

### Subsurface Conditions

Exploratory drilling within the soccer fields and lawn areas typically encountered sod and topsoil at the ground surface. Hand sampling indicates that the sod and topsoil typically range from  $\pm$ 3 to 12 inches. Drilling through the courtyard (BH-6) encountered  $\pm$ 3 inches of asphaltic concrete. The soil profile underlying the topsoil and pavements typically included the following soil units:

- possible fill
- alluvium
- sandstone

Possible fill: A  $\pm$ 4 to 5-foot thick layer of brown, moist, medium to high plasticity silty clay was encountered in most of the borings completed east of the tennis courts (with the exception of BH-6). This material was damp to moist and medium stiff to stiff at the time of our exploration. Iron-staining was observed to varying degrees, depending on location. Traces of sand and occasional scattered fine gravel were noted in this layer, suggesting that the soil is fill. However, the appearance of the fill was very similar to that of the underlying soil and the depth of contact is not well established. Fill was not encountered in the borings completed in the western side of the site (BH-7, BH-8 and BH-9).

Alluvium: Fine-grained alluvium was encountered in all borings. In most of the borings, with the exception of BH-6, the alluvium consists of high plasticity clay. The Atterberg Limits tests indicated classifications that fell on the A-line or slightly above or below it. For the sake of simplicity a classification of CH was assumed for all of the soil. The clay was moist to wet and medium stiff to stiff at the time of our exploration. The thickness of the alluvial clay ranges from  $\pm$ 5.5 to 9.5 feet. Medium dense to dense sand with variable clay content extends beneath clay to  $\pm$ 12 to 16 feet in all the borings except BH-4, BH-6 and BH-9.

Sandstone: Sandstone (Eugene Formation) was encountered in all borings at depths of  $\pm$ 11.5 to 16 feet below the ground surface. At the surface of the formation, the sandstone is grey, iron-stained, highly weathered and is extremely soft (R0). The sandstone grades to slightly weathered to fresh with depth. Laboratory tests

(see below) on cores from BH-8 from  $\pm 18$  to 22 feet indicated rock strengths that are within the lower range of soft rock (R2). Therefore, we have shown the sandstone grading to a soft rock (R2) within a few feet of the bedrock surface.

### **Ground Water**

Mud-rotary drilling techniques precluded an accurate ground water measurement. However, the observed iron-staining of the surficial soils and the presence of high plastic clay suggest that a perched water condition develops within a few feet of the ground surface during wet portions of the year. In addition, the iron-staining of the residual soil underlying the plastic clay suggests ground water typically rises to within  $\pm 6$  to 13 feet of the ground surface during the winter.

## **LABORATORY AND FIELD TESTING**

### **Laboratory Tests**

Previous testing completed for the preliminary investigation included natural water content, Atterberg limits, and confined swell tests. Results of the index and confined swell tests are summarized in Table 1C and Table 2C (Appendix C), respectively. Additional index tests were run on samples obtained from the supplemental borings. Those test results are also included in Table 1C.

The Atterberg limits indicate Plasticity Indices (PI) of 27 to 44 and a Liquid Limit (LL) of 55 to 81 for the surficial soil). These limits correspond to a medium to high plasticity silty clay to clayey silt and Unified Soil Classification System (USCS) classifications of MH, MH-CH and CH. Atterberg limits testing on the deeper clay indicates the soil has PI values of 36 to 52 and LL of 59 to 83. These limits correspond to a high plasticity clay and a USCS classification of CH.

Unconfined compression tests were also completed on two bedrock samples to estimate the rock's strength for pile analysis. Results of these tests are summarized in Table 3C (Appendix C).

A one-dimensional consolidation test was run on a selected sample of the plastic clay. Results of the consolidation test are shown in Figure 1C (Appendix C). At the beginning of the test, the specimen was allowed to swell under a minimal seating pressure of 100 psf. Under that pressure, the specimen swelled  $\pm 0.2\%$  due to saturation.

### **Resistivity and pH Testing**

In-situ resistivity tests were completed near BH-1 and BH-8. The tests were using a Nilsson 400, 4-pin, soil resistance meter (ASTM G57). The approximate location of the resistivity tests are shown on Figures 2A (Appendix A).

The 4-pin resistance meter provides an estimate of the average resistivity of a soil profile extending to a depth equal to the spacing between the pins. The tests were performed with the pins spaced between  $\pm 4$  to 10 feet. The resistivity values, summarized in Table 4C (Appendix C), ranged from  $\pm 785$  to 1,532 ohm-cm. The test results are in the typical range for clay.

Laboratory pH tests were also run on selected soil samples (ASTM G51). Those test results are summarized in Table 5C and indicate pH values ranging from 6.4 to 6.7 (i.e., slightly acidic to neutral).

## **SEISMIC DESIGN**

A detailed, site-specific seismic hazard study was completed for the project and the findings are summarized in Appendix E. The Seismic Hazard Study concluded there are no seismic hazards that would preclude construction of the proposed building, or require site mitigation or special foundation consideration.

Seismic parameters that apply to structural design are provided below. The parameters were established according to the 2012 International Building Code (IBC), which is based on ASCE 7-10 (IBC, 2012). The current 2010 Oregon Structural Specialty Code (OSSC, 2010) is set to be replaced by OSSC 2014 on July 1, 2014. Therefore, the design team requested we provide seismic parameters according to IBC 2012 which will be incorporated into OSSC 2014.

### **Site Response Spectrum**

The site is underlain by predominantly stiff soils over relatively shallow bedrock. The upper soil contains a relatively thick deposit of high plasticity clay. As discussed in a subsequent section of this report, to mitigate the presence of the high plasticity clay, the building will be either supported by piles driven through the clay and into sandstone or several feet of the upper high plasticity clay will be removed and replaced with crushed rock and the building will be supported on conventional spread footings. Based on the presence of stiff soils and shallow bedrock, a Site Class C (very dense soil and soft rock) is recommended for seismic design.

The current OSSC (2010) is based on the 2009 International Building Code (IBC, 2009). The design maximum considered earthquake ground motion maps provided in OSSC 2010 are based on the 2002 maps prepared by USGS for an earthquake with a 2% probability of exceedence in 50 years (i.e., a  $\pm 2,475$ -year return period).

The upcoming OSSC 2014 will be based on the IBC 2012, which uses modified USGS 2008 maps with a 1% probability of exceedence in 50 years (i.e., a  $\pm 4,975$ -year return period) for design spectral accelerations. The modifications include factors to adjust the spectral accelerations to account for directivity and risk.

We understand the building will be designed based on IBC 2012. The IBC 2012 site response spectrum and seismic design parameters are shown on Figure 3A (Appendix A). For comparison, we have also included a site response spectrum and seismic design parameters based on IBC 2009/OSSC 2010 on Figure 3A.

### **Liquefaction Hazard**

Liquefiable soils typically consist of saturated, loose sand and non-plastic silt. The site is underlain by  $\pm 11\frac{1}{2}$  to 16 feet of predominately stiff, high plasticity clay underlain by bedrock. The clay is not susceptible to liquefaction due to its plasticity and stiffness. Therefore, the risk of liquefaction-induced bearing capacity failure, ground settlement and lateral spreading is negligible.

### **DISCUSSION OF KEY GEOTECHNICAL ISSUES**

We observed several geotechnical issues that should be addressed during design and/or construction. It should be understood that foundation construction and/or site mitigation will be most economical if completed during the summer months (July to September) when the site is drier and ground water can be more easily managed. Site preparation during the early spring, fall or winter (when the subgrade is wet) will substantially increase earthwork costs.

### **Site Drainage**

The observed iron-staining of the surficial soils and the presence of shallow high plasticity clay suggest that rainfall perches on the clay and collects within the soils in the upper  $\pm 2$  to 4 feet of the profile during the wet portion of the year. Recent drilling encountered wet, very soft surficial soils in the vicinity of the tennis courts. We anticipate that ground water levels can rise to within  $\pm 6$  to 13 feet of the ground surface.

We recommend raising the building areas at least  $\pm 1$  foot above the current site grades to promote positive drainage away from the new structures. Perimeter-footing drains will be required for all buildings to reduce the risk of moisture fluctuation in the plastic clay. We have assumed no below-grade construction is planned. Otherwise, the potential for perched water conditions would require drainage of any deep vaults or below-grade structures. We anticipate that design pavement grades will be set at or above existing grades.

### **Plastic Clay**

High plasticity clay (both fill and native) was observed in all of the borings. Because the stiffness and plasticity of the possible surficial fill and the underlying native soil are similar, the discussion below concerning their properties is applicable to all materials within  $\pm 9\frac{1}{2}$  to 13 feet of the ground surface.

Atterberg limits testing on samples indicate a liquid limit (LL) as high as 81, a plasticity index (PI) as high as 54, and a consistent USCS classification of CH. Such soils typically have high potential to shrink and swell with seasonal changes in moisture content. Shrinkage or swelling of the subgrade could cause cracking and distress in slabs, foundations and structures if not properly mitigated. Due to the thickness and depth of the clay (i.e., typically extending to depths of  $\pm 6$  to 14 feet below existing grades), we expect that complete removal and replacement of the clay with imported material will be impractical. However, partial replacement of the clay appears to be a viable option (see discussion below).

Previously run confined swell tests indicated surprisingly little swelling due to long-term saturation. Only one of the samples swelled (0.8%), while the remaining three consolidated slightly ( $\pm 0.5$  to 1.6%). Initial water contents ranged from 27% to 48%. The modest gain in moisture or loss of moisture during  $\pm 3$  to 5½ weeks of saturation are likely due to the extremely low permeability of the clay or consolidation under the confining pressure. It should also be noted that the only sample that swelled had a relatively low natural water content (27.4%), while the clays with high water contents consolidated. These tests suggest that the clay has a minor expansion potential at its present water content and confined with  $\pm 600$  psf.

The recently completed consolidation test indicated  $\pm 0.2\%$  swell under a seating pressure of  $\pm 100$  psf. This value is consistent with the results of previous swell tests.

From this information, we have concluded most of the potential swelling of the clays could be confined by adding several feet of granular site fill or by removing the upper clay and replacing it with several feet of granular site fill.

It is important to note that the potential for expansion would increase significantly if the clays were first allowed to dry (e.g., by exposure to the air) and were subsequently saturated. Therefore, it is critical that no plastic clay be left open to dry before being covered by granular fill.

### **Discussion of Foundation Options**

In our preliminary geotechnical study we discussed the following foundation options:

- Conventional foundations
- Conventional foundations with a raised site
- Conventional foundations with full overexcavation
- Deep foundations
- Conventional foundations with partial overexcavation

Conventional foundations (i.e., slab-on-grade and shallow footings) were considered too risky due to the potential distress from expansive soils. Therefore, this option was not considered further.

The option of raising the site grade with several feet of granular fill (to help contain the potential soil expansion) was previously discussed with the design team and deemed not feasible.

Complete mitigation of the expansive soils by full overexcavation does not appear to be cost-effective based on the depth of the plastic clays. Therefore, this option was not considered further.

Deep foundations could be used to bypass the high plastic clay and transfer foundation loads to the underlying sandstone. Driven or cast-in-place piles could be used for this site. We anticipate that driven steel piles would be more cost effective and quicker to install. In addition, pile-driving contractors are available locally.

We were also asked to consider rammed aggregate piers (e.g., Geopiers) for this site. It is our opinion that these foundation systems are not appropriate for the site since improvement of soft/compressible soils is not the critical issue, and aggregate-filled piers would not mitigate the potential for soil expansion. In fact the presence of relatively permeable rock columns could possibly exacerbate the expansion problem by introducing perched ground water into the deeper clays.

Piles are typically used where near-surface soils are too weak and/or compressible to sustain required foundation loads without excessive settlement or bearing capacity failure. At the Roosevelt Middle School site, the foundation soils are typically stiff and settlement and bearing capacity are not the primary geotechnical concerns. For this option, column loads would be carried by piles. The piles will provide axial and uplift capacity to resist seasonal movement of the building frame. It is assumed that a structural floor and grade beams would be used throughout the school with a gap left between the bottom of the slab and ground to allow for seasonal shrinkage and swelling. This system would essentially eliminate the potential problems associated with soil shrinkage or swelling and is appropriate if a low risk or no risk solution is needed.

The final option considered would consist of partial overexcavation of expansive soil within the entire building footprint to a depth of  $\pm 4$  to 5 feet. The bottom of the excavation would be graded to drain to the outside perimeter, where the moisture would be collected by a permanent drainage system. The excavated surface would be covered with a vapor barrier to slow or reduce changes in moisture due to water infiltrating through or accumulating in the building pad fill. Granular fill (gravel and/or rock) would be used to replace the excavated material. Although plastic clays would remain below the fill, the fluctuations in seasonal moisture content should be relatively minor at depths of  $\pm 4$  to 5 feet. Reinforcement of the concrete floor slab would further reduce the risk of cracking, heaving and faulting of the slab.

Partial overexcavation represents an attempt to balance the risk of movement due to expansive soil and the cost of a deep foundation system. There would still be some risk of soil movement of the clays underlying the building pad fill. However, with the drainage improvements described above and reinforcement of the slab, we

believe that the soil movement, if any, should be modest and possible distress would be limited to cosmetic cracking of floors and foundations.

The results of the swell tests suggest that potential heave of foundations would likely be limited to  $\pm \frac{3}{4}$  inch if the clays are excavated to a depth of  $\pm 4$  to 5 feet and replaced with compacted granular fill. Potential long-term consolidation of the underlying clays (due to the weight of the site fill) should be modest ( $\pm \frac{1}{2}$  inch). The estimated potential heave or settlement are within the tolerances of  $\pm \frac{1}{2}$  inch (maximum differential movement) and 1 inch (total movement) provided by the structural consultant. These estimates suggest that foundation settlements and/or heave could be managed with prudent site preparation and foundation design.

Recommendations for design and construction of both options are provided in this report.

## **ENGINEERING ANALYSIS**

### **Conventional Foundation Option**

**Bearing Capacity.** For the partial mitigation option, we have assumed the finished floor (FF) would extend at least 1 foot above existing grades and  $\pm 4$  feet of clay would be replaced with compacted granular fill. As a result, spread footings or continuous wall footings would typically be underlain by  $\pm 3$  feet of structural fill (assuming their base would extend  $\pm 2$  feet below FF). Therefore, a presumptive value of 2.5 ksf could be used as an allowable bearing capacity for footing design. Kpff estimated minimum and maximum column loads of 40 kips and 200 kips, respectively. The loads result in footing dimensions of between 4x4 feet and 9x9 feet. Similarly for the maximum wall load of 6 kips per foot, we estimate a continuous wall footing width of 2 feet.

**Settlement.** Potential foundation settlements were estimated using the assumed range of footing dimensions and the estimated maximum foundation loads provided by kpf. Kpff indicated a 65%:35% ratio of dead to live loads could be assumed. For settlement analysis we included the dead load and half of the estimated live load, resulting in a maximum column load of  $\pm 165$  kips and maximum wall load of  $\pm 5$  klf.

An average subsurface profile, representing a compilation of the boring information, was used to model foundation conditions. Results of the consolidation test (Figure 1C, Appendix C) were used to estimate the compressibility of the clay that will remain after site mitigation. The results from the consolidation test indicate the clay has an overconsolidation ratio (OCR) of  $\pm 2$  suggesting the clay is slightly overconsolidated. Consequently, the clay is sensitive to large consolidation settlement if the clay stratum experiences stresses greater than the preconsolidation stress in the layer. In our model, we increased the preconsolidation stress with depth to reflect the increase in stiffness and reduction in moisture content in the deeper portion of the clay stratum.

Our analysis indicates total settlement under the largest column loads should be less than  $\pm 1$  inch. Total settlement of a 2 to 3-foot wide continuous wall footing is estimated to be less than  $\pm \frac{1}{4}$  inch for the maximum wall load. For design, we recommend assuming a maximum differential settlement of  $\pm \frac{1}{2}$  inch between the columns or between the columns and perimeter walls.

We estimated the potential swell of the clay remaining beneath the building pad fill using the results of previous swell tests and the recent consolidation test. At least 4 feet of clay was assumed to have been removed and replaced with granular fill. Our analysis indicates the maximum potential swell would be  $\pm \frac{3}{4}$  inch, assuming saturation of the entire clay column. However, it is highly unlikely that the entire clay column would become saturated due to its low permeability. Furthermore, the presence of several feet of compacted granular fill will help resist differential soil movement. As a result, differential heave is likely to be well below the estimated total heave of  $\pm \frac{3}{4}$  inch.

The structural consultant recommended assuming settlements of 1 and  $\frac{1}{2}$  inch, as targets for tolerable total and differential settlements, respectively. Therefore, the estimated settlement and potential heave of the foundations (after the proposed site mitigation is completed) should comply with these target values.

### **Pile Foundation Option**

**Foundation Layout and Design Loads.** The pile layout and final design loads were not available at the time this report was written. For preliminary analysis, kpff estimated a maximum column load of 200 kips and a maximum wall load of 6 kips/lf. The analysis discussed below may have to be refined once better estimates of foundation loads are available.

**Axial Capacity.** We estimated the axial capacity for driven pipe pile. PP12.75x0.375 ASTM A252, Grade 3 sections were selected since they are readily available.

The soil profile at the site is relatively uniform and typically consists of  $\pm 12$  to 16 feet of fine-grained soil over sandstone. The drilling experienced practical sampling refusal (i.e., SPT (N) values  $> 100$ ) consistently within the sandstone. The two laboratory tests on the rock specimens indicated unconfined compressive strengths of  $\pm 1,250$  to 2,300 psi. For this rock strength, we assume the piles will develop their required capacity relatively quickly, with limited penetration into the sandstone.

Axial analysis was conducted using an average soil profiles based on the borings completed near the anticipated building footprint (i.e., BH-1 through BH-3, and BH-7 through BH-9). We have assumed the piles will be driven open-ended to limit the penetration into the sandstone. Therefore, we conducted our analysis assuming the axial capacity of the pile will be developed by predominantly end-bearing. The ultimate capacity of the pile section was calculated as a function of depth of embedment for the soil profile. Results of this analysis are shown on Figure 1D (Appendix D). We calculated the allowable axial capacity by dividing the



ultimate capacity by a factor of safety of 2.5, assuming wave equation is used to establish ultimate capacity at end of driving.

Based on wave equation analysis (discussed below) it was determined the ultimate capacity per pile is 250 kips and the allowable capacity is 100 kips, assuming a factor of safety of 2.5. Assuming the building columns are supported by at least two piles, PP12.75x0.375 sections provide the required capacity for the maximum column loads.

We expect that the required capacity will be obtained with  $\pm 2$  to 3 feet of embedment into the sandstone. This penetration should be confirmed in the field using at least three test piles, prior to cutting or ordering the bulk of the production piles. We estimated a nominal pile length of  $\pm 20$  feet (to provide several feet of stick up for pile driving). This length should be modified based on the results of the recommended test piles.

*Uplift Capacity.* Uplift capacities were based on skin friction developed within the overburden, assuming minimum penetration into the sandstone. For design, we recommend assuming an ultimate uplift capacity of 38 kips per pile based on the estimated skin friction mobilized in the overburden above the minimum tip elevation. An allowable uplift capacity of 13 kips per pile is recommended for sustained uplift loads, assuming a factor of safety of 3.

*Pile Settlement.* The piles will be driven to end-bearing in sandstone which is relatively incompressible. Consequently, pile settlement is expected to be negligible and limited to the elastic compression of the piles under the foundation loads.

*Lateral Capacity.* Lateral loads were not available at the time this report was prepared. In consultation with the structural designer, we assumed lateral loads ranging from 2 to 10 kips. Lateral pile analysis was completed using the computer program LPILE 6. A fixed-head condition was assumed for piles embedded into grade beams. The plot of deflection versus embedment depth for the respective load case is provided in Appendix D. Table 1D (Appendix D) summarizes the soil parameters used in the analysis. These parameters should be used for any additional LPILE analysis.

Pile layout and pile spacing were unavailable at the time this report was prepared. Prior to final design, we recommend group effects for closely spaced piles be considered using the p-y reduction factors shown in Table 2D (Appendix D).

*Driving Criteria and Driveability Analysis.* Wave equation analysis was completed using WEAP 2005 software to determine a range of hammer field energies required to drive the piles to an ultimate axial capacity of 250 kips with a final driving resistance in the range of 3 to 15 blows per inch. The parameters used in the analysis are summarized in Table 3D (Appendix D). The results of the analysis indicate a rated hammer field energy in the range of 5 ft-kips to 17 ft-kips will be required. It should be noted that pile hammers with energies in the lower range may not be efficient to drive the piles to the required capacity (i.e., they will require a high blow count). The actual required final driving resistances should be

established using wave equation analysis after the pile hammer information is submitted by the contractor. FEI should be retained to review the hammer submittal.

A monitoring program is recommended during construction to confirm all pile driving criteria are followed. Each pile should be logged for driving resistance and hammer efficiency. Driving should be halted if the pile meets practical refusal (defined herein as a driving resistance exceeding 15 blows/inch for 3 consecutive inches) at or below the minimum tip elevation.

### **Pavement Analysis and Design**

A bus loop and a parking lot are planned for the new school. Additional paved access to the back of the new school is also planned.

For the bus loop we estimated an average daily traffic (ADT) of 35. We assumed the traffic consists of 20 full-sized buses, 8 smaller special needs buses and 7 delivery trucks (2 to 3-axle). An ADT of 300 was estimated for the parking lot. We have assumed 1% of the total traffic for the parking area would consist of 2 to 3-axle delivery trucks. Our recommended pavement sections should be modified if the actual design traffic is significantly different.

Equivalent (18-kip) Single-Axle Loads (ESALs) for design were calculated using ESAL-conversion factors from the 2011 ODOT Pavement Design Guide (ODOT, 2011). Car and pickup truck factors were obtained from the 1993 AASHTO Pavement Design Guide and bus values were obtained from the 2003 Asphalt Pavement Design Guide prepared by the Asphalt Pavement Association of Oregon (APAO) (AASHTO, 1993; Huddleston, 2003). A 20-year and 30-year design life was assumed for flexible and rigid pavements, respectively.

Two site layout options are currently being considered. In one of those options the parking lot and driveways will be built partially over the demolished footprint of the existing school. In the other option, most of the new pavements will be built over grassy fields. For purposes of analysis, the subgrade under new pavements was assumed to consist of predominantly medium stiff to stiff, medium to high plasticity silty clay. For this material we have assumed a nominal subgrade resilient modulus ( $M_r$ ) value of 3,000 psf.

Pavement analysis was completed using the AASHTO (1993) procedure and input parameters recommended in the ODOT Pavement Design Guide (ODOT, 2011). Using the design traffic and assumed  $M_r$  value, we calculated a flexible pavement section consisting of 2.5 inches of asphaltic concrete (AC) over 11 inches of base rock for the parking lot, and a flexible pavement section of 4 inches of AC over 15 inches of base rock for the bus loop and for other areas subject to increase truck traffic (e.g., in driveways and near trash/recycle bins).

It is anticipated that most pavements will consist of flexible sections. However, areas at cross walks or for emergency vehicle access may be designed with PCC

concrete. We calculated a minimum rigid section would consist of 6½ inches of PCC over a 12-inch thick leveling course of base rock. However, ODOT typically recommends a minimum PCC section of 8 inches, with consideration to a thicker panel at bus stops. Therefore, we recommend using a rigid pavement section consisting of a minimum 8 inches of PCC over 12 inches of base rock. It should be noted that, without subgrade mitigation, the new pavements will be built over highly plastic clays. Flexible pavements typically are better suited to accommodate seasonal subgrade movement. If used, PCC sections should be reinforced to help resist cracking and deformation.

## **RECOMMENDATIONS**

### **Foundation Design and Construction (Conventional Foundation Option)**

Conventional foundations may be used if the site is mitigated with a thick granular pad (as described below). Design the foundations and slabs for the school buildings as follows:

1. Design all continuous wall footings and isolated column footings using an allowable bearing pressure of 2,500 psf. This presumptive value assumes that all footing will be underlain by ±2 to 3 feet of compacted crushed rock.
2. Use of coefficient of friction of 0.35 at the base of the footing for analysis of sliding resistance, assuming all footings bear on compacted Select Fill. A lateral bearing of 200 psf can be assumed for footings backfilled with Select Fill.
3. Assume a total settlement of ±1 inch under the maximum anticipated column load and a total settlement of ±¼ inch under the maximum anticipated wall load. Assume a potential differential settlement between columns and walls of half of the total settlement. Assume a potential (total) heave of up to ±¾ inch due to expansion of the underlying native clays. Differential heave is expected to be minimal based on the thickness of the granular mat proposed for site mitigation.
4. Provide a minimum footing width of 2 feet for all continuous wall footings. This minimum does not apply to thickened slab sections that support non-load bearing walls.
5. Use a modulus of subgrade reaction,  $k_s$ , of 250 kcf for floor slab design. Reinforce all floor slabs to reduce cracking, warping and differential movement. Rebar, instead of wire mesh, is recommended. The use of fiber as the sole method of reinforcement is not recommended. A vapor barrier may be used under the floor slab to assist in the concrete curing. Otherwise, a vapor barrier is not required due to the thickness of the granular building pad fill.

6. Design the building assuming a Site Class C and the seismic parameters provided in Figure 3A (Appendix A). These values are based on IBC 2012 (Section 1613). For comparison purposes, the response spectrum for the current OSSC code (which is based on the IBC 2009 code) is also shown in Figure 3A. The new OSSC code is scheduled to be released in July 2014. It is our assumption that the new OSSC code will be based on the seismic requirements of IBC 2012 (to be confirmed). The liquefaction potential of the foundation soils is negligible due to the plasticity of the surficial soils and the presence of shallow bedrock.

**Foundation Design and Construction (Pile Foundation Option)**

If the deep foundation option is selected, design and construct the piles according to the following recommendations:

7. Use pile piles meeting the requirements of Table 1.
8. Design the piles using the allowable and ultimate values shown in Table 2.
9. Estimate pile lengths using the tip elevations shown in Table 2. The recommended lengths are based on assumed cutoff and tip elevations. These elevations should be confirmed during final design after the FF has been established. A minimum of 3 feet of stick up is assumed for pile driving. The estimated tip elevations are based on assumed pile tip penetration into the sandstone. We recommend that at least 3 test piles be driven to confirm the penetration into the sandstone, before the production piles are cut or delivered to the site. The order or cut length of the production piles should be confirmed during construction based on the results of the test piles.

**Table 1. PP12.75x0.375 Properties**

Pile Properties	PP12.75x0.375
Steel Grade	ASTM A252, Grade 3
Yield Stress (F <sub>y</sub> )	45 ksi
Area Steel (A <sub>s</sub> )	14.6 in <sup>2</sup>
Nominal Structural Resistance (P <sub>n</sub> )	657 kips
End Condition	open-ended

Note: Nominal structural resistance (P<sub>n</sub>) is calculated as  $0.66^{\lambda}(F_y \times A_s)$ , where  $\lambda = 0$  for fully embedded piles.

**Table 2. Pile Properties and Design Parameters (PP12.75x0.375)**

<b>Pile Capacity</b>	
Ultimate Axial Capacity (kips)	250
Allowable Axial Capacity (kips)	100
Ultimate Uplift Capacity (kips) <sup>(1)</sup>	38
<b>Pile Tip Elevation and Estimated Length</b>	
Estimated Cutoff El. <sup>(2)</sup>	428.5
Minimum Pile Tip El. <sup>(3)</sup>	412.5
Estimated Pile Tip El.	411.5
Recommended Pile Length <sup>(4)</sup>	20
<b>Pile Driving Criteria</b>	
Driving condition	Driven open-ended
Maximum Allowable Driving Stress (ksi)	32,000 ksi
Pile Driving Evaluation Method	Wave Equation
Nominal Resistance for Driving (kips) <sup>(5)</sup>	250
Rec. Min. Hammer Energy (ft-lb)	± 5 to 17 ft-kips

Notes:

- (1) Ultimate uplift capacity corresponds to side resistance of piles driven to a minimum tip elevation.
- (2) Estimated pile cut-off elevation corresponds to an average ground surface elevation of ±El. 428.5.
- (3) Minimum pile tip elevation corresponds to average surface elevation of the soft (R2) sandstone stratum.
- (4) Recommended pile length is based on the estimated cut off elevation and estimated tip elevation, plus a minimum of 3 feet of stick up for pile driving.
- (5) Ultimate capacity and driving criteria to be confirmed prior to construction based on actual foundation loads.

10. Drive all piles using the recommended minimum hammer energy shown in Table 2. During construction, the actual hammer energy and required driving resistance should be confirmed by Wave Equation analysis once the contractor's proposed hammer is submitted for approval.

**Perimeter Foundation Drainage System for Buildings**

11. Install foundation drains along the perimeter of the building. The drains should consist of 3 or 4-inch diameter, perforated or slotted, PVC pipe wrapped in a Filter Fabric (specified below). The flowline of the pipe should be set as deep as possible (i.e., on top of the perimeter footings or near the base of the building pad fill).
12. Bed the pipe in at least 6 inches of 2-inch minus, clean drain rock and backfill to the full depth with drain rock. The entire mass of drain rock should be wrapped in a similar filter fabric that laps at least 12 inches at the top.
13. Provide clean-outs at appropriate locations for future maintenance of the drainage system.

The perimeter foundation system is recommended for the pile foundation option, but is not required if the site is over-excavated for the thickened building pad option. For that option, the drainage should be provided by one or more sumps installed to collect drainage from the corners of the rock pad.

**Materials and General Earthwork Specifications**

14. Select Fill as defined herein should consist of 1 or ¾-inch minus, clean (i.e., less than 5% passing (by weight) the #200 U.S. Sieve), well-graded, durable, crushed rock that is free of plastic clay, organic matter and construction debris. We should be provided a sample of the intended fill for approval, prior to delivery to the site.
14. Granular Site Fill should consist of 3-inch minus or 1 ½-inch minus, clean, well-graded, crushed (quarry) rock. Rounded bar-run gravel is appropriate only if placed during dry weather and capped by a slab prior to the onset of wet weather.
15. Compact all Select Fill and Granular Site Fill in loose lifts not exceeding 12 inches, unless specified otherwise below. Thinner lifts will be required if light or hand-operated equipment is used. Compact the fill to a minimum of 95% relative compaction. The maximum dry density of ASTM D698 should be used as the standard for estimating relative compaction. The same compaction specification should be used for the native subgrade beneath pavements (if compaction is appropriate).

Field density tests should be run frequently to confirm adequate compaction. Conventional laboratory and field density tests cannot be run on coarse (i.e., 3-inch minus) granular fill. In that case, the adequacy of the compaction should be based on field observation.

16. The Separation Geotextile should have Mean Average Roll Value (MARV) strength properties meeting the requirements of an AASHTO M 288-06 Class 2 woven geotextile (AASHTO, 2006).

The geotextile should have MARV hydraulic properties meeting the requirements of AASHTO M 288-2006 (geotextile for separation) with a permitivity greater than 0.05 sec.<sup>-1</sup> and an AOS less than 0.6 mm. We should be provided a specification sheet on the selected geotextile for approval prior to delivery to the site. This geotextile is not suitable for construction during wet weather.

17. Filter Fabric should consist of a non-woven geotextile with a grab tensile strength greater than 200 lb., an apparent opening size (AOS) of between #70 and 100 (US Sieve) and a permitivity greater than 0.1 sec.<sup>-1</sup>.

18. Inform contractors that utility construction will encounter perched ground water and require dewatering for any excavations completed during the winter. Shoring will be needed in all trenches to protect workers from sloughing or caving soils. Assume an OR-OSHA Type B soils for planning utility trenching and/or shoring (OR-OSHA, 2011).

**Site Mitigation Option and Building Pad Construction (Dry Weather)**

Building pad construction during wet weather is not recommended. Prepare the pads for the new classroom and gym/cafeteria buildings in dry weather as follows:

19. Strip the existing ground  $\pm 4$  inches, or as required to remove roots or sod. The actual depth of stripping should be confirmed by FEI during construction. Dispose of all strippings outside of construction areas. The strippings should be hauled from the site or reused only in landscape areas. No strippings should be placed beneath foundations, slabs, sidewalks or pavements.
20. Excavate the underlying plastic clay to a depth of  $\pm 4$  to 5 feet (to be confirmed by FEI during construction). The limits of the excavation should extend at least 5 feet beyond the outside edge of any foundation or slab. We recommend the bid documents include a unit cost for excavation of plastic clay and replacement with compacted, granular fill to accommodate any variation in the excavation depth.
21. Haul the clay from the site. Do not re-use as site fill, including under parking lots, driveways or sidewalks. The plastic clay will be difficult to work with, in particular during wet weather. Therefore, we do not recommend its re-use under sport fields or landscape areas.
22. Overexcavate any test pits that extend below the bottom of the building pad excavation and replace with compacted Select Fill or Granular Site Fill.
23. Do not compact the exposed subgrade. Grade the bottom of the excavation to direct any water that would tend to accumulate on the subgrade to one or more corners. Install manholes or sumps equipped with a submersible pump and float controls as required to dewater the granular pad during wet weather.
24. Do not allow the subgrade to dry. Immediately cover the subgrade with a vapor barrier followed by a separation geotextile (to protect the membrane from damage by the rock fill).
25. Cover the geotextile with Select Fill, Granular Site Fill or a combination thereof, to the required grade. Spread and compact the fill in lifts as specified in Item 15. If Granular Site Fill is used, it should be capped with a minimum of 12 inches of Select Fill. The initial lift of fill should be sufficiently thick to allow it to be spread and compacted without damaging the underlying subgrade.

26. Excavate for footings as required. All loose or disturbed granular fill should be removed or re-compacted in the bottom of the footing trenches or excavations. To expedite foundation construction, a thin leveling course of compacted Select Fill may be placed in the bottom of the footing excavations.

### **Staging Areas and Haul Roads**

27. Strip the subgrade for staging areas and haul roads as described above for the building pad. All staging areas, temporary haul roads or other areas subject to heavy truck or construction equipment should consist of at least 24 inches of granular fill (Select Fill or a combination of Granular Site Fill and Select Fill) over a Separation Geotextile. Do not allow continuous construction traffic on the rock section until a minimum of 24 inches of rock is in place.

### **Subgrade Preparation and Pavement Construction**

The required site grading for the proposed paved parking lots is not currently known. Furthermore, it is possible portions of the new pavements may be built over the footprint of the existing school (depending on which site layout is selected). As a result, the presence, extent and depth of any foundations, slabs and fill under existing structures are not currently known and will have to be confirmed during construction. Subgrade preparation should be done in dry weather to avoid the need for stabilization or overexcavation of any soft surficial soil.

The subgrade and pavements should be constructed as follows:

28. Strip the existing ground  $\pm 2$  to 4 inches, or as required to remove roots and sod, or any existing demolition debris (from the existing school). The extent or depth of additional site stripping should be established by an FEI representative during construction. It is assumed herein that the subgrade will not be over-excavated under new pavements. However, we recommend that a unit cost for overexcavation, disposal, and replacement of unsuitable soil, demolition debris, or fill be included in the construction bid documents. Haul all strippings and demolition debris from the site.
29. Grade the subgrade as required. Do not reuse materials generated by site grading under any sidewalks, parking lots or foundation areas.
30. Compact the subgrade under pavements to a depth of 12 inches. Compaction may not be practical if the soils are too wet of optimum. Therefore, the site work should not be attempted during wet weather and should be delayed until the subgrade soils are sufficiently dry or until weather permits efficient aeration. Compaction of stiff, highly plastic clays should not be attempted.



If wet weather construction cannot be avoided, do not compact the subgrade. Instead, overexcavate the subgrade to provide a minimum 24-inch thick base rock section. In lieu of subgrade compaction, the thickened base rock section should be left in place for pavement construction.

31. Place a Separation Geotextile over the prepared subgrade under staging areas, haul roads or other areas subject to heavy traffic (in particular areas of ingress/egress). A Separation Geotextile is also recommended if overexcavation and additional subbase is planned in lieu of subgrade compaction. We recommend a Separation Geotextile be placed at least under all bus lanes and driveways. A geotextile should be considered under parking lots if they are built during wet weather or if the base rock will be exposed to wet weather prior to paving.
32. Cover the prepared subgrade with base rock (Select Fill) immediately to reduce exposure to weather and compact as specified in Item 15.
33. Proof-roll the prepared base rock. Overexcavate and replace any areas of base rock and/or subgrade pumping with additional compacted Select Fill.
34. Provide a minimum flexible pavement section of 2.5 inches of AC over 11 inches of base rock for all parking lots, parking stalls, and driveways not subject to buses or truck traffic. Do not allow loaded trucks or heavy construction equipment on the finished base rock prior to paving.

Increase the pavement section to 4 inches of AC over 15 inches of base rock for bus lanes and driveways or any paved areas that will be subject to truck traffic.

Where rigid pavements are planned, we recommend a minimum PCC thickness of 8 inches over 12 inches of base rock. In general, if subgrade stabilization is not planned, flexible rather than rigid pavements are preferred (to better accommodate potential subgrade heave).

Increase the base rock thickness for the individual pavement sections to 24 inches (as indicated in Item 30 for wet weather construction). This added base rock should be left in place for pavement construction (to reflect the lack of subgrade compaction).

Evaluation of potential subgrade mitigation (e.g., soil amendment or over-excavation) was not part of the present scope of work. It should be assumed that possible seasonal movement of the subgrade will likely reduce the normal design life of pavements, cause cracking or deflections of joints in rigid pavements, and possible uneven pavement surfaces. Periodic maintenance of the pavement surface should be planned. Cracking and displacement of joints in sidewalks and curbs are also a risk of construction over expansive clays.

#### **DESIGN REVIEW/CONSTRUCTION OBSERVATION/TESTING**

We should be provided the opportunity to review all drawings and specifications that pertain to site preparation, foundation construction and pavements. Foundation construction will require field confirmation of the pile capacity, driving resistance and embedment. Mitigation of any unsuitable fill or soil, ground water infiltration, or subgrade pumping will also require engineering review and judgment. That judgment should be provided by one of our representatives. Frequent field density tests should be run on all engineered fill, subgrade and base rock. We recommend that we be retained to provide the necessary construction observation.

#### **VARIATION OF SUBSURFACE CONDITIONS, USE OF THIS REPORT AND WARRANTY**

The analysis, conclusions and recommendations contained herein are based on the assumption that the soil profiles and ground water levels encountered in the borings are representative of overall site conditions. No changes in the enclosed recommendations should be made without our approval. We will assume no responsibility or liability for any engineering judgment, inspection or testing performed by others.

This report was prepared for the exclusive use of Lane County School District 4J and their design consultants for the Roosevelt Middle School in Eugene, Oregon. Information contained herein should not be used for other building sites or for unanticipated construction without our written consent. This report is intended for planning and design purposes. Contractors using this information to estimate construction quantities or costs do so at their own risk. Our services do not include any survey or assessment of potential surface contamination or contamination of the soil or ground water by hazardous or toxic materials. We assume that those services, if needed, have been completed by others.

Climate conditions in western Oregon typically consist of wet weather for almost half of the year (typically between mid-October and late May). The recommendations for foundation design and drainage are not intended to represent any warranty (expressed or implied) against the growth of mold, mildew or other organism that grows in a humid or moist environment.

Our work was done in accordance with generally accepted soil and foundation engineering practices. No other warranty, expressed or implied, is made.

## REFERENCES

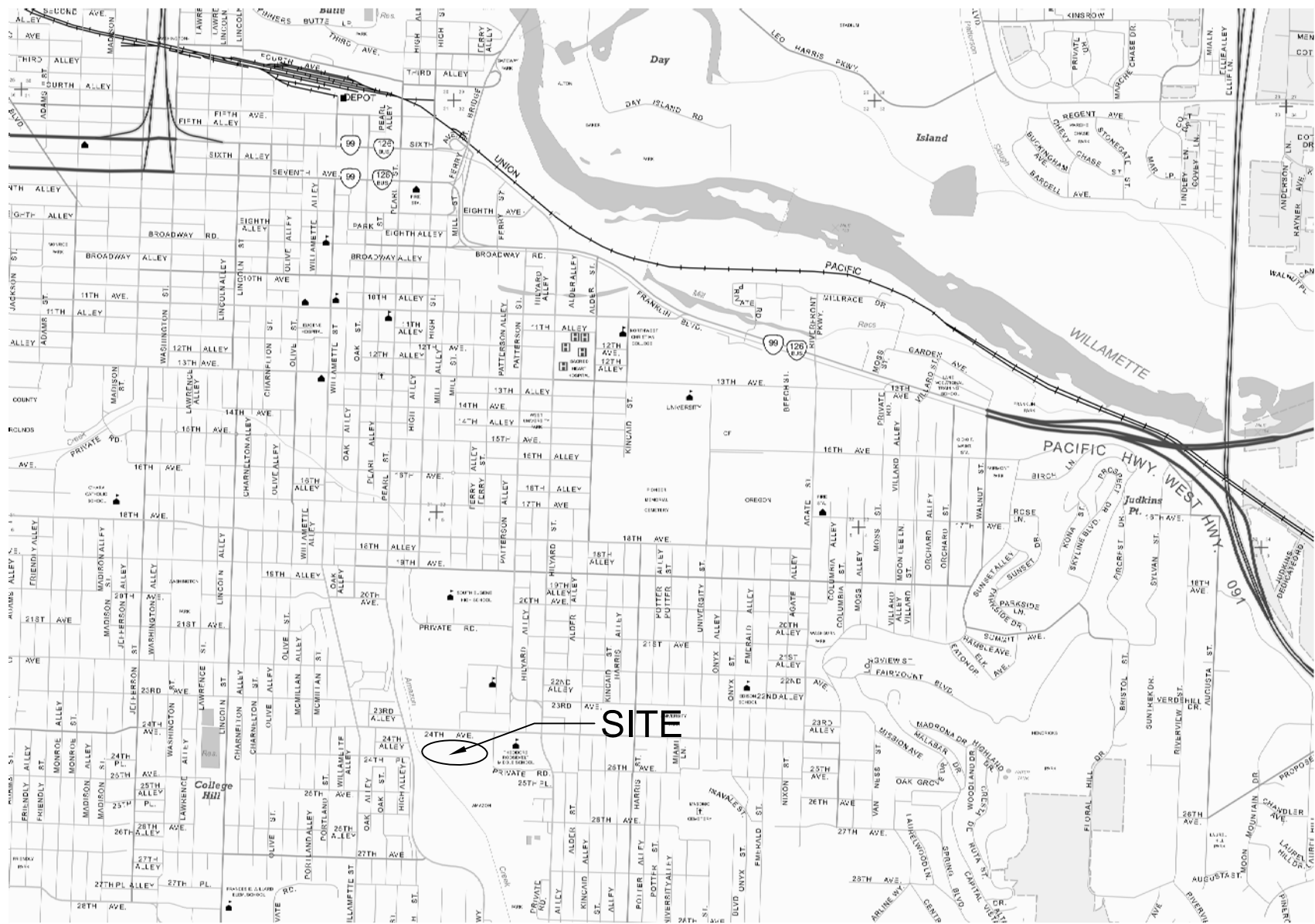
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# Appendix A

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## *Figures*



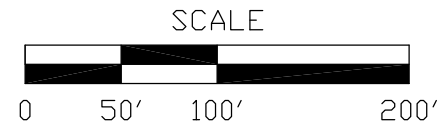
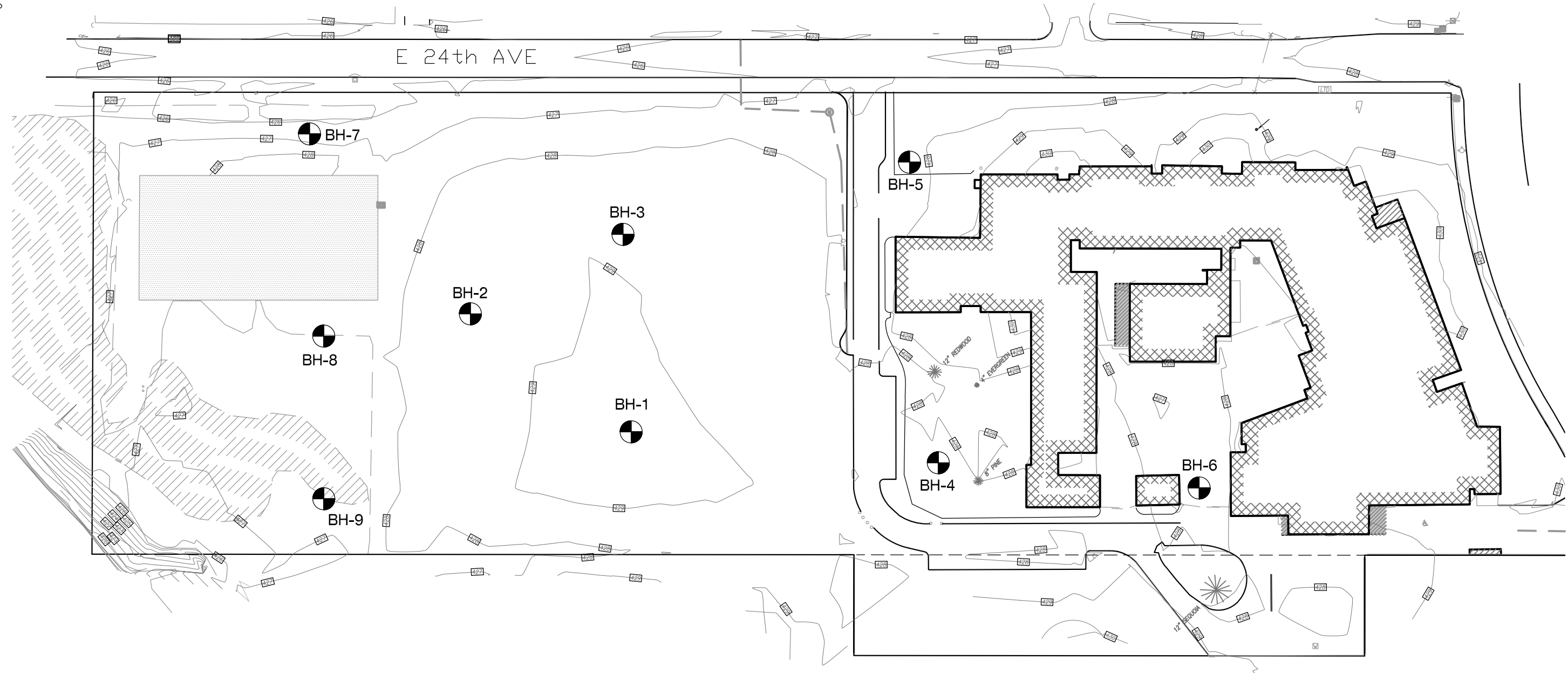
Not to Scale


**FOUNDATION ENGINEERING INC.**  
 PROFESSIONAL GEOTECHNICAL SERVICES  
 820 NW CORNELL AVENUE  
 CORVALLIS, OR 97330-4517  
 BUS. (541) 757-7645 FAX (541) 757-7650


DATE FEB. 2014  
 DWN. mdm  
 APPR. \_\_\_\_\_  
 REVIS. \_\_\_\_\_  
 PROJECT NO.  
 2141017

**VICINITY MAP**  
 ROOSEVELT MIDDLE SCHOOL  
 EUGENE, OREGON

FIGURE NO.  
**1A**



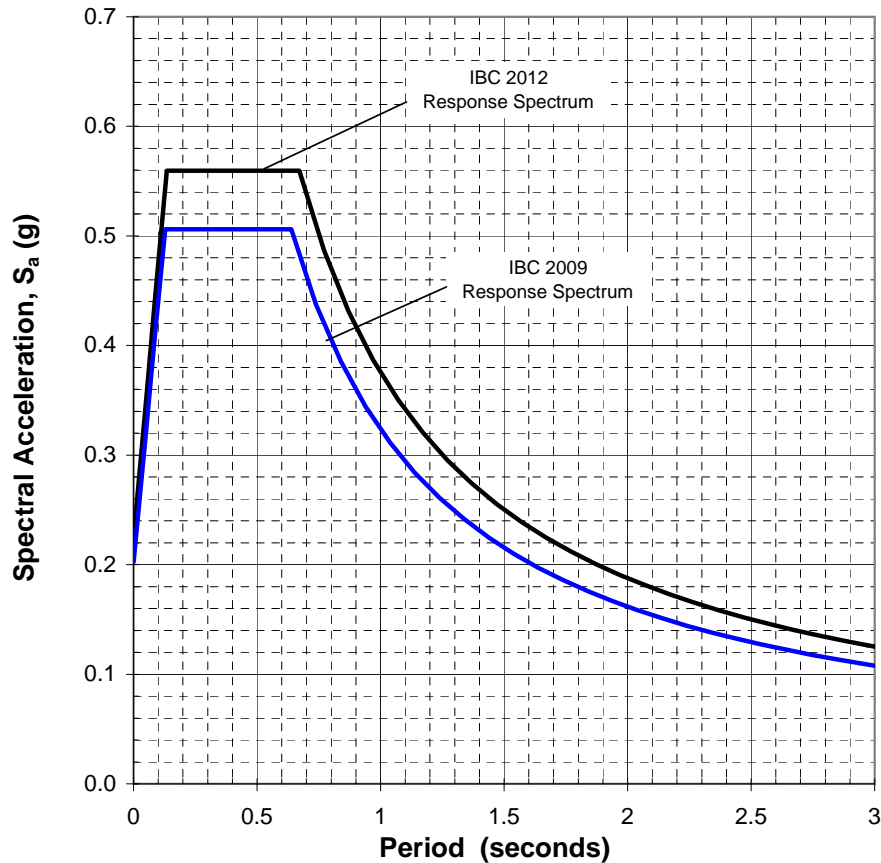
- NOTES:
1. BORING LOCATIONS ARE APPROXIMATE ONLY.
  2. SEE REPORT FOR A DISCUSSION OF SUBSURFACE CONDITIONS.
  3. BASE MAP PROVIDED BY BRANCH ENGINEERING.

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DATE MARCH 2014  
 DWN. MDM  
 APPR. \_\_\_\_\_  
 REVIS. \_\_\_\_\_  
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 2141017

**BORING LOCATIONS**  
 ROOSEVELT MIDDLE SCHOOL  
 EUGENE, OREGON

FIGURE NO.  
**2A**



**Notes:**

1. The Design Response Spectra are based on IBC 2012 Section 1613.
2. The following parameters are based on the modified USGS 2008 maps provided in the IBC 2012:
 

Site Class= C	Damping = 5%		
$S_S = 0.77$	$F_a = 1.09$	$S_{MS} = 0.84$	$S_{DS} = 0.56$
$S_1 = 0.40$	$F_v = 1.40$	$S_{M1} = 0.56$	$S_{D1} = 0.38$
3.  $S_S$  and  $S_1$  values indicated in Note 2 are the mapped, risk-targeted maximum considered earthquake spectral accelerations for 1% probability of exceedence in 50 years.
4. The following parameters are based on USGS 2002 maps provided in IBC 2009.
 

Site Class= C	Damping = 5%		
$S_S = 0.67$	$F_a = 1.13$	$S_{MS} = 0.76$	$S_{DS} = 0.51$
$S_1 = 0.33$	$F_v = 1.47$	$S_{M1} = 0.48$	$S_{D1} = 0.32$
5.  $S_S$  and  $S_1$  values reported in Note 4 are the mapped maximum considered earthquake spectral accelerations for 2% probability of exceedence in 50 years.
6.  $F_a$  and  $F_v$  were established based on IBC 2012, Tables 1613.3.3(1) and 1613.3.3(2) using the selected  $S_S$  and  $S_1$  values.  $S_{DS}$  and  $S_{D1}$  values include a 2/3 reduction on  $S_{MS}$  and  $S_{M1}$  as discussed in IBC 2012 Section 1613.3.4.
7. Site location is: Latitude 44.0327, Longitude -123.0866.

**FIGURE 3A**  
**IBC 2012/2009 SITE RESPONSE SPECTRA**  
**ROOSEVELT MIDDLE SCHOOL**  
**EUGENE, OREGON**  
**FEI PROJECT 2141017**



# Appendix B

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## *Boring Logs and Core Box Photos*



## DISTINCTION BETWEEN FIELD LOGS AND FINAL LOGS

A field log is prepared for each boring or test pit by our field representative. The log contains information concerning sampling depths and the presence of various materials such as gravel, cobbles, and fill, and observations of ground water. It also contains our interpretation of the soil conditions between samples. The final logs presented in this report represent our interpretation of the contents of the field logs and the results of the laboratory examinations and tests. Our recommendations are based on the contents of the final logs and the information contained therein and not on the field logs.

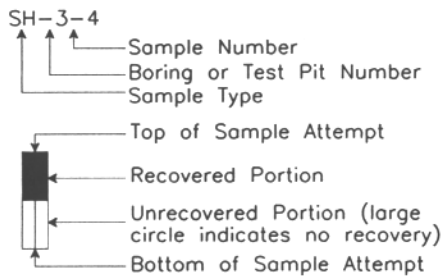
## VARIATION IN SOILS BETWEEN TEST PITS AND BORINGS

The final log and related information depict subsurface conditions only at the specific location and on the date indicated. Those using the information contained herein should be aware that soil conditions at other locations or on other dates may differ. Actual foundation or subgrade conditions should be confirmed by us during construction.

## TRANSITION BETWEEN SOIL OR ROCK TYPES

The lines designating the interface between soil, fill or rock on the final logs and on subsurface profiles presented in the report are determined by interpolation and are therefore approximate. The transition between the materials may be abrupt or gradual. Only at boring or test pit locations should profiles be considered as reasonably accurate and then only to the degree implied by the notes thereon.

## SAMPLE OR TEST SYMBOLS



- S - Grab Samples
- SS - Standard Penetration Test Sample (split-spoon)
- SH - Thin-walled Shelby Tube Sample
- C - Core Sample
- CS - Continuous Sample

- ▲ Standard Penetration Test Resistance equals the number of blows a 140 lb. weight falling 30 in. is required to drive a standard split-spoon sampler 1 ft. Practical refusal is equal to 50 or more blows per 6 in. of sampler penetration.
- Water Content (%).

### UNIFIED SOIL CLASSIFICATION SYMBOLS

- |            |                     |
|------------|---------------------|
| G - Gravel | W - Well Graded     |
| S - Sand   | P - Poorly Graded   |
| M - Silt   | L - Low Plasticity  |
| C - Clay   | H - High Plasticity |
| Pt - Peat  | O - Organic         |

### FIELD SHEAR STRENGTH TEST

Shear strength measurements on test pit side walls, blocks of soil or Shelby tube samples are typically made with Torvane or pocket penetrometer devices.

### TYPICAL SOIL/ROCK SYMBOLS

- |  |        |  |           |
|--|--------|--|-----------|
|  | Sand   |  | Silt      |
|  | Clay   |  | Gravel    |
|  | Basalt |  | Siltstone |

### WATER TABLE

- Water Table Location
- (1/31/00) Date of Measurement
- Piezometer Tip Location (if used)

## Explanation of Common Terms Used in Soil Descriptions

Field Identification	Cohesive Soils			Granular Soils	
	SPT	$S_u^*$ (tsf)	Term	SPT	Term
Easily penetrated several inches by fist.	0 - 1	< 0.125	Very Soft	0 - 4	Very Loose
Easily penetrated several inches by thumb.	2 - 4	0.125-0.25	Soft	5 - 10	Loose
Can be penetrated several inches by thumb with moderate effort.	5 - 8	0.25 - 0.50	Medium Stiff (Firm)	11 - 30	Medium Dense
Readily indented by thumb but penetrated only with great effort.	9 - 15	0.50 - 1.0	Stiff	31 - 50	Dense
Readily indented by thumbnail.	16 - 30	1.0 - 2.0	Very Stiff	> 50	Very Dense
Indented with difficulty by thumbnail.	31 - 60	> 2.0	Hard		

\* Undrained shear strength

Term	Soil Moisture Field Description
Dry	Absence of moisture. Dusty. Dry to the touch.
Damp	Soil has moisture. Cohesive soils are below plastic limit and usually moldable.
Moist	Grains appear darkened, but no visible water. Silt/clay will clump. Sand will bulk. Soils are often at or near plastic limit.
Wet	Visible water on larger grain surfaces. Sand and cohesionless silt exhibit dilatancy. Cohesive silt/clay can be readily remolded. Soil leaves wetness on the hand when squeezed. "Wet" indicates that the soil is wetter than the optimum moisture content and above the plastic limit.

Term	PI	Plasticity Field Test
Nonplastic	0 - 3	Cannot be rolled into a thread.
Low Plasticity	3 - 15	Can be rolled into a thread with some difficulty.
Medium Plasticity	15 - 30	Easily rolled into thread.
High Plasticity	> 30	Easily rolled and rerolled into thread.

Term	Soil Structure Criteria
Stratified	Alternating layers at least 1 inch thick - describe variation.
Laminated	Alternating layers at less than 1 inch thick - describe variation.
Fissured	Contains shears and partings along planes of weakness.
Slickensides	Partings appear glossy or striated.
Blocky	Breaks into lumps - crumbly.
Lensed	Contains pockets of different soils - describe variation.

Term	Soil Cementation Criteria
Weak	Breaks under light finger pressure.
Moderate	Breaks under hard finger pressure.
Strong	Will not break with finger pressure.

## Explanation of Common Terms Used in Rock Descriptions

Field Identification		UCS (psi)	UCS (MPa)	Strength (Hardness)
Indented by thumbnail.	R0	< 100	0.25-1.0	Extremely Weak (Extremely Soft)
Crumbles under firm blows with geological hammer, can be peeled by a pocket knife.	R1	100-1000	1.0-5.0	Very Weak (Very Soft)
Can be peeled by a pocket knife with difficulty, shallow indentations made by firm blow with geological hammer.	R2	1000-4000	5.0-25	Weak (Soft)
Cannot be scraped or peeled with a pocket knife, specimen can be fractured with a single blow of geological hammer.	R3	4000-8000	25-50	Medium Strong (Medium Hard)
Specimen requires more than one blow of geological hammer to fracture it.	R4	8000-16000	50-100	Strong (Hard)
Specimen requires many blows of geological hammer to fracture it.	R5	16000-36000	100-250	Very Strong (Very Hard)
Specimen can only be chipped with geological hammer.	R6	> 36000	> 250	Extremely Strong (Extremely Hard)

Term	Weathering Field Identification
Fresh	Crystals are bright. Discontinuities may show some minor surface staining. No discoloration in rock fabric.
Slightly Weathered	Rock mass is generally fresh. Discontinuities are stained and may contain clay. Some discoloration in rock fabric.
Moderately Weathered	Significant portions of rock show discoloration and weathering effects. Crystals are dull and show visible chemical alteration. Discontinuities are stained and may contain secondary mineral deposits.
Highly Weathered	Rock can be excavated with geologist's pick. All discontinuities exhibit secondary mineralization. Complete discoloration of rock fabric. Surface of core is friable and usually pitted due to washing out of highly altered minerals by drilling water.
Decomposed	Rock mass is completely decomposed. Original rock "fabric" may be evident. May be reduced to soil with hand pressure.

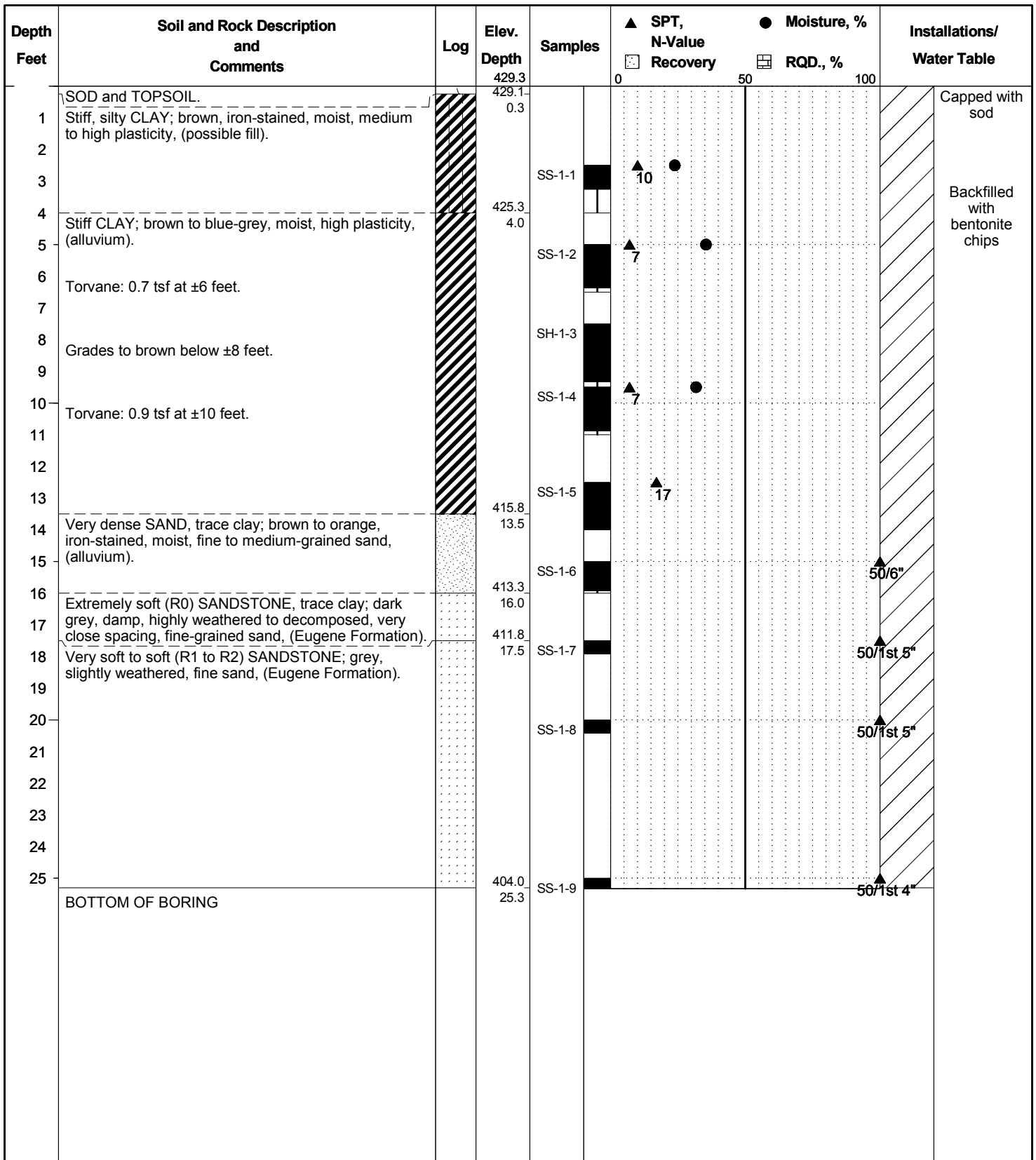
Spacing (meters)	Spacing (feet)	Spacing Term	Bedding/Foliation
< 0.06	< 2 in.	Very Close	Very Thin
0.06 - 0.30	2 in. - 1 ft.	Close	Thin
0.30 - 0.90	1 ft. - 3 ft.	Moderately Close	Medium
0.90 - 3.0	3 ft. - 10 ft.	Wide	Thick
> 3.0	> 10 ft.	Very Wide	Very Thick (Massive)

Vesicle Term	Volume
Some	3 - 20%
Highly	20 - 50%
Scoria	> 50%

Stratification Term	Description
Lamination	<0.39 in. thick beds
Fissile	Preferred break along laminations
Parting	Preferred break direction
Foliation	Metamorphic layering of minerals

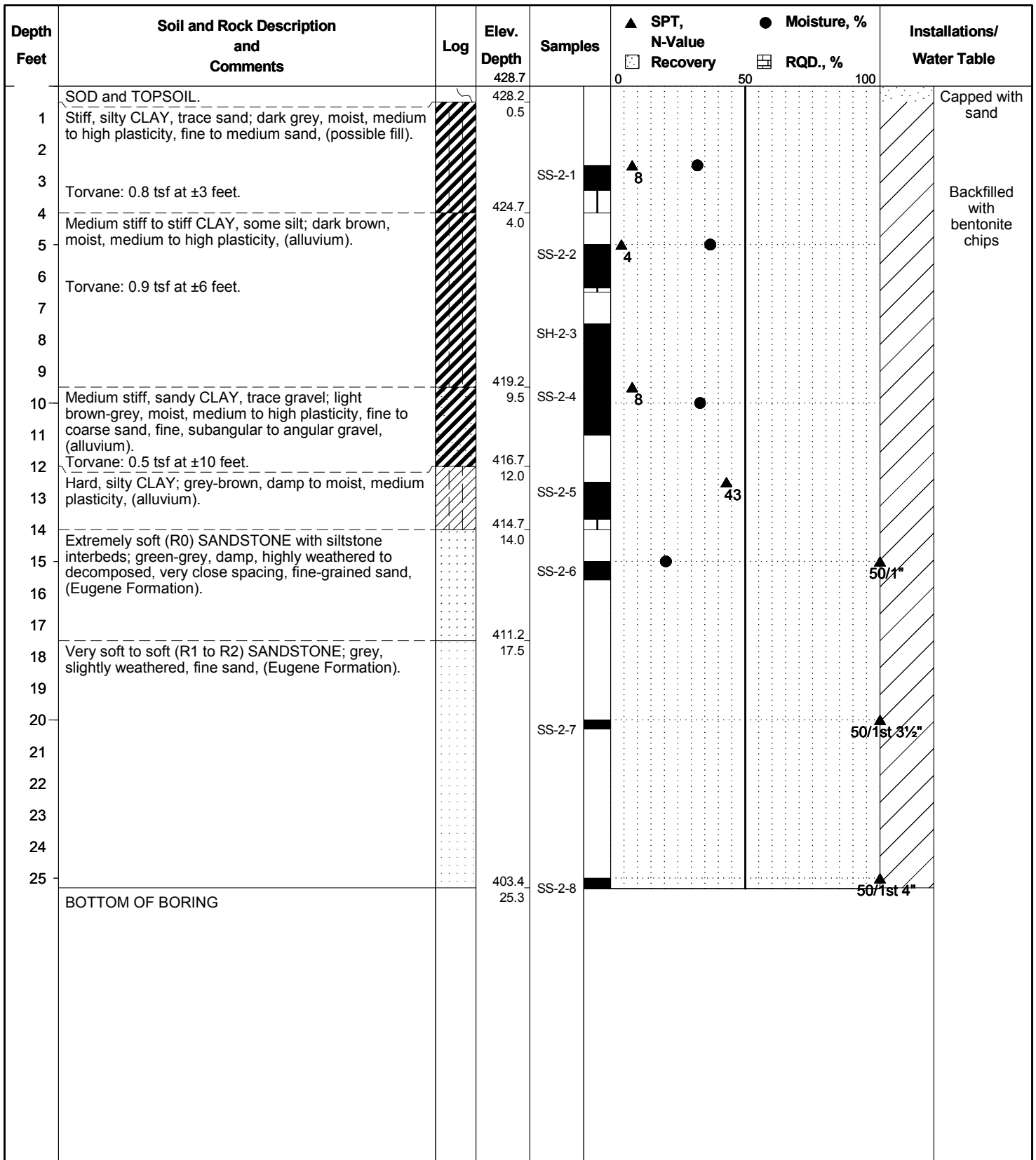
RQD %	Designation	RQD %	Designation
0 - 25	Very Poor	75 - 90	Good
25 - 50	Poor	90 - 100	Excellent
50 - 75	Fair		

Rock Quality Designation (RQD) is the percent of a core run with intact lengths greater than 4.0 in. excluding breaks caused by drilling.



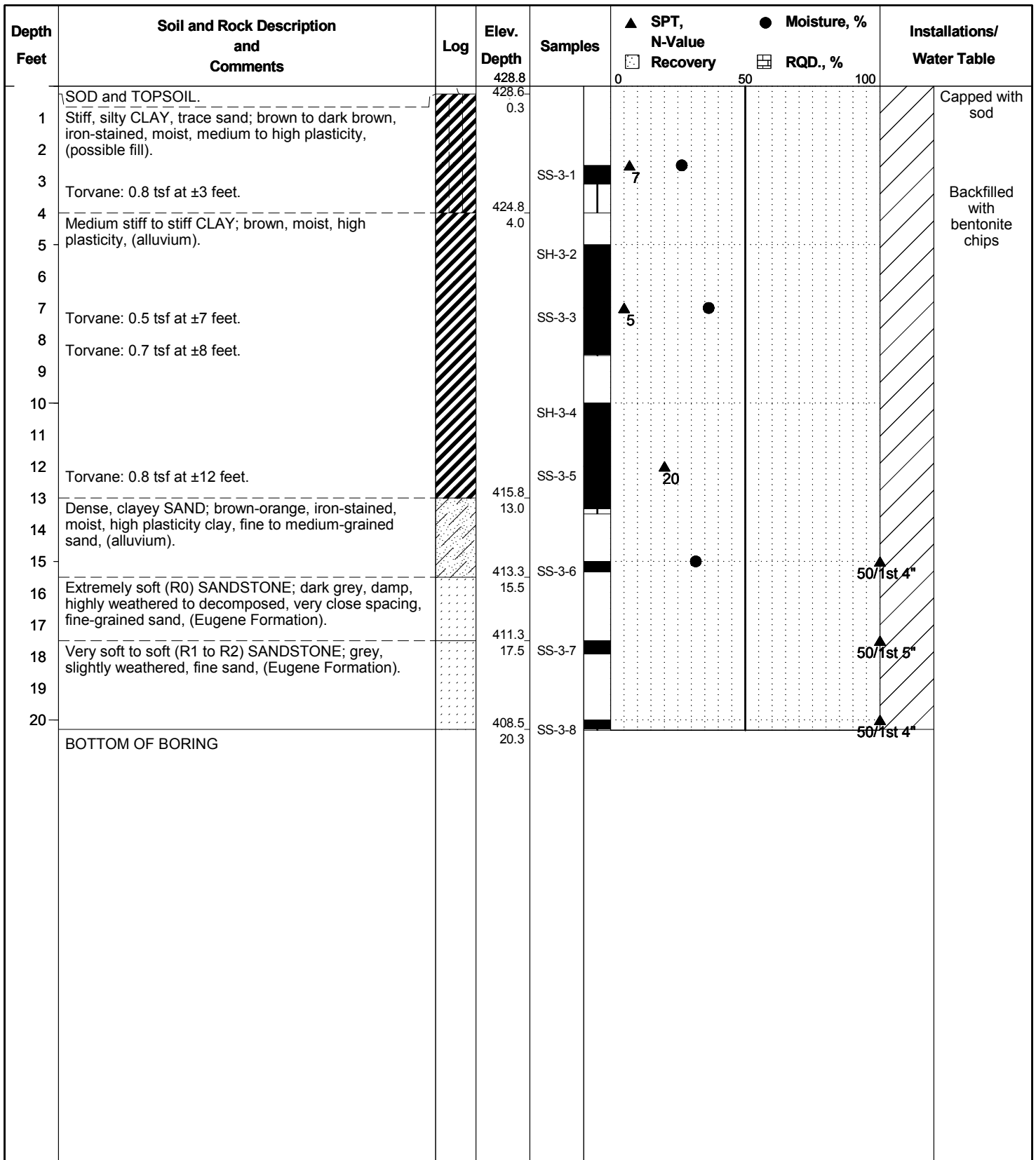
Project No.: 2041105  
 Surface Elevation: 429.3 feet (Approx.)  
 Date of Boring: August 12, 2004

**Boring Log: BH-1**  
**Roosevelt Middle School**  
**Eugene, Oregon**



Project No.: 2041105  
 Surface Elevation: 428.7 feet (Approx.)  
 Date of Boring: August 12, 2004

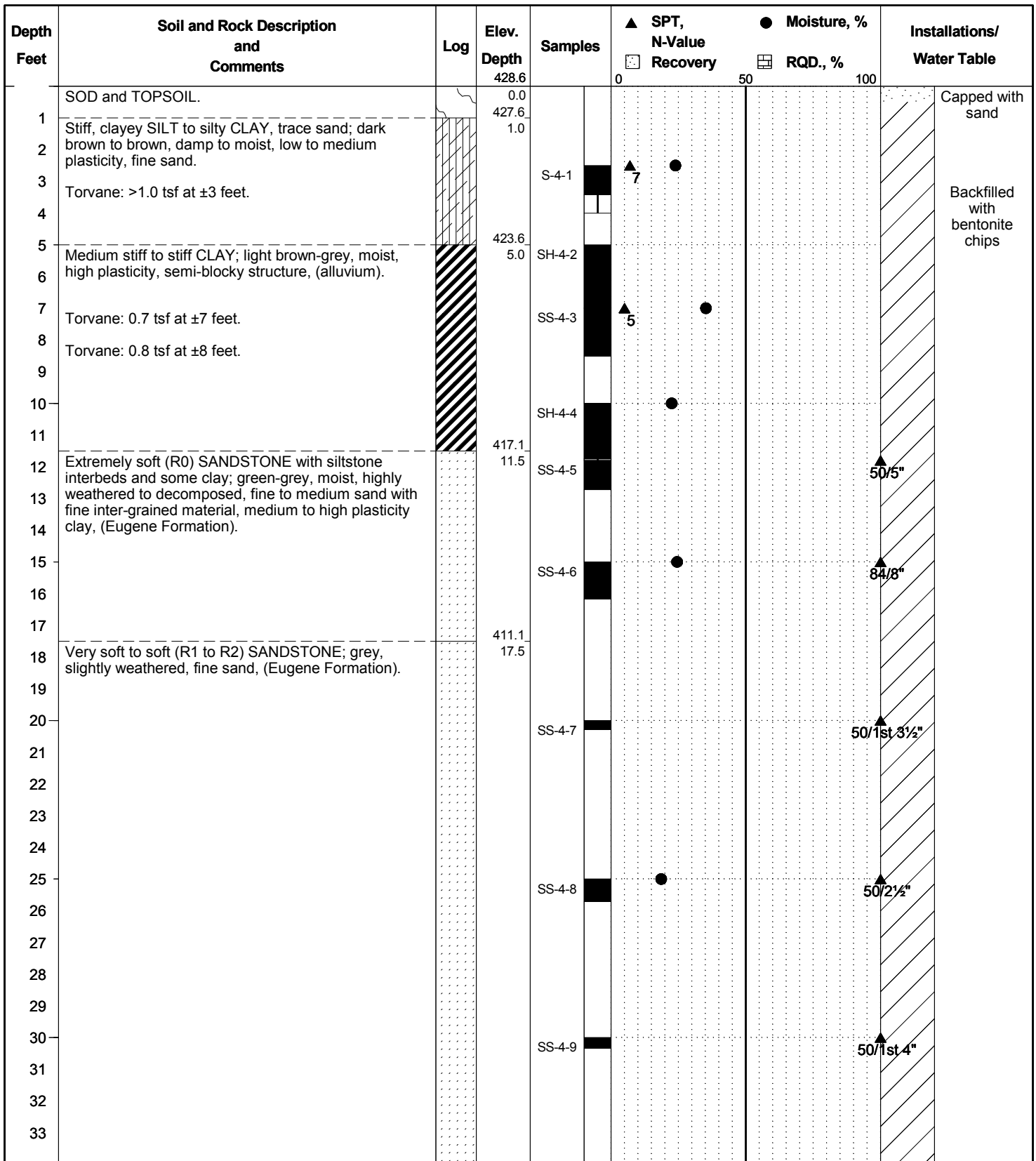
**Boring Log: BH-2**  
**Roosevelt Middle School**  
**Eugene, Oregon**



Project No.: 2041105  
 Surface Elevation: 428.8 feet (Approx.)  
 Date of Boring: August 12, 2004

**Boring Log: BH-3**  
**Roosevelt Middle School**  
**Eugene, Oregon**





Project No.: 2041105  
 Surface Elevation: 428.6 feet (Approx.)  
 Date of Boring: August 12, 2004

**Boring Log: BH-4**  
**Roosevelt Middle School**  
**Eugene, Oregon**



Depth Feet	Soil and Rock Description and Comments	Log	Elev. Depth	Samples	▲ SPT, N-Value	● Moisture, %	Installations/ Water Table
					☐ Recovery	▣ RQD., %	
			394.6		0	50	100
35				SS-4-10		●	50/1st 3 1/2"
36							
37							
38							
39							
40				SS-4-11		●	50/1st 3"
41							
42							
43							
44							
45				SS-4-12			50/1st 2 1/2"
46							
47							
48							
49							
50							
	BOTTOM OF BORING		378.5 50.1	SS-4-13			50/1st 1 1/2"

Project No.: 2041105

Surface Elevation: 428.6 feet (Approx.)

Date of Boring: August 12, 2004

**Boring Log: BH-4**

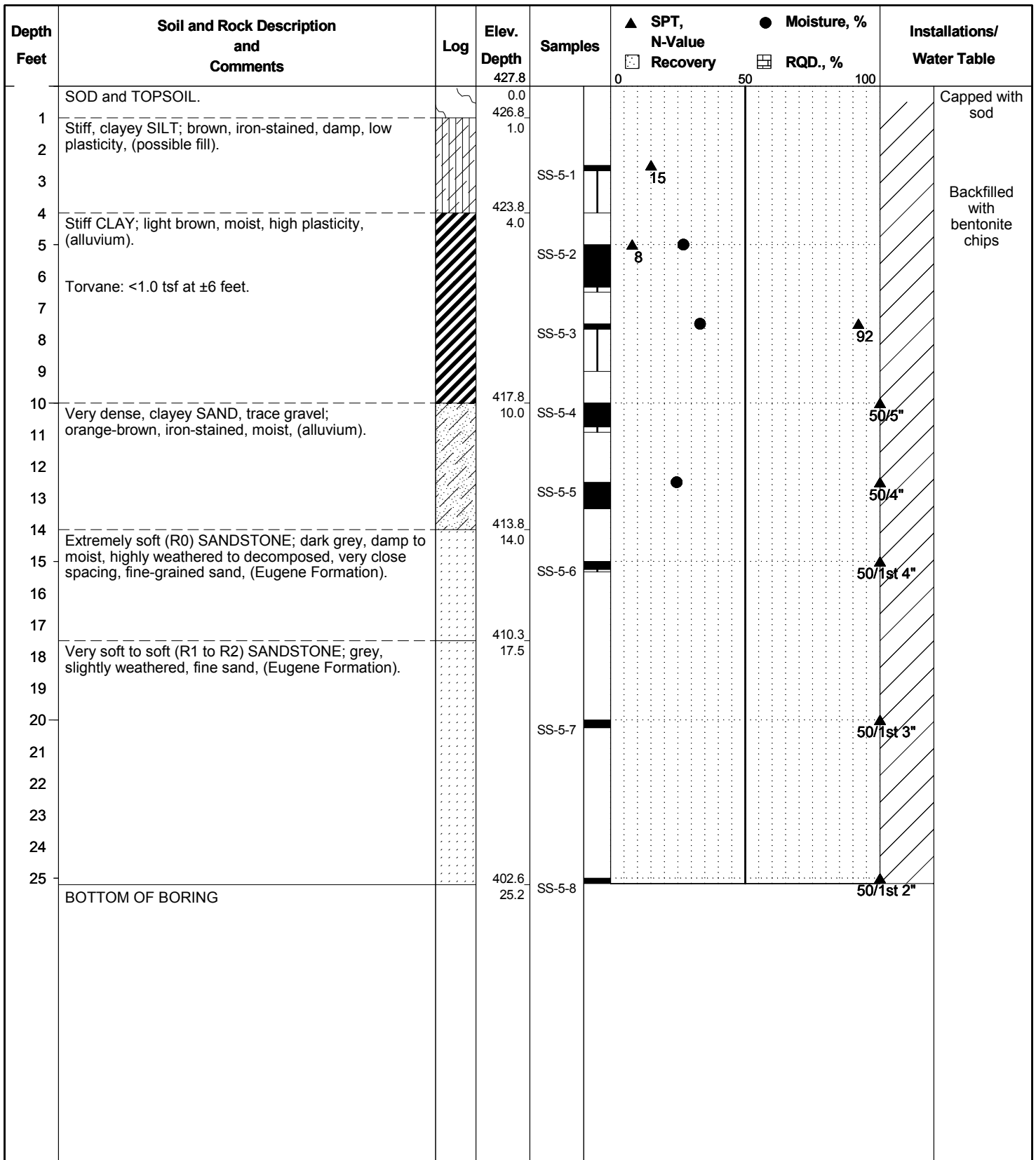
**Roosevelt Middle School**

**Eugene, Oregon**



**Foundation Engineering, Inc.**





Project No.: 2041105  
 Surface Elevation: 427.8 feet (Approx.)  
 Date of Boring: August 12, 2004

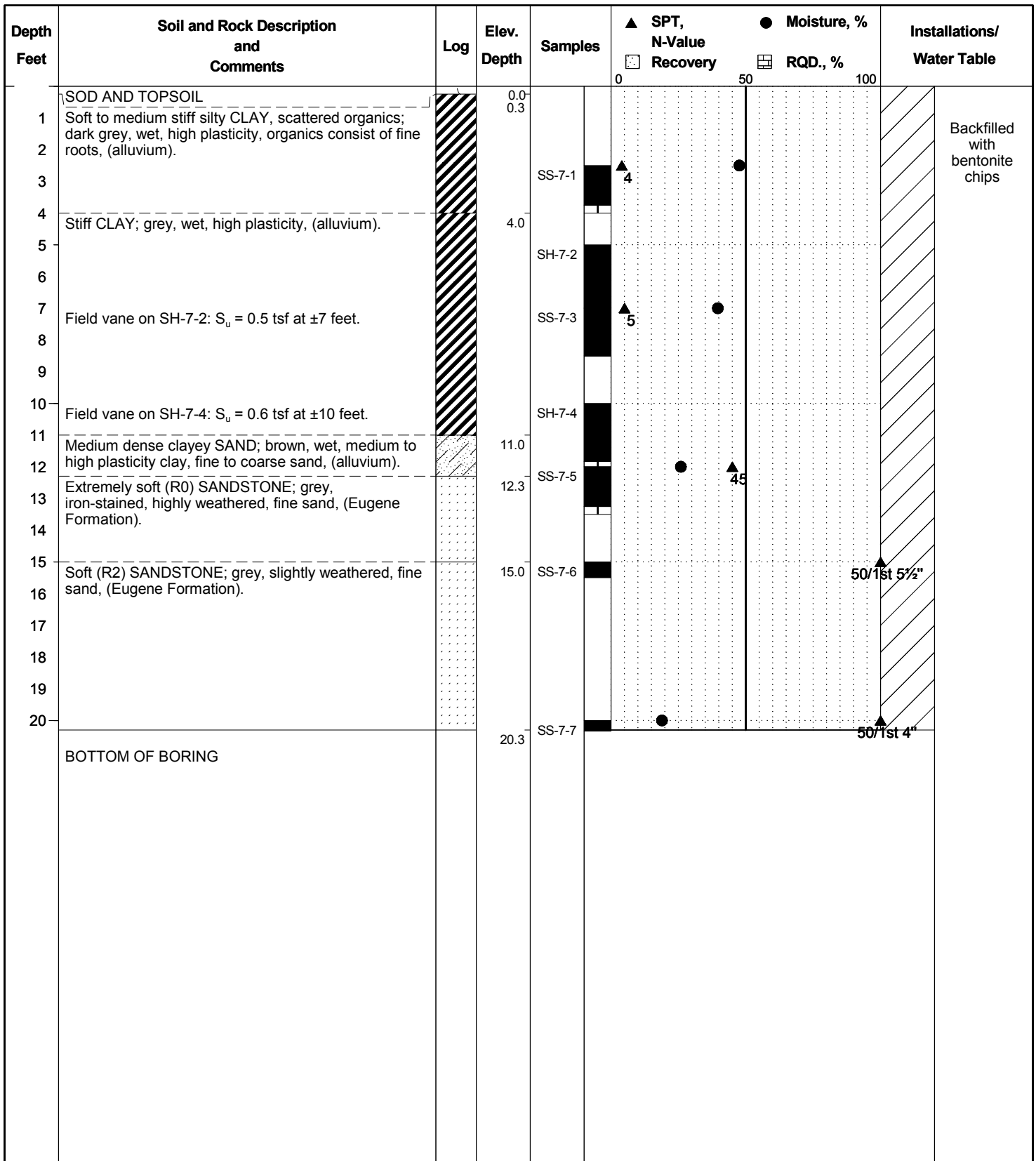
**Boring Log: BH-5**  
**Roosevelt Middle School**  
**Eugene, Oregon**

Depth Feet	Soil and Rock Description and Comments	Log	Elev. Depth	Samples	SPT, N-Value		Moisture, %		Installations/ Water Table
					Recovery		RQD., %		
			428			0	50	100	
1	ASPHALTIC CONCRETE (±3 inches). Stiff CLAY; dark brown-grey, moist, high plasticity, (alluvium).		427.8 0.3						Capped with A/C cold patch
2									
3	Torvane: 0.8 tsf at ±3 feet.			SS-6-1	▲ 7	●			
4									
5	Torvane: 0.6 tsf at ±5 feet.								
6			422.0	SH-6-2	▲ 20				
7	Very stiff, clayey SILT, trace sand; brown-grey to orange, iron-stained, moist, high plasticity, (residual).		6.0	SS-6-3					
8	Medium dense to dense, silty to clayey SAND, trace rock fragments; light brown-orange, iron-stained, moist, fine to coarse-grained sand, weak to moderate cementation, (residual).		421.0						
9			7.0	SS-6-4		●			
10									
11				SS-6-5	▲ 18				
12									
13	Extremely weak (R0) SANDSTONE, trace clay; dark grey, trace iron-staining, highly weathered to decomposed, very close spacing, fine-grained sand, (Eugene Formation).		415.5	SS-6-6					50/1st 6"
14			12.5						
15	Very soft to soft (R1 to R2) SANDSTONE; grey, slightly weathered, fine sand, (Eugene Formation).		413.0	SS-6-7					50/1st 5"
16			15.0						
17									
18									
19									
20									
	BOTTOM OF BORING		407.6	SS-6-8					50/1st 5"
			20.4						

Project No.: 2041105  
 Surface Elevation: 428.0 feet (Approx.)  
 Date of Boring: August 13, 2004

**Boring Log: BH-6**  
**Roosevelt Middle School**  
**Eugene, Oregon**





Project No.: 2141017

Surface Elevation: (Approx.)

Date of Boring: February 24, 2014

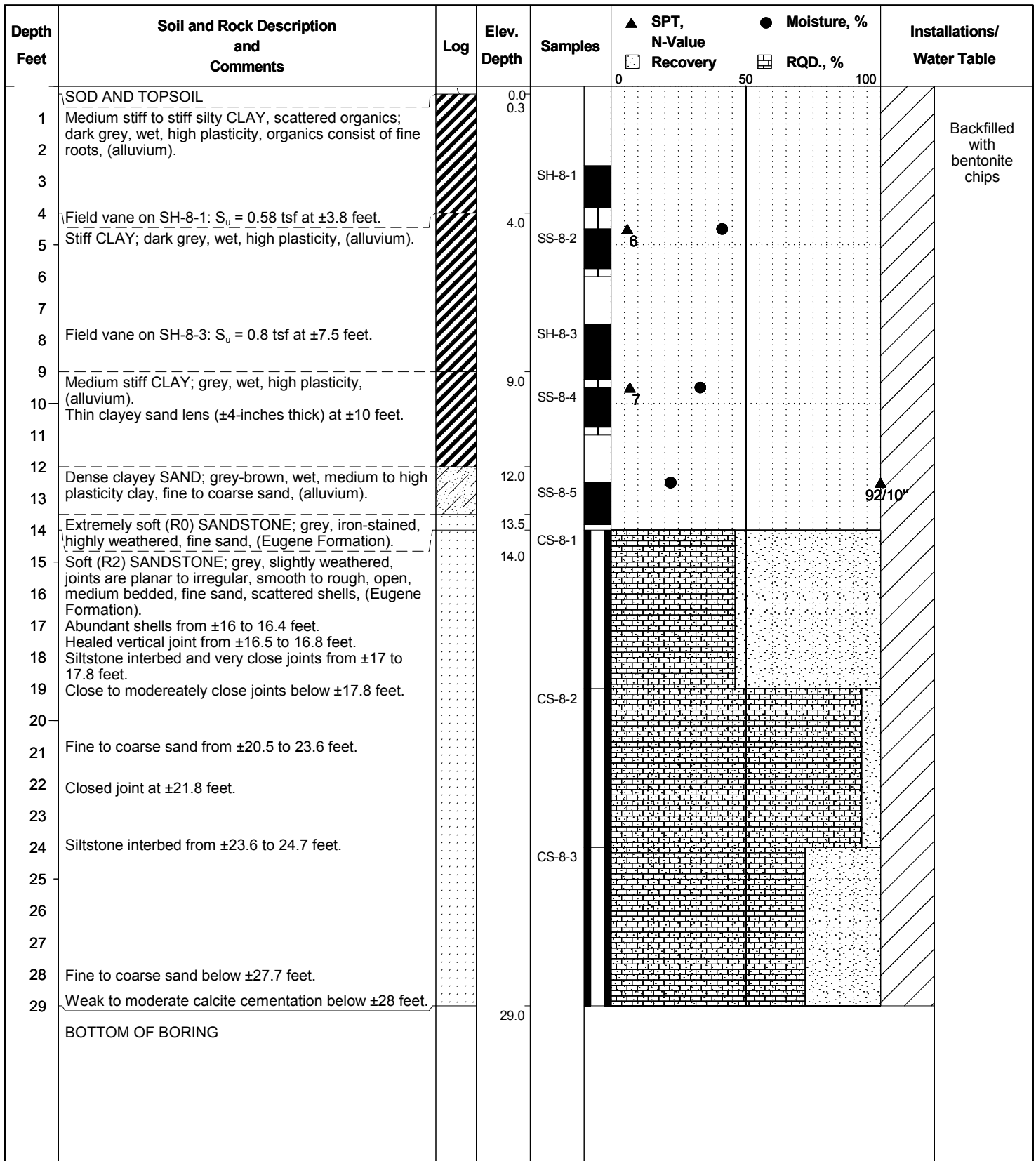
Boring Log: BH-7

Roosevelt Middle School

Eugene, Oregon



Foundation Engineering, Inc.



Project No.: 2141017

Surface Elevation: (Approx.)

Date of Boring: February 25, 2014

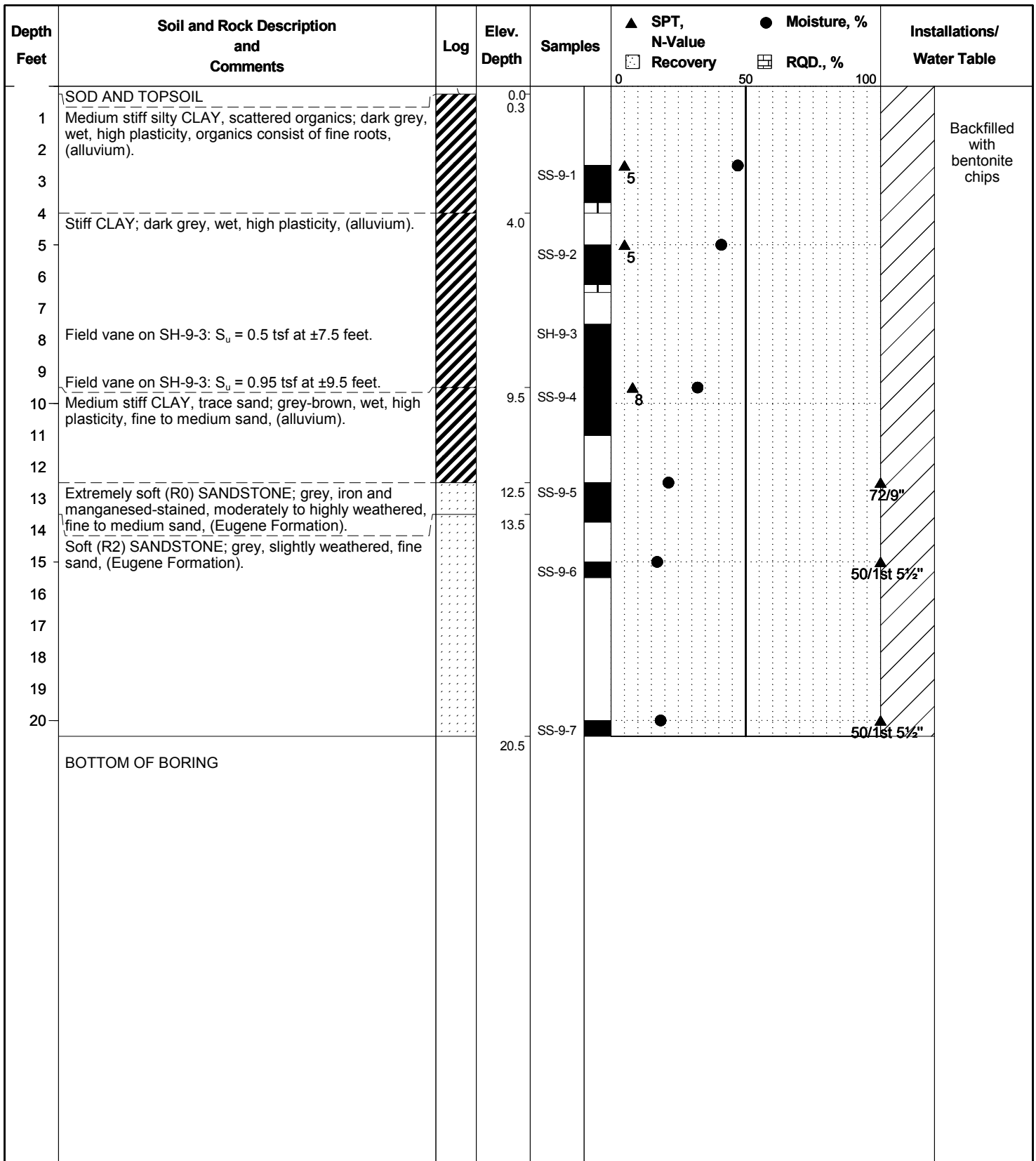
**Boring Log: BH-8**

**Roosevelt Middle School**

**Eugene, Oregon**



**Foundation Engineering, Inc.**



Project No.: 2141017

Surface Elevation: (Approx.)

Date of Boring: February 24, 2014

Boring Log: BH-9

Roosevelt Middle School

Eugene, Oregon



Foundation Engineering, Inc.



Photo 1. BH-8 Box 1



Photo 2. BH-8 Box 2



# Appendix C

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## *Field and Laboratory Test Results*

**Table 1C. Natural Water Contents and Atterberg Limits**

Sample Number	Sample Depth (ft)	Natural Water Content (percent)	LL	PL	PI	USCS Classification
SS-1-1	2.5 – 4	23.8	55	28	27	CH
SS-1-2	5 – 6.5	35.4				
SS-1-4	9.5 – 11	31.7				
SS-2-1	2.5 – 4	32.2				
SS-2-2	5 – 6.5	37.0	81	27	54	CH
SS-2-4	9.5 – 11	33.5				
SS-2-6	15 – 15.5	20.6				
SS-3-1	2.5 – 4	33.5				
SS-3-3	7 – 9.5	36.4				
SS-3-6	15 – 16.5	31.6				
SS-4-1	2.5 – 4	23.9				
SS-4-3	6.5 – 8	35.2	66	24	42	CH
SS-4-5	12 – 12.5	22.5				
SS-4-6	15 – 16	24.6				
SS-4-8	25 – 25.5	18.7				
SS-4-10	35 – 35.5	20.1				
SS-4-11	40 – 40.5	27.4				
SS-5-2	5 – 6.5	27.0	59	21	38	CH
SS-5-3	7.5 – 9	33.3				
SS-5-5	12.5 – 14	24.6				
SS-6-1	2.5 – 4	26.6				
SS-6-4	7.5 – 9	31.8				



**Table 1C. Natural Water Contents and Atterberg Limits**

Sample Number	Sample Depth (ft)	Natural Water Content (percent)	LL	PL	PI	USCS Classification
SS-7-1	2.5 – 4.0	47.6	76	38	38	MH
SH-7-2	5.0 – 7.0	40.1	66	30	36	CH
SS-7-3	7.0 – 8.5	39.6				
SH-7-4	10.0 – 12.0	26.5				
SS-7-5	12.0 – 13.5	25.9				
SS-7-6	15.0 – 15.4	21.0				
SS-7-7	20.0 – 20.3	18.9				
SH-8-1	2.5 – 4.5	44.0				
SS-8-2	4.5 – 6.0	41.2	83	37	46	MH-CH
SH-8-3	7.5 – 9.5	24.2				
SS-8-4	9.5 – 11.0	33.1				
SS-8-5	12.5 – 13.8	22.1				
SS-9-1	2.5 – 4.0	47.0	81	37	44	MH-CH
SS-9-2	5.0 – 6.5	40.9				
SH-9-3	7.5 – 7.5	33.2				
SS-9-4	9.5 – 11.0	32.1	70	27	43	CH
SS-9-5	12.5 – 13.8	21.3				
SS-9-6	15.0 – 15.8	17.1				
SS-9-7	20.0 – 20.4	18.4				

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**Table 2C. Confined Swell (ASTM D2435)**

Sample Number*	Initial Moisture (percent)	Final Moisture (percent)	Wet Density (pcf)	Dry Density (pcf)	Swell (percent)	Test Period (weeks)
SH-3-2	37.6	37.1	118.5	86.1	-0.9	5.5
SH-1-3	27.4	35.3	117.9	92.5	0.8	3
SH-2-3	47.8	37.8	121.2	82.0	-0.5	4
SH-4-2	24.7	24.9	121.0	97.0	-1.6	2

**Table 3C. Unconfined Compression (ASTM D2166)**

Sample Number*	Sample Depth (ft)	Length (in)	Diameter (in)	Corrected Area (in <sup>2</sup> )	Water Content (percent)	Load (lbs)	Compressive Strength (psi)
CS-8-1	18.7-19.6'	5.922	2.392	4.49	11.7	10,349	2,305
CS-8-2	20.4-21.8'	6.081	2.395	4.51	9.9	5,621	1,246

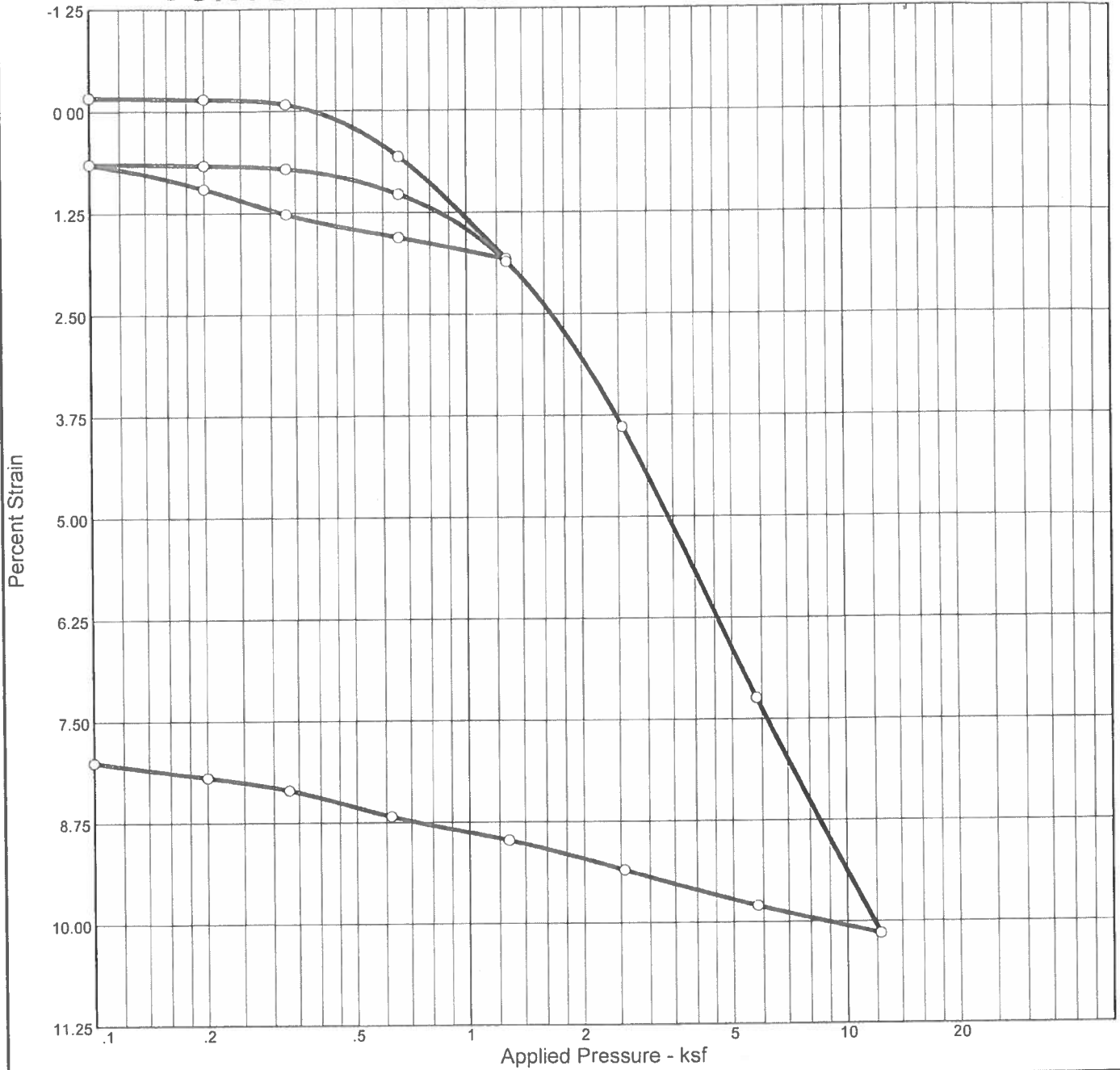
**Table 4C. Summary of Resistivity Testing (ASTM G57)**

Location	Pin Spacing (ft.)	Resistivity ( $\Omega$ -cm)
Between BH-8 and BH-9 (see Figure 2A)	6	839
	8	843
	10	900
Center of West Soccer Field (see Figure 2A)	6	954
	8	812
	10	785
Center of East Soccer Field (see Figure 2A)	4	1532
	6	1264
	8	1149

**Table 5C. pH Test Results (ASTM G51)**

Sample Number	Sample Depth (ft)	Sample Description	pH
SS-8-2	4.5 – 6.0	CLAY	6.4
SS-7-3	7.0 – 8.5	CLAY	6.6
SS-8-3	9.5 – 11.0	CLAY	6.7

# CONSOLIDATION TEST REPORT - ASTM D2435



Natural		Dry Dens. (pcf)	LL	PI	Sp. Gr.	Overburden (ksf)	P <sub>c</sub> (ksf)	C <sub>c</sub>	C <sub>r</sub>	Swell Press. (ksf)	Swell %	e <sub>0</sub>
Sat.	Moist.											
102.3 %	37.2 %	84.3										

<b>MATERIAL DESCRIPTION</b>	<b>USCS</b>	<b>AASHTO</b>

<p><b>Project No.</b> 2146001-502    <b>Client:</b> Foundation Engineering, Inc.; Project #2141017</p> <p><b>Project:</b> Roosevelt Middle School</p> <p><b>Source:</b> 5383                      <b>Sample No.:</b> SH-7-2                      <b>Elev./Depth:</b> 5.0-7.0'</p> <p style="text-align: center;">CONSOLIDATION TEST REPORT - ASTM D2435</p> <p style="text-align: center;"><b>FEI Testing &amp; Inspection, Inc.</b> Corvallis, OR</p>	<p><b>Remarks:</b></p> <p> </p>
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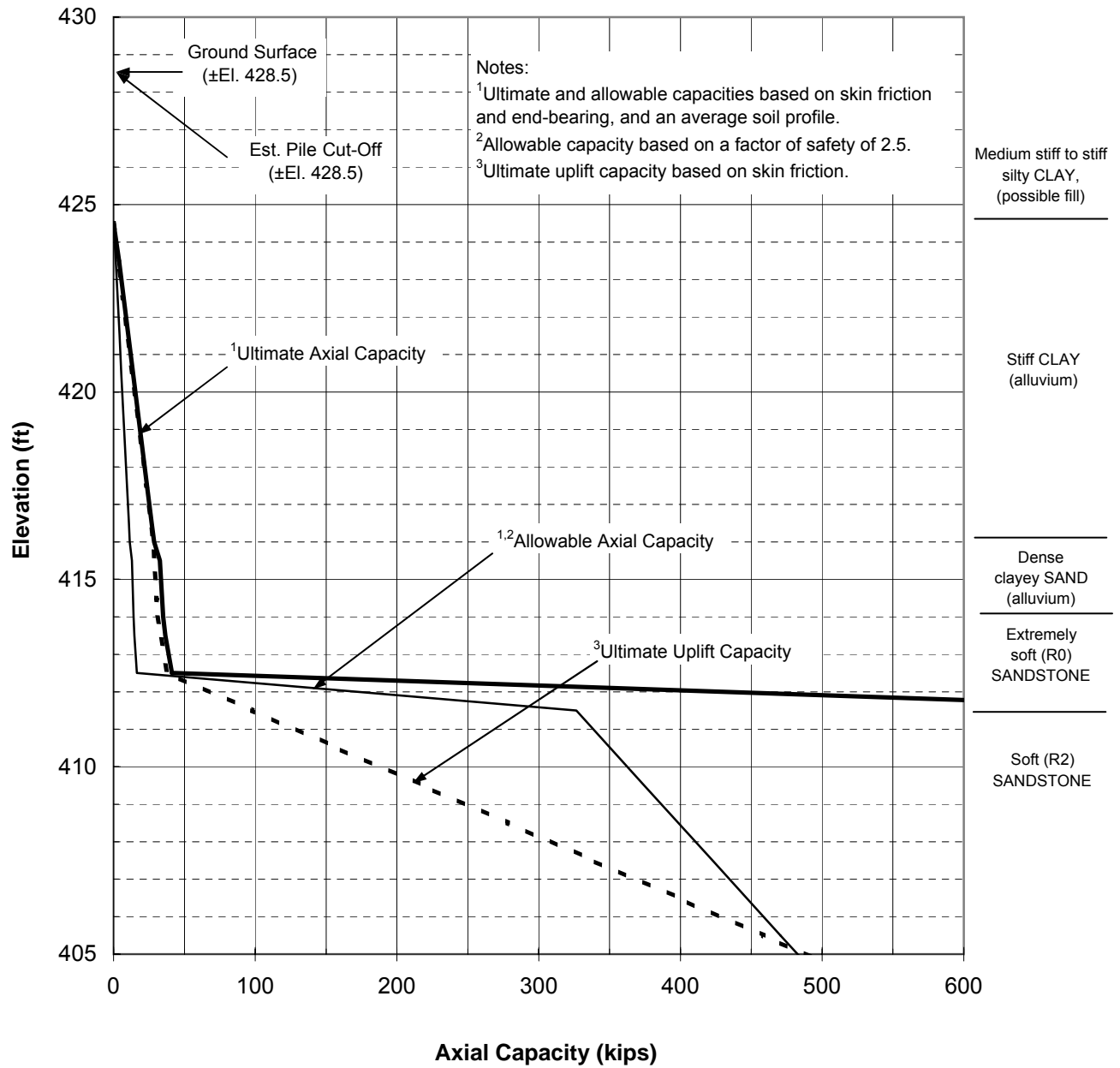
Figure 1C



# Appendix D

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## *Design Calculations*



**FIGURE 1D.**  
**AXIAL CAPACITY vs. ELEVATION**  
**PP12.75x0.375 OPEN-ENDED PILE**  
 Roosevelt Middle School  
 Lane County, Oregon  
 FEI Project 2141017

**Table 1D. LPILE Soil and Rock Parameters**

Elevation <sup>(1)</sup> (ft)	Depth <sup>(2)</sup> (ft)	Soil/Rock Description <sup>(3)</sup>	LPILE p-y Model	Effective Unit Weight $\gamma'$ (pcf)	p-y Modulus K (pci)	Effective Friction Angle $\phi'$ (deg)	Undrained Shear Strength $S_u$ (psf)	Strain $\epsilon_{50}$	Unconfined Compressive Strength $q_u^{(4)}$ (psi)	Weak Rock $K_{rm}$	Weak Rock $E_r^{(4)}$ (psi)	Weak Rock RQD (%)
428.5	0	Stiff silty CLAY	STIFF CLAY w/o free water (Reese)	105	-	-	1,000	0.007	-	-	-	-
424.5	4			105	-	-	1,000-	0.007	-	-	-	-
424.5	4	Stiff CLAY	STIFF CLAY w/o free water (Reese)	105	-	-	1,100	0.007	-	-	-	-
418.5	10			105	-	-	1,100-	0.007	-	-	-	-
418.5	10	Stiff CLAY	STIFF CLAY w/o free water (Reese)	42.6	-	-	1,100	0.007	-	-	-	-
416	12.5			42.6	-	-	1,100	0.007	-	-	-	-
416	12.5	Dense clayey SAND	Sand (Reese)	52.6	125	36	-	-	-	-	-	-
414	14.5			52.6	125	36	-	-	-	-	-	-
414	14.5	Extremely soft (R0) SANDSTONE	Weak Rock (Reese)	72.6	-	-	-	-	100	0.0003	20,000	0
411.5	17			72.6	-	-	-	-	100	0.0003	20,000	0
411.5	17	Soft (R2) SANDSTONE	Strong Rock (Vuggy Limestone)	82.6	-	-	-	-	1,250	-	-	-
398.5	30			82.6	-	-	-	-	1,250	-	-	-

Notes:

1. Top elevation based on the average ground surface elevation.
2. Assumes ground water at  $\pm$ El. 418.5.
3. Soil profile based on BH-1, BH-2, BH-3, BH-7, BH-8, and BH-9.
4.  $q_u$  values for the soft (R2) sandstone stratum obtained from laboratory unconfined compression tests.

**Table 2D. P-Multipliers for Lateral Loading as a Function of Pile Spacing**

Pile Spacing	P-Multiplier 1st Row	P-Multiplier 2nd Row	P-Multiplier 3rd and Consecutive Rows
3d	0.8	0.4	0.3
3.25d	0.83	0.46	0.35
3.5d	0.85	0.51	0.4
3.75d	0.88	0.57	0.45
4d	0.90	0.63	0.5
4.25d	0.93	0.68	0.55
4.5d	0.95	0.74	0.6
4.75d	0.98	0.79	0.65
5d	1.0	0.85	0.7

- Notes: 1. P-multiplier values for 3d and 5d are based on Hannigan et al. 2006 (AASHTO, 2012).  
Other values were linearly interpolated.  
2. Pile spacing is center-to-center.

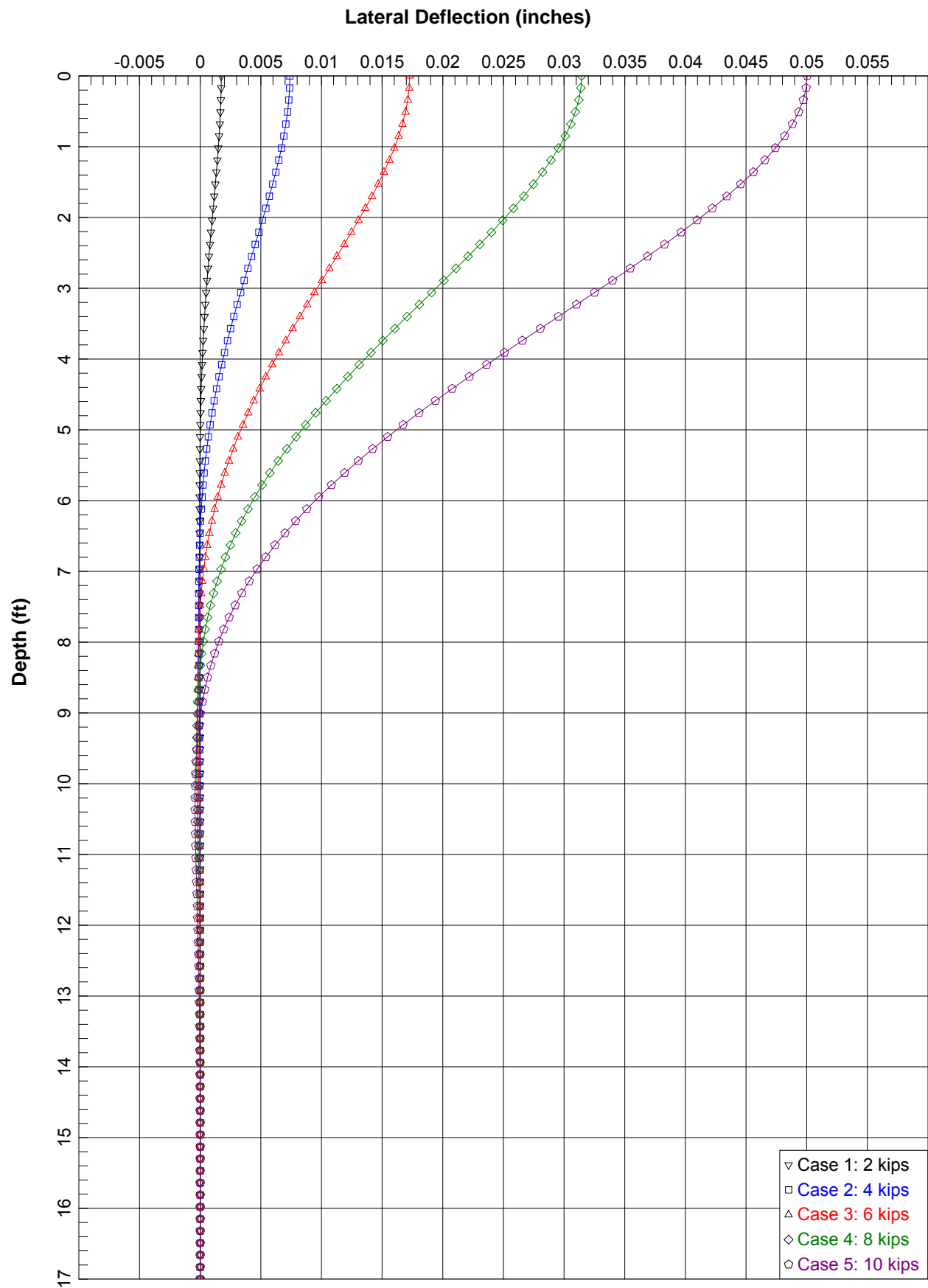


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**Table 3D. Summary of WEAP Input Parameters**

Pile Size	Pile Length (ft)	Embed Length (ft)	Quake (in)		Damping (sec/ft)		%Skin (ITYS)	R <sub>ult</sub> (kips)
			Skin	Toe	Skin	Toe		
PP12.75x0.375	20	17	0.1	0.07	0.2	0.15	12	250

Note: A triangular distribution is assumed for skin friction.





# Appendix E

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## *Seismic Hazard Study*

**ROOSEVELT MIDDLE SCHOOL  
SEISMIC HAZARD STUDY  
EUGENE, OREGON**

**INTRODUCTION**

A seismic hazard study was completed to identify potential geologic and seismic hazards and evaluate the effect those hazards may have on the proposed project. The study fulfills the requirements presented in the 2010 Oregon Structural Specialty Code, Section 1803.7, for site-specific seismic hazard reports for essential and hazardous facilities, and major and special-occupancy structures (OSSC, 2010).

**LITERATURE REVIEW**

Available geologic and seismic publications and maps were reviewed to characterize the local and regional geology and evaluate relative seismic hazards at the site. We also reviewed boring logs from our previous work on-site and nearby geotechnical and seismic investigations completed by FEI in the Eugene area to evaluate the subsurface conditions.

**SEISMIC CONSIDERATIONS**

**Regional Geology**

The site is located at the southern end of the Willamette Valley, which is a broad north-south-trending basin separating the Coast Range to the west from the Cascade Range to the east. In the early Eocene ( $\pm 50$  to 58 million years ago), the Willamette Valley was part of a broad continental shelf extending west from the Western Cascades beyond the present coastline (Orr and Orr, 1999). Basement rock underlying most of the Valley includes Siletz River Volcanics, which erupted as part of a submarine oceanic island-arc. The thickness of the volcanic basement rock is unknown, but is estimated to be  $\pm 3$  to 4 miles (Yeats et al., 1996). The island-arc collided with and was accreted to the western margin of the converging North American plate near the end of the early Eocene. Volcanism subsided and a fore arc basin was created. The basin was then infilled (primarily to the south) with marine sediments of the Flournoy, Yamhill, Spencer and Eugene Formations throughout the late Eocene and Oligocene, and terrestrial sedimentary and volcanic deposits of the late Eocene Fisher Formation, Miocene-Oligocene Little Butte Volcanics and other basaltic flow and volcanoclastic sedimentary rocks (Orr and Orr, 1999; Madin and Murray, 2006; McClaughry et al., 2010).

After emerging from a gradually shallowing ocean, the marine and volcanic formations were covered by terrestrial Columbia River Basalt (middle Miocene;  $\pm 17$  to 10 million years ago). The basalt poured through the Columbia Gorge from northeastern Oregon and southwestern Washington, spreading as far south as Salem with some flows reaching west to the Pacific Ocean. Uplift and tilting of the Coast Range and the Western Cascades during the late Miocene formed the

trough-like configuration of the Willamette Valley. Thick layers of Pleistocene and Holocene fluvial and floodplain deposits blanket the Columbia River Basalt (northern Willamette Valley) and older Tertiary deposits (Orr and Orr, 1999).

Catastrophic flood deposits placed during the Pleistocene (over 15,000 years ago) mantle the Willamette Valley floor as far south as Eugene (Hampton, 1972; Yeats et al., 1996). These deposits originated from a series of glacial-outburst floods that periodically drained Glacial Lake Missoula in western Montana. The older deposits, typically found within the Portland Basin, include layers of cobbles/boulders, gravel and sand deposited during a period of time when the river(s) had sufficiently high flow to move large boulders (i.e., erratics). As the floods moved south into the Willamette Valley, the material deposited by floods became finer-grained. In the Southern Willamette Valley, turbid floodwater eventually settled, depositing a relatively thick layer ( $\pm 50$  to 100 feet) of silt and clay known as Willamette Silt (Orr and Orr, 1999; Wiley, 2006).

### **Tectonic Setting**

The Southern Willamette Valley is located  $\pm 130$  miles inland from the surface expression of the Cascadia Subduction Zone (CSZ) (Peterson et al., 1986; Goldfinger et al., 1992; Geomatrix Consultants, 1995). The CSZ is a converging, oblique plate boundary where the Juan de Fuca plate is being subducted beneath the western edge of the North American continent (Geomatrix Consultants, 1995). The CSZ extends from central Vancouver Island in British Columbia, Canada, through Washington and Oregon to Northern California. The CSZ is capable of generating earthquakes within the descending Juan de Fuca plate (intraplate), along the inclined interface between the two plates (interface), or within the overriding North American Plate (crustal) (Weaver and Shedlock, 1996). Western Oregon is located in an area of potentially high seismic activity due to its proximity to the CSZ.

### **Local Faulting**

A review of nearby faults was completed to establish the seismic setting and the seismic sources. Numerous concealed and inferred crustal faults are located within  $\pm 20$  miles of Eugene (Yeats et al., 1996; Madin and Murray, 2006). However, none of these faults show any evidence of movement in the last  $\pm 1.6$  million years (Geomatrix Consultants, 1995; USGS, 2006). Four potentially active Quaternary ( $< 1.6$  million years or less) crustal fault zones have been mapped within  $\pm 40$  miles of the site (Geomatrix Consultants, 1995; Personius et al., 2003; USGS, 2006; USGS, 2013) and are listed in Table 1E. The approximate locations of these faults in the central Willamette Valley are shown on Figure 1E (attached) (Personius et al., 2003).

**Table 1E. Potentially Active Quaternary Crustal Faults  
within ± 40 miles of Roosevelt Middle School, Eugene**

<b>Fault Name</b>	<b>Length (miles)</b>	<b>Last Known Activity</b>	<b>Distance from Site (miles)</b>	<b>Slip Rate (mm/yr)</b>
Upper Willamette River (#863)	± 27	< 1.6 million years	± 23 SE	< 0.20
Owl Creek (#870)	± 9	< 750,000 years	± 33 N	< 0.20
Unnamed faults near Sutherlin (#862)	± 17	< 750,000 years	± 33 SW	< 0.20
Corvallis (#869)	± 25	< 1.6 million years	± 37 NW	< 0.20

**Note:** Fault data based on USGS, 2006 and 2013.

The Owl Creek fault is the only fault considered a USGS Class A fault. Class A faults have geologic evidence supporting tectonic movement in the Quaternary, known or presumed to be associated with large-magnitude earthquakes.

**Historic Earthquakes**

No significant interface (subduction zone) earthquakes have occurred on the CSZ in historic times; however, several large-magnitude (>M ~8.0, M = unspecified magnitude scale) subduction zone earthquakes are thought to have occurred in the past few thousand years. This is evidenced by the discovery of tsunami inundation deposits, combined with geologic evidence for episodic subsidence along the Oregon and Washington coasts (Peterson et al., 1993; Atwater et al., 1995). The Oregon Department of Geology and Mineral Industries (DOGAMI) and USGS estimates the maximum magnitude of an interface subduction zone earthquake ranges from moment magnitude (M<sub>w</sub>) 8.5 to M<sub>w</sub> 9.0 (Wang and Leonard, 1996; Wang et al., 1998; Wang et al., 2001; Petersen et al., 2008), and the rupture may potentially occur along the entire length of the CSZ (Weaver and Shedlock, 1996). Interface earthquakes are believed to have an average return period of 400 to 700 years (Nelson and Personius, 1996), with the last event occurring ±314 years ago (January 26, 1700) (Nelson et al., 1995; Satake et al., 1996).

Turbidite deposits in the Cascadia Basin has been investigated recently as a paleoseismic record for the CSZ (Goldfinger et al., 2012). Turbidite findings (based on the last 10,000 years) suggest an average recurrence interval of ±240 years for a large interface earthquake on the southern portion of the CSZ. The estimated recurrence interval for a large interface earthquake on the northern portion of the CSZ is ±500 to 530 years (Goldfinger et al., 2012).

Intraplate (Benioff Zone) earthquakes occur within the Juan de Fuca Plate at depths of  $\pm 28$  to 37 miles (Weaver and Shedlock, 1996). The maximum estimated magnitude of an intraplate earthquake is about  $M_w$  7.5 (Wang et al., 2001). No intraplate earthquakes have been recorded in Oregon in modern times. However, the Puget Sound region of Washington State has experienced three intraplate events in the last  $\pm 65$  years including a surface wave magnitude ( $M_s$ ) 7.1 event in 1949 (Olympia), a  $M_s$  6.5 event in 1965 (Seattle/Tacoma) (Wong and Silva, 1998), and a  $M_w$  6.8 event in 2001 (Nisqually) (USGS, 2001).

Crustal earthquakes dominate Oregon's seismic history. Crustal earthquakes occur within the North American Plate, typically at depths of  $\pm 6$  to 12 miles. The estimated maximum magnitude of the relatively shallow crustal earthquake in the Willamette Valley and adjacent physiographic regions is about  $M_w$  6.5 (Wang and Leonard, 1996; Wang et al., 1998; Wang et al., 2001). Only two major crustal events in Oregon have reached Richter local magnitude ( $M_L$ ) 6: the 1936 Milton-Freewater  $M_L$  6.1 earthquake and the 1993 Klamath Falls  $M_L$  6.0 earthquake (Wong and Bott, 1995). The majority of Oregon's larger crustal earthquakes are in the  $M_L$  4 to 5 range (Wong and Bott, 1995).

Table 2E summarizes earthquakes with a  $M$  of 3.5 or greater that have occurred within a  $\pm 50$ -mile radius of Eugene in the last 181 years (Johnson et al., 1994; ANSS, 2014). Although not listed, several sources make reference to a  $M_L = 4 +$  earthquake ( $MM=V$ ) with an epicenter near Corvallis. The coordinates of this earthquake (44.6 N, 123.2 W) suggest the 1946 or 1947 event was most likely located on the Corvallis fault (Bela, 1979; Yeats et al., 1996). Yeats et al. (1996) and Geomatrix Consultants (1995) also indicate two other earthquakes have been felt near the Corvallis fault. One occurred in 1957 ( $MM=III$ ) and the other occurred in 1961 ( $MM=III-IV$ ).

**Table 2E. Historic Earthquakes within  $\pm 40$ -mile Radius of Eugene**

Year	Month	Day	Hour	Minute	Latitude	Longitude	Depth (miles)	Magnitude
1961	08	19	04	56	44.7	122.5	unknown	$M = 4.5$
1962	09	05	05	37	44.5	122.9	unknown	$M = 3.5$
1988	09	14	04	10	43.8	123.5	Unknown	$M = 5.4$

Note:  $M$  = unspecified magnitude,  $M_b$  = compressional body wave magnitude,  $M_c$  = primary coda magnitude, and  $M_L$  = local Richter magnitude

It should be noted that earthquakes in Oregon were not comprehensively documented until the 1840's (Wong and Bott, 1995). According to Wong and Bott (1995), seismograph stations sensitive to smaller earthquakes ( $M_L \leq 4$  to 5) were not implemented in Northwestern Oregon until 1979 when the University of Washington expanded their seismograph network to Oregon. Prior to 1979, few seismograph stations were installed in Oregon. Oregon State University (Corvallis) likely had the first station installed in 1946 (Wong and Bott, 1995). The local Richter magnitude ( $M_L$ ) of events occurring prior to the establishment of

seismograph stations have been estimated based on correlations between magnitude and Modified Mercalli (MM) intensities. Some discrepancy exists in the correlations.

Distant strong earthquakes felt in the Eugene area are summarized in Table 3E (Noson et al., 1988; Bott and Wong, 1993; Stover and Coffman, 1993; Wiley et al., 1993; Wong and Bott, 1995; Black, 1996; USGS, 2001). None of these events caused significant reportable damage in the Eugene metropolitan area.

**Table 3E. Distant Earthquakes Felt in the Eugene Area**

Earthquake	Modified Mercalli Intensities (MM)
2001 Nisqually, Washington	II-III
1993 Klamath Falls, Oregon	IV
1993 Scotts Mills, Oregon	IV
1965 Seattle-Tacoma, Washington	I-IV
1962 Portland, Oregon	I-IV
1961 Lebanon/Albany, Oregon	IV
1949 Olympia, Washington	IV
1873 Crescent City, California	V

## SEISMIC HAZARDS

The OSSC (2010) Section 1803.7 requires the evaluation of risks from a range of seismic hazards. Geologic and seismic hazard studies by DOGAMI have been completed for Lane County and the Eugene metropolitan area (Black et al., 2000; Burns et al., 2008; DOGAMI, 2014). However, these studies are only a guide and do not have precedence over site-specific evaluations. Our conclusions presented herein regarding the site-specific seismic hazards weigh heavily on our knowledge of the subsurface conditions and site geology based on our on-site explorations and a review of geologic maps and previous geotechnical and seismic hazard studies performed within the project vicinity. Information from the available seismic hazard maps is also provided for comparison.

The relative earthquake hazard is based on the combined effects of ground shaking amplification and earthquake-induced landslides with a range in hazard from Zone A (highest hazard) to Zone D (lowest hazard). Based on the DOGAMI mapping, the site is within Zone D (lowest hazard) for the overall, relative earthquake hazard (Black et al., 2000).



Ground Motion Amplification. Ground motion amplification is the influence of a soil deposit on the earthquake motion. As seismic energy propagates up through the soil strata, the energy is typically increased (i.e., amplified) or decreased (i.e., attenuated) to some extent. The school site is primarily underlain by medium stiff to stiff silty clay to high plasticity clay grading to medium dense clayey sand (fan-delta alluvial deposits) followed by extremely soft to soft (R0 to R2) sandstone of the Eugene Formation. Based on the soil conditions, it is our opinion the risk of ground motion amplification for the site is low, consistent with an OSSC/IBC Site Class C soil profile. This conclusion is consistent with DOGAMI's amplification hazard map, Hazard Zone 1 (low hazard, amplification  $\leq 1$ ) (Black et al., 2000). The relative ground-shaking amplification susceptibility map for Lane County also indicates that there is a low susceptibility to amplification (NEHRP Site Class B) (Burns et al., 2008).

Ground Rupture. We anticipate the risk of ground rupture is low due to lack of known faulting beneath the site. However, hidden and/or deep-seated active faults could remain undetected. Additionally, recent crustal seismic activity cannot always be tied to observable faults. In the event of a catastrophic earthquake with a large seismic moment, inactive faults could potentially be reactivated.

Landslides and Earthquake-Induced Landslides. The site is relatively flat. Therefore, the risk of landslides or earthquake-induced landslides is very low. DOGAMI hazard maps indicate the site has no to very low landslide susceptibility with no identified landslide areas (Black et al., 2000; Burns et al., 2008; DOGAMI, 2014).

Liquefaction and Lateral Spread. Liquefiable soils typically consist of loose, fine-grained sand and non-plastic or low plasticity silt below the ground water table. The explorations indicate the school site is underlain by predominantly stiff, medium plasticity clayey silt to high plasticity clay, followed by medium dense clayey sand. Therefore, the risk of cyclically-induced liquefaction, ground subsidence or a bearing capacity failure beneath the foundation due to liquefaction is very low to negligible, due to the stiffness and plasticity of the fine-grained alluvium. We anticipate the risk of liquefaction in the coarse-grained alluvial clayey sand is also relatively low due to its density and presence of medium to high plasticity clay. The risk of seismically-induced lateral spread is also considered low because of the low liquefaction risk and the low risk of slope instability (discussed above). The relative liquefaction hazard susceptibility map indicates the site is within a low to very low liquefaction susceptibility zone (Burns et al., 2008).

Tsunami/Seiche. Tsunami inundation is not applicable to this site since Eugene is not on the Oregon Coast. Seiche (the back and forth oscillations of a water body during a seismic event) is also not a concern due to the absence of large bodies of water near the site.

## SEISMIC DESIGN

### Design Earthquakes

The OSSC (2010), Section 1803.3.2.1, requires the design of structures classified as essential or hazardous facilities, and major and special-occupancy structures address, at a minimum, the following earthquakes:

- Crustal: A shallow crustal earthquake on a real or assumed fault near the site with a minimum moment magnitude ( $M_w$ ) of 6.0 or the design earthquake ground motion acceleration determined in accordance with the 2010 OSSC Section 1613.
- Intraplate: A deep subduction earthquake (Benioff Zone earthquake) with a moment magnitude ( $M_w$ ) of 7.0 or greater on the seismogenic part of the subducting plate (Juan de Fuca) of the CSZ.
- Interface: A subduction earthquake with a minimum moment magnitude ( $M_w$ ) of 8.5 on the seismogenic part of the interface between the Juan de Fuca and the North American Plates on the CSZ.

The design maximum considered earthquake ground motion maps provided in OSSC 2010 are based on the 2002 maps prepared by USGS for an earthquake with a 2% probability of exceedence in 50 years (i.e., a  $\pm 2,475$ -year return period). USGS released updated maps in 2008.

The upcoming OSSC 2014 will be based on the IBC 2012, which uses modified USGS 2008 maps with a 1% probability of exceedence in 50 years (i.e., a  $\pm 4,975$ -year return period) for design spectral accelerations. The modifications include factors to adjust the spectral accelerations to account for directivity and risk.

The 2002 and 2008 USGS maps were established based on probabilistic studies and include aggregate hazards from a variety of seismic sources. The interactive deaggregations obtained from the USGS National Earthquake Hazard Mapping website indicate crustal earthquakes were included in both studies, but were not considered to be a principal hazard at this site. That is, the crustal source was assumed to comprise less than 10% of the total hazard at the site. The following earthquake magnitudes and source-to-site distances were included in the 2002 USGS maps assuming a 2% probability of exceedence in 50 years (USGS, 2002):

- Subduction:  $M_w$  8.3 earthquake located  $\pm 38$  to 72 miles from the site.
- Subduction:  $M_w$  9.0 earthquake located  $\pm 38$  to 71 miles from the site.

The following earthquake magnitudes and source-to-site distances were included in the 2008 USGS maps assuming a 1% probability of exceedence in 50 years (USGS, 2008):

- Subduction:  $M_w$  8.4 to 8.8 earthquake located  $\pm 36$  miles from the site.
- Subduction:  $M_w$  9.0 to 9.2 earthquake located  $\pm 36$  miles from the site.

The earthquake magnitudes and source-to-site distances used to generate the 2002 and 2008 USGS maps satisfy the requirements of OSSC 2010.

### **Site Response**

We recommend designing the structure using an OSSC/IBC Site Class C. Spectral acceleration response spectra and seismic design parameters for the site were provided in Figure 3A (Appendix A) of the Geotechnical Investigation report. The figure includes response spectra for both the current OSSC 2010 and the upcoming OSSC 2014. The OSSC 2010 response spectrum is based on USGS (2002) maps with a 2% probability of exceedence in a 50-year period. The OSSC 2014 response spectrum is based on modified USGS (2008) maps with a 1% probability of exceedence in a 50-year period.

### **CONCLUSION**

Based on the findings presented herein, it is our opinion there are no geologic or seismic hazards that require mitigation as part of the new school design.

This site-specific seismic hazard investigation for the Roosevelt Middle School in Eugene, Oregon, was prepared by Brooke Running, R.G., C.E.G.

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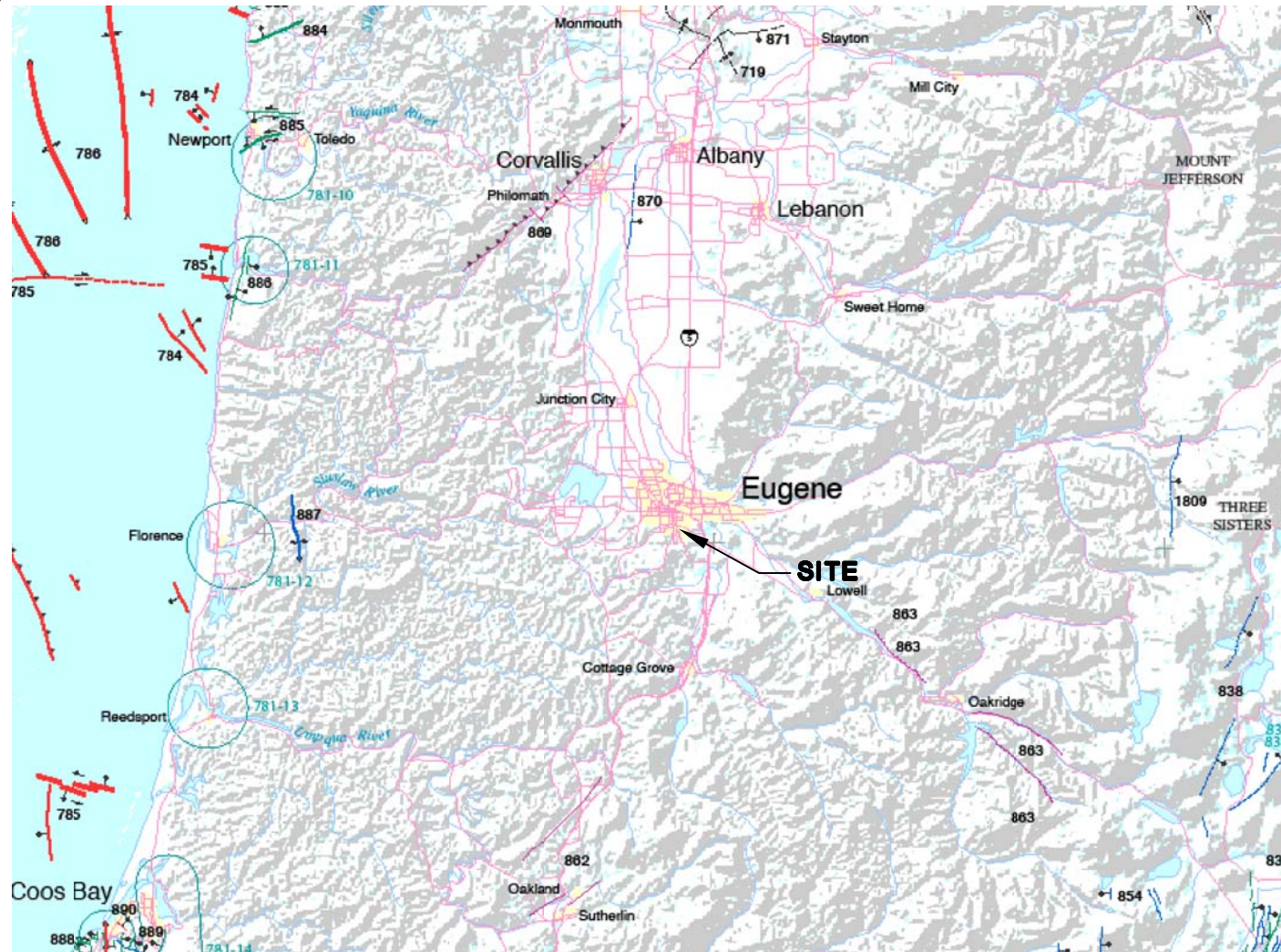
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NOT TO SCALE

LEGEND

- TIME OF MOST RECENT SURFACE RUPTURE**
- Holocene (<10,000 years) or post last glaciation (<15,000 years; 15 ka); no historic ruptures in Oregon to date
  - Late Quaternary (<130,000; post penultimate glaciation)
  - Late and middle Quaternary (<750,000 years; 750 ka)
  - Quaternary, undifferentiated (<1,600,000 years; <1.6 Ma)
  - Class B structure (age or origin uncertain)
- SLIP RATE**
- >5 mm/year
  - 1.0-5.0 mm/year
  - 0.2-1.0 mm/year
  - <0.2 mm/year
- TRACE**
- Mostly continuous at map scale
  - Mostly discontinuous at map scale
  - Inferred or concealed
- STRUCTURE TYPE AND RELATED FEATURES**
- Normal or high-angle reverse fault
  - Strike-slip fault
  - Thrust fault
  - Anticlinal fold
  - Synclinal fold
  - Monoclinial fold
  - Plunge direction of fold
  - Fault section marker
- DETAILED STUDY SITES**
- Trench site
  - Subduction zone study site
- CULTURAL AND GEOGRAPHIC FEATURES**
- Divided highway
  - Primary or secondary road
  - Permanent river or stream
  - Intermittent river or stream
  - Permanent or intermittent lake

NOTES:

1. PORTION OF MAP BASED ON MAP OF QUATERNARY FAULTS AND FOLDS IN OREGON (PERSONIUS ET AL., 2003).
2. SEE SITE SPECIFIC HAZARD STUDY FOR A DISCUSSION OF LOCAL FAULTING.
3. FAULTS: #862= UNNAMED FAULTS NEAR SUTHERLIN; #863= UPPER WILLAMETTE RIVER; #869= CORVALLIS; AND #870= OWL CREEK.



**FOUNDATION ENGINEERING INC.**  
PROFESSIONAL GEOTECHNICAL SERVICES

820 NW CORNELL AVENUE  
CORVALLIS, OR 97330-4517  
BUS. (541) 757-7645 FAX (541) 757-7650

DATE MAR. 2014  
DWN. BKR  
APPR. \_\_\_\_\_  
REVIS. \_\_\_\_\_  
PROJECT NO. \_\_\_\_\_  
2141017

**QUATERNARY CRUSTAL FAULT MAP**  
**SOUTHERN WILLAMETTE VALLEY**  
ROOSEVELT MIDDLE SCHOOL  
EUGENE, OREGON

FIGURE NO.  
**1E**



**BID FORM**

**BID FOR:** Roosevelt Middle School Replacement CIP Number: 410.566.001  
 Submitted to: Facilities Management Bid Deadline: 2:00 PM, March 19, 2015  
 Eugene School District 4J  
 715 West Fourth Avenue3  
 Eugene, Oregon 97402

Submitted by: \_\_\_\_\_  
 (Company Name)

**BASE BID**

The undersigned proposes to furnish all material, equipment, and labor required for the complete project, and to perform all work in strict accordance with the Contract Documents for the lump sum prices indicated below with completion occurring on or prior to the dates indicated:

**BASE BID:**

Bid: \_\_\_\_\_ \$ \_\_\_\_\_  
 (Words) (Figures)

**ALTERNATES**

The undersigned proposes to furnish all material, equipment, and labor required for the following alternates as described in Section 01 23 00 - Alternates:

- Alternate No. A1: Standing Seam Metal Roofing Add \$ \_\_\_\_\_
- Alternate No. A2: Sports Field Upgrade Add \$ \_\_\_\_\_
- Alternate No. A3: Covered Bike Storage Add \$ \_\_\_\_\_
- Alternate No. A4: Multi-Modal Sidewalk at 24<sup>th</sup> Avenue Add \$ \_\_\_\_\_
- Alternate No. A5: Rainwater Harvesting System Add \$ \_\_\_\_\_

The Owner reserves the right to exercise any or all alternates as its sole discretion within 60 days of the date of receipt of bids.

**UNIT PRICES**

The following Unit Prices as described in Section 01 22 00 are submitted by the Undersigned as a proposed basis for additive or deductive adjustments to the Bid Amount in the event quantity changes are required for the items listed. It is understood and agreed that these Unit Prices are separately subject to acceptance by the Owner and will thereafter be entered into the Agreement. The Unit Prices are to include all labor, travel and material costs.

- Item 1: Over-Excavation and Back-Fill \$ \_\_\_\_\_ / Cubic Yard
- Item 2: Additional Length of Piles \$ \_\_\_\_\_ / Foot of Pile Length

The Unit Prices are submitted as a proposed basis for additive or deductive adjustments to the Bid Amount in the event quantity changes are required for the items listed. It is understood and agreed that these Unit Prices are separately subject to acceptance by the Owner and may thereafter be entered into the Agreement.

**TIME**

The undersigned agrees, if awarded the Contract, to substantially complete all Base Bid work and accepted Alternates on or before the dates specified in Section 01 10 00.

**BID SECURITY**

Accompanying herewith is Bid Security, which is not less than ten percent (10%) of the total amount of the Base Bid.

**STIPULATIONS**

The undersigned acknowledges the liquidated damages provision included in the Supplementary Conditions.

The undersigned agrees, if awarded the contract, to comply with the provisions of Oregon Revised Statutes 279C.800 through 279C.870 pertaining to the payment of prevailing rates of wage

The undersigned agrees, if awarded the Contract, to execute and deliver to the Owner within ten (10) working days after receiving contract forms, an Agreement and a satisfactory Performance Bond and Payment Bond each in an amount equal to 100 percent (100%) of the Contract Sum.

For every bid \$100,000 or greater, all Contractors and Subcontractors shall have a public works bond, in the amount of \$30,000, filed with the Construction Contractors' Board (CCB), before starting work on the project, unless exempt. Contractor agrees to provide a copy of the Contractor's BOLI Public Works bond with the signed Agreement as Specified in the Supplementary Conditions.

The undersigned agrees that the Bid Security accompanying this proposal is the measure of liquidated damages which the Owner will sustain by the failure of the undersigned to execute and deliver the above named agreement and bonds; and that if the undersigned defaults in executing that agreement within ten (10) days after forms are provided or providing the bonds, then the Bid Security shall become the property of the Owner; but if this proposal is not accepted within sixty (60) days of the time set for the opening of bids, or if the undersigned executes and delivers said agreement and bonds, the Bid Security shall be returned.

By submitting this Bid, the Bidder certifies that the Bidder:

- a) has available the appropriate financial, material, equipment, facility and personnel resources and expertise, or the ability to obtain the resources and expertise, necessary to meet all contractual responsibilities;
- b) has a satisfactory record of past performance;
- c) has a satisfactory record of integrity, and is not disqualified under ORS 279C.440;
- d) is qualified legally to contract with the Owner; and
- e) will promptly supply all necessary information in connection with any inquiry the Owner may make concerning the responsibility of the Bidder.

Prior to award of a Contract, the Bidder shall submit appropriate documentation to allow the Owner to determine whether or not the Bidder is "responsible" according to the above criteria.

The contractor agrees with the provisions of Oregon Revised Statutes 279C.505, which requires that the contractor shall demonstrate it has established a drug-testing program for employees and will require each subcontractor providing labor for the Project to do the same.

The undersigned has received addenda numbers \_\_\_\_\_ to \_\_\_\_\_ inclusive and has included their provisions in the above Bid amounts.

The undersigned has visited the site to become familiar with conditions under which the Work is to be performed and has correlated the Bidder's personal observations with the requirements of the proposed Contract Documents.

The undersigned certifies that the Bidder is a \_\_\_\_\_ Bidder under ORS. ("Resident" or "Non-resident", to be filled in by Bidder)

Names of Firm:

\_\_\_\_\_

Street Address:

\_\_\_\_\_

(City) (State) (Zip)

Telephone Number: \_\_\_\_\_ FAX Number: \_\_\_\_\_

Email Address: \_\_\_\_\_

Signed By: \_\_\_\_\_

(Signature of Authorized Official. If bid is from a partnership, one of the partners must sign bid).

Printed Name: \_\_\_\_\_

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

Official Capacity: \_\_\_\_\_

If corporation, attest: \_\_\_\_\_ Date: \_\_\_\_\_

(Secretary of Corporation)

SEAL (If Corporate)

\_\_\_\_\_ Corporation  
\_\_\_\_\_ Partnership  
\_\_\_\_\_ Individual

Enclosed: Bid Security, Non-Discrimination Requirement, Non-Collusion Affidavit, First-Tier Subcontractor Disclosure Form

**NON-DISCRIMINATION REQUIREMENT**

Contractor certifies that the Contractor has not discriminated against minorities, women or emerging small business enterprises in obtaining any required subcontracts.

The Contractor agrees not to discriminate against any client, employee, or applicant for employment or for services, because of race, color, religion, sex, national origin, physical or mental handicap, sexual orientation or age, unless based upon bona fide occupational qualifications, and that they are otherwise in compliance with all federal, state and local laws prohibiting discrimination, with regard to, but not limited to, the following: Employment upgrading, demotion or transfer; Recruitment or recruitment advertising; Layoffs or termination; Rates of pay or other forms of compensation; Selection for training; Rendition of services. It is further understood that any vendor who is in violation of this clause shall be barred forthwith from receiving awards of any purchase order from the School District, unless a satisfactory showing is made that discriminatory practices have terminated and that a recurrence of such acts is unlikely.

FIRM NAME \_\_\_\_\_

ADDRESS \_\_\_\_\_

TELEPHONE \_\_\_\_\_

BY \_\_\_\_\_  
(Company or Firm Officer)

BY \_\_\_\_\_  
(Type or Print Name)

**NON-COLLUSION AFFIDAVIT**

STATE OF \_\_\_\_\_)

County of \_\_\_\_\_)

I state that I am \_\_\_\_\_ of \_\_\_\_\_  
(Title) (Name of Firm)

and that I am authorized to make this affidavit on behalf of my firm, and its owners, directors, and officers. I am the person responsible in my firm for the price(s) and the amount of this bid.

I state that:

(1) The price(s) and amount of this bid have been arrived at independently and without consultation, communication or agreement with any other contractor, bidder or potential bidder, except as disclosed on the attached appendix.

(2) That neither the price(s) nor the amount of this bid, and neither the approximate price(s) nor approximate amount of this bid, have been disclosed to any other firm or person who is a bidder or potential bidder, and they will not be disclosed before bid opening.

(3) No attempt has been made or will be made to induce any firm or person to refrain from bidding on this contract, or to submit a bid higher than this bid, or to submit any intentionally high or noncompetitive bid or other form of complementary bid.

(4) The bid of my firm is made in good faith and not pursuant to any agreement or discussion with, or inducement from, any firm or person to submit a complementary or noncompetitive bid.

(5) \_\_\_\_\_, its affiliates, subsidiaries, officers, directors and  
(Name of my Firm)  
employees are not currently under investigation by any governmental agency and have not in the last four years been convicted of or found liable for any act prohibited by State or Federal law in any jurisdiction, involving conspiracy or collusion with respect to bidding on any public contract, except as described on the attached appendix.

I state that \_\_\_\_\_ understands and acknowledges that the above  
(Name of my Firm)  
representations are material and important, and will be relied on by School District 4J in awarding the contract(s) for which this bid is submitted. I understand and my firm understands that any misstatement in this affidavit is and shall be treated as fraudulent concealment from School District 4J of the true facts relating to the submission of bids for this contract.

\_\_\_\_\_  
(Authorized Signature)

Sworn to and subscribed before me this \_\_\_\_\_ day of \_\_\_\_\_, 2015

\_\_\_\_\_  
(Notary Public for Oregon)

My Commission Expires: \_\_\_\_\_

**END OF BID FORM**

**FIRST-TIER SUBCONTRACTOR DISCLOSURE FORM**

**PROJECT:** Roosevelt Middle School

**CIP NUMBER: 410.566.001**

**TO:** Kathi Hernandez, Facilities Management Assistant  
Eugene School District 4J  
715 West Fourth Avenue  
Eugene, Oregon 97402

**BID SUBMISSION DEADLINE: Date: March 19, 2015 Time: 2:00 PM**

**SUBMITTAL REQUIREMENTS**

Subcontractor disclosure is required on all public improvement contracts greater than \$100,000.

This form must be submitted at the location specified in the Invitation to Bid on the advertised bid closing date and within two working hours after the advertised bid closing time.

List below the name of each subcontractor that will be furnishing labor or labor and materials, and that is required to be disclosed, the category of work that the subcontractor will be performing, and the dollar value of the subcontract. Enter "NONE" if there are no subcontractors that need to be disclosed. (ATTACH ADDITIONAL SHEETS IF NEEDED.)

SUBCONTRACTOR	DOLLAR VALUE	CATEGORY OF WORK
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

The above listed first- tier subcontractor(s) are providing labor, or labor and material, with a Dollar Value equal to or greater than:

- a) 5% of the total Contract Price, but at least \$15,000. [If the Dollar Value is less than \$15,000 do not list the subcontractor above.]
- b) \$350,000 regardless of the percentage of the total Contract Price

Failure to submit this form by the disclosure deadline will result in a non-responsive bid. A non-responsive bid will not be considered for award.

**Form submitted by (Bidder Name):** \_\_\_\_\_

**Contact Name:** \_\_\_\_\_ **Phone:** \_\_\_\_\_

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

END OF DOCUMENT

**FORM OF AGREEMENT**

**PART 1 GENERAL**

STANDARD FORM

The form of Agreement will be executed on AIA Form A101, Standard Form of Agreement Between Owner and Contractor, 2007 edition, which is included by reference. The document, as edited by Owner, follows.

**END OF DOCUMENT 00 52 13**

# DRAFT AIA® Document A101™ – 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 « » in the year « »  
(In words, indicate day, month and year.)

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

« »  
« »  
« »  
« »

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

« »  
« »  
« »  
« »

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

«»  
« »  
« »

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

« »  
« »  
« »  
« »

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.

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

AIA Document A201™-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.

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## TABLE OF ARTICLES

- 1 THE CONTRACT DOCUMENTS
- 2 THE WORK OF THIS CONTRACT
- 3 DATE OF COMMENCEMENT AND SUBSTANTIAL COMPLETION
- 4 CONTRACT SUM
- 5 PAYMENTS
- 6 DISPUTE RESOLUTION
- 7 TERMINATION OR SUSPENSION
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### 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.

«Work may commence at project site upon receipt of a Notice to Proceed from Owner. »

§ 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 « » ( « » ) days from the date of commencement, or as follows:

«The Contractor shall achieve Substantial Completion of the entire Work not later than »

Portion of Work

Substantial Completion Date

, subject to adjustments of this Contract Time as provided in the Contract Documents.

«The agreed amount of Liquidated Damages is XXX Hundred and 00/100 Dollars (\$X00.00) per each calendar day. Refer to Supplementary Conditions in the Project Manual, Section 00 73 00, Page »

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

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

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

Item	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:

«Payment will be made within 15 days of receipt on an acceptable Application for Payment by School District 4J’s Financial Services Office. »

§ 5.1.3  
Not used.

§ 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 ninety-five percent (95%) of 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
- .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 DISPUTE RESOLUTION

Refer to Section 00 72 13 General Conditions AIA Document A201-2007, Articles 15.3 & 15.4; as modified by Section 00 73 00, Supplementary Conditions, in the Project Manual.

**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.)*

« » % « »

§ 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 are those contained in the Project Manual dated :

Document	Title	Pages
00 73 00	Supplementary Conditions	16
00 73 43	BOLI Prevailing Wage Rates, eff.	1
	Performance Bond and Materials and Labor Payment Bond	

§ 9.1.4 The Specifications are those contained in the Project Manual dated as in Section 9.1.3 and are as follows: *(Either list the Specifications here or refer to an exhibit attached to this Agreement.)*

<< >>

Section	Title	Date	Pages

§ 9.1.5 The Drawings are as follows, and are dated unless a different date is shown below: *(Either list the Drawings here or refer to an exhibit attached to this Agreement.)*

<< >>

Number	Title	Date

§ 9.1.6 The Addenda, if any:

Number	Date	Pages

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:

<< >>

- 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.)*

<< >>

## 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, and as modified in Section 00 73 00, Supplementary Conditions, in the Project Manual.

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)

FOR  
BY  
AIA

**GENERAL CONDITIONS**

**PART 1 GENERAL**

**1.01 STANDARD FORM**

- A. “General Conditions of the Contract for Construction” AIA Document A-201, 2007 Edition, immediately following, are part of these specifications.
- B. The Contractor and all Subcontractors shall read and be governed by them.

**1.02 CONFLICTS**

- A. In the case of conflicts between the “General Conditions” and these Specifications, the Specifications govern.

**END OF DOCUMENT**



**AIA**<sup>®</sup>

# Document A201<sup>™</sup> – 2007

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

for the following **PROJECT:**

*(Name and location or address)*

Blank AIA Documents

**THE OWNER:**

*(Name, legal status and address)*

**THE ARCHITECT:**

*(Name, legal status and address)*

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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.

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§ 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

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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

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the operations. The Contractor shall continue to suspend such operations until otherwise instructed by the Owner but shall continue with all other operations that do not affect those remains or features. Requests for adjustments in the Contract Sum and Contract Time arising from the existence of such remains or features may be made as provided in Article 15.

### **§ 3.8 ALLOWANCES**

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

**§ 3.8.2** Unless otherwise provided in the Contract Documents,

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

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

### **§ 3.9 SUPERINTENDENT**

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

**§ 3.9.2** The Contractor, as soon as practicable after award of the Contract, shall 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.

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### § 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 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.

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§ 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

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.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 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.

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## **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;

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- .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.

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**§ 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

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- .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

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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.

#### § 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

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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 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.

§ 12.2.3 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.

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§ 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;

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- .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.

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**§ 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.

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§ 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.

## **Additions and Deletions Report for AIA<sup>®</sup> Document A201<sup>™</sup> – 2007**

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

Note: This Additions and Deletions Report is provided for information purposes only and is not incorporated into or constitute any part of the associated AIA document. This Additions and Deletions Report and its associated document were generated simultaneously by AIA software at 10:34:33 on 02/19/2015.

**PAGE 1**

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## ***Certification of Document's Authenticity***

***AIA® Document D401™ – 2003***

I, \_\_\_\_\_, hereby certify, to the best of my knowledge, information and belief, that I created the attached final document simultaneously with its associated Additions and Deletions Report and this certification at 10:34:33 on 02/19/2015 under Order No. 2403580246\_1 from AIA Contract Documents software and that in preparing the attached final document I made no changes to the original text of AIA® Document A201™ – 2007, General Conditions of the Contract for Construction, as published by the AIA in its software, other than those additions and deletions shown in the associated Additions and Deletions Report.

\_\_\_\_\_  
*(Signed)*

\_\_\_\_\_  
*(Title)*

\_\_\_\_\_  
*(Dated)*

**SUPPLEMENTARY CONDITIONS  
FOR GENERAL CONDITIONS FOR THE CONTRACT FOR CONSTRUCTION**

**PART 1 GENERAL**

The following supplements modify, change, delete from or add to AIA Document A201, General Conditions of the Contract for Construction 2007 Edition. Where any part of the AIA General Conditions is amended, voided, or superseded by the Supplementary Conditions, the unaltered provisions shall remain in effect.

1.1 ARTICLE 1 GENERAL PROVISIONS

A. BASIC DEFINITIONS

1. Add the following Subparagraphs:

1.1.9 ARCHITECT/ENGINEER

Where the term ARCHITECT is used in the Bidding documents, Contract documents, Addenda, Change Orders or other documents related to this contract it shall be defined as either "Architect" or "Engineer" depending upon which design professional has prepared the document in question. When the project has been designed and initiated under the direction of a licensed engineer, the term ENGINEER shall be substituted for the term "Architect" throughout all documents.

1.1.10 MISCELLANEOUS DEFINITIONS

- .1 "Provide:" Furnish and install, or furnish labor and materials required for installation, ready for use and in accordance with the Contract Documents.
- .2 "As shown:" As indicated, as detailed, as noted, or words of similar import refer to Contract Documents.
- .3 "Selected:" As selected by the Architect.
- .4 "Approved:" Approved by Architect.
- .5 "For Approval:" For the Architect's approval.

B. CORRELATION AND INTENT OF THE CONTRACT DOCUMENTS

1. Add the following to Subparagraph 1.2.1:

1.2.1.1 In the event of conflicts or discrepancies among the Contract Documents, interpretations will be based on the following priorities.

- 1. The Agreement.
- 2. Addenda, with those of later date having precedence over those of earlier date.
- 3. The Supplementary Conditions.
- 4. The General Conditions of the Contract for Construction.
- 5. Division 1 of the Specifications.
- 6. Drawings and Divisions 2- 49 of the Specifications.

In the case of conflicts or discrepancies between Drawings and Divisions 2- 49 of the Specifications or within either Document not clarified by Addendum, the Architect will determine which takes precedence in accordance with Subparagraph 4.2.11.

2. Add the following Subparagraphs:

1.2.4 If work is required in such a manner to make it impossible to produce first class work or should discrepancies appear among Contract Documents, request interpretation before proceeding with work. If Contractor fails to make such request, the Contractor will thereafter be expected to carry out work in satisfactory manner.

1.2.5 Reference to codes, standard specifications, or other standards means and intends latest edition of such documents and/or adopted as of bid date. Where brand name products are specified and no installation instructions given herein, install product in accordance with the manufacturer's specifications and instructions, latest edition.

1.2.6 No provision of any reference standard specification, manual or code shall change the privileges or responsibilities of Owner, Architect, or Contractor, or any of their consultants, agents or employees from those set forth in the Contract Documents, nor shall it be effective to assign to Architect, or any of Architect's consultants, agents or employees, any duty or authority to supervise or direct the furnishing or performance of the work or any duty or authority to undertake responsibility contrary to the provision of the Contract Documents.

1.2.7 Sections of Division 1, General Requirements govern the execution of all sections of the specifications.

## 1.2 ARTICLE 2 OWNER

### A. 2.1 GENERAL

1. Add the following Subparagraph:

2.1.3 The Owner is the Eugene School District 4J, 200 North Monroe Street, Eugene, Oregon 97402, (541) 790-7417.

The Owner's representative is Kirk Gebb, Project Manager, 715 West Fourth Avenue, Eugene, OR 97402.

### B. INFORMATION AND SERVICES REQUIRED OF THE OWNER

1. Delete Subparagraph 2.2.5 and substitute the following:

2.2.5 The Contractor will be furnished free of charge up to ten (10) copies of the Contract Documents. The Owner will furnish additional copies requested by the Contractor at the cost of reproduction, postage and handling.

## 1.3 ARTICLE 3 CONTRACTOR

### A. 3.1 GENERAL

1. Delete the second sentence to Subparagraph 3.1.1, and add the following:

The Contractor and each subcontractor shall maintain for the duration of the Project a registration with the Oregon State Construction Contractor's Board.

2. Add the following Subparagraph 3.1.4

3.1.4 The Contractor is required to demonstrate that an employee drug testing program is in place.

3. Add the following Subparagraph 3.1.5

3.1.5 The Contractor certifies that the Contractor is not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participating in this Contract by any Federal department or agency. If requested by the Eugene 4J School District, the Contractor shall complete a Certification Regarding Debarment, Suspension, Ineligibility, and Voluntary Exclusion form. Any such form completed by the Contractor for this Contract shall be incorporated into this Contract by reference.

### B. 3.2 REVIEW OF CONTRACT DOCUMENTS AND FIELD CONDITIONS BY CONTRACTOR

1. Delete the last sentence to Subparagraph 3.2.4, and add the following:

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, unless the Contractor recognized such error, inconsistency, omission or difference and knowingly failed to report it to the Architect.

C. 3.3 SUPERVISION AND CONSTRUCTION PROCEDURES

1. Add the following Subparagraphs:

3.3.4 The Contractor shall review with all Subcontractors, construction means, methods and materials to be used to verify their compliance with all safety standards and laws and be responsible for compliance with same to insure safe, hazard free conditions for all persons visiting or working on the entire project.

3.3.5 The Contractor shall comply with the provisions of Oregon Revised Statutes and 4J Board Policy. Attention is directed to ORS 279A and 279C, Public Contracting Code.

D. 3.4 LABOR AND MATERIALS

1. Add the following Subparagraphs:

3.4.4 PAYMENT OF LABORERS AND MATERIALMEN, CONTRIBUTIONS TO INDUSTRIAL ACCIDENT FUND, LIENS AND WITHHOLDING TAXES: The Contractor shall: (1) Make payment promptly, as due, to all persons supplying to such contractor labor or material for the prosecution of the Work provided for in such contract. (2) Pay all contributions or amounts due the Industrial Accident Fund from such Contractor or subcontractor incurred in the performance of the contract. (3) Not permit any lien or claim to be filed or prosecuted against the state, county, school district, municipality, municipal corporation or subdivision thereof, on account of any labor or material furnished. (4) Pay to the Department of Revenue all sums withheld from employees pursuant to ORS 316.167.

3.4.5 HOURS OF LABOR: No person shall be employed for more than ten hours in any one day, or 40 hours in any one week, except in the cases of necessity, emergency, or where the public policy absolutely requires it, and in such cases the person so employed shall be paid at least time and a half of the regular pay for all time worked.

.1 For all overtime in excess of eight hours a day or 40 hours in any one week when the work week is five consecutive days, Monday through Friday; or

.2 For all overtime in excess of 10 hours a day or 40 hours in any one week when the work week is four consecutive days, Monday through Friday; and

.3 For all work performed on Saturday and on any legal holiday specified in ORS 279C.540.

.4 Worker claims for overtime, in order to be considered, must be filed with the Contractor within 90 days from the completion of the contract, in accordance with ORS 279C.545.

The Contractor shall give notice to employees who work on a public contract in writing, either at the time of hire or before commencement of work on the contract, or by posting a notice in a location frequented by employees, of the number of hours per day and days per week the employees may be required to work.

3.4.6 PAYMENT FOR MEDICAL CARE AND PROVIDING WORKERS' COMPENSATION: The Contractor shall promptly, as due, make payment to any person, co-partnership, association or corporation, furnishing medical, surgical and hospital care or other needed care and attention, incident to sickness or injury, to the employees of such Contractor, of all sums which the Contractor agrees to pay for such services and all moneys and sums which the Contractor collected or deducted from the wages of employees pursuant to any law, contract or agreement for the purpose of providing or paying for such service. All employers working under this contract are subject employers and must comply with ORS 656.017.

3.4.7 PREVAILING WAGE RATES: When the total price of the Project is \$50,000 or more, each worker in each trade or occupation employed in the performance of this Contract either by the contractor, subcontractor or other person doing or contracting to do contracting for the whole or any part of the Work on the Contract shall be paid not less than the applicable state prevailing rate of wage. This provision applies to all contracts, regardless of the price of the individual contract, as long as the combined price of all contracts awarded on the Project is \$50,000 or more.

a. The existing Oregon prevailing rate of wage in effect at the time the specifications are first advertised for bid solicitations is the applicable rate.

- b. The Owner will pay the public works fee to Oregon Bureau of Labor and Industries.
- c. Certification of rate or wage by Contractor or Subcontractor (ORS 279C.845):
  - .1 The contractor or the contractor's surety and every subcontractor or the subcontractor's surety shall file certified statements with the public agency in writing, on a form prescribed by the Commissioner of the Bureau of Labor and Industries, certifying the hourly rate of wage paid each worker whom the contractor or the subcontractor has employed upon the public works, and further certifying that no worker employed upon the public works has been paid less than the applicable state prevailing rate of wage or less than the minimum hourly rate of wage specified in the contract. The certificate and statement shall be verified by the oath of the contractor or the contractor's surety or subcontractor or the subcontractor's surety that the contractor or subcontractor has read the statement and certificate and knows the contents thereof and that the same is true to the contractor or subcontractor's knowledge. The certified statements shall set out accurately and completely the payroll records for the prior week, including the name and address of each worker, the worker's correct classification, rate of pay, daily and weekly number of hours worked, deductions made, and actual wages paid.
  - .2 If the Contractor does not file certified payroll as required (at least once per month) the Owner will withhold 25% of the amounts due the Contractor, in addition to any other required retainage.
  - .3 If a first-tier Subcontractor does not file certified payroll reports as required, the prime Contractor shall withhold 25% of amounts due the first-tier Subcontractor.
  - .4 Each certified statement required by subsection (1) of this section shall be delivered or mailed by the contractor or subcontractor to the public contracting agency. Certified statements shall be submitted to the public contracting agency once a month by the fifth business day of the following month, for each week workers are employed. Information submitted on certified statements may be used only to ensure compliance with the provisions of ORS 279C.800 to 279C.870.
  - .5 Each contractor or subcontractor shall preserve the certified statements for a period of three years from the date of completion of the contract.
  - .6 Certified statements received by a public agency are public records subject to the provisions of ORS 192.410 to 192.505. As such, they must be made available upon request.

3.4.8 PAYMENT OF CLAIMS BY PUBLIC OFFICERS: If the Contractor fails, neglects or refuses to make prompt payment of any claims for labor or services furnished to the Contractor or a subcontractor by any person in connection with this Contract as such claim becomes due, the Owner may pay such claim and charge the amount of the payment against funds due or to become due the Contractor by reason of this Contract.

3.4.9 PAYMENT FOR MEDICAL CARE AND PROVIDING WORKERS' COMPENSATION: The Contractor shall promptly, as due, make payment to any person, co-partnership, association or corporation, furnishing medical, surgical and hospital care or other needed care and attention, incident to sickness or injury, to the employees of such Contractor, of all sums which the Contractor agrees to pay for such services and all moneys and sums which the Contractor collected or deducted from the wages of employees pursuant to any law, contract or agreement for the purpose of providing or paying for such service.

3.4.10 Any person owed for labor or material by a subcontractor or Contractor may file a complaint with the Construction Contractors Board in accordance with ORS 279C.515(3).

E. 3.7 PERMITS, FEES AND NOTICES

- 1. Delete Subparagraph 3.7.1, and substitute the following:

3.7.1 The OWNER will pay the plan check fee, building permit fee, and systems development charges directly to the authority having jurisdiction. The Owner will pay the initial review and approval costs for deferred submittals, which are specifically required by the governing jurisdiction during the plan review process, directly to the authority having jurisdiction. Any deferred submittal costs due to incomplete submittals, or corrections required by the governing jurisdiction shall be the responsibility of the contractor.

The CONTRACTOR shall pay for all other permits, fees, licenses and inspections necessary for the proper execution and completion of the Work which are customarily secured after execution of the Contract and which are legally required when bids are received or negotiations concluded. The Contractor shall pick up permits and call for inspections through final inspection, as required by the City Building Department.

F. 3.12 SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

1. Add the following to Subparagraph 3.12.5:

Submittals which are not marked as reviewed for compliance with the Contract Documents and approved by the Contractor may be returned by the Architect without action.

2. Add the following to Subparagraph 3.12.9:

Shop drawings that are submitted to the Architect for review do not constitute "in writing" unless it is brought to the attention of the Architect, in written form, that specific changes are being suggested. In any event, changes to the contract documents by means of shop drawings become the responsibility of the person initiating such changes.

G. 3.18 INDEMNIFICATION

1. Delete Subparagraph 3.18.1, and substitute the following:

13.18.1 To the fullest extent of the law, the Contractor will defend, indemnify, hold harmless and reimburse the Eugene School District 4J (including its officers, board members, agents, and employees) from all claims, demands, suits, actions, penalties, and damage expenses, for liability of any kind including attorney's fees. To the extent that death or bodily injury to persons or damage to property arises out of the fault of the Contractor, the Contractor's indemnity obligation exists only to the extent that the death or bodily injury to persons or damage to property arises out of the fault of the Contractor, or the fault of the Contractor's agents, representatives or subcontractors, contributed to or caused such damage, whether or not such incidents are contributed to or caused in any part by Eugene School District 4J.

1.4 ARTICLE 4 ARCHITECT

A. 4.1 GENERAL

1. Modify Paragraph 4.1.1

- a. In the first sentence delete "shall retain" and insert "may have retained" in its place.
- b. Add sentence: "The term "Architect" means the Architect or the Architect's authorized representative."

2. Add the following to Subparagraph 4.1.2:

Written consent of the Contractor shall only apply to those items which directly or indirectly affect the work of the Contractor.

3. Add the following Subparagraph:

In the first sentence delete "shall" and insert "may" in its place.

4. Add the following Subparagraph:

- 4.1.4 The Architect is defined as:

Robertson Sherwood Architects pc, 132 East Broadway – Suite 540, Eugene, Oregon.

B. 4.2 ADMINISTRATION OF THE CONTRACT

1. Add the following sentence to 4.2.1:

The architect may be retained to administer the Contract through the specified period for correction of the Work described in Section 12.2

2. Add the following to Subparagraph 4.2.4:

4.2.4.1 The Owner may communicate directly with the Contractor when necessary or appropriate. The Owner may give direction to the Contractor in matters related to access to the site, coordination with Owner's occupancy and use by the public, use of parking and staging areas, use of potentially hazardous products, drug and alcohol policy, no smoking policy, appropriate dress and behavior, safety requirements and safe work practices, where appropriate. The Owner will advise the Architect regarding any communication with or direction given to the Contractor.

4.2.4.2 Representatives of the Owner, Contractor and Architect shall meet periodically at mutually agreed-upon intervals for the purpose of establishing procedures to facilitate cooperation, communication and timely responses among the participants. By participating in this arrangement, the parties do not intend to create additional contractual obligations or modify the legal relationships which may otherwise exist. Nothing in this agreement shall give the Architect the authority to make decisions or give direction without the Owner's concurrence.

3. Add the following to Subparagraph 4.2.9:

4.2.9.1 The Architect will make one inspection for the determination of Substantial Completion and one for determination of Final Acceptance. Such inspections will be made only after receipt of written notification of readiness for such inspections from Contractor.

4.2.9.2 Should additional inspections beyond those listed in 4.2.9.1 be required due to Contractor's failure to satisfactorily complete all work, the Contractor shall become responsible for all costs incurred by the Owner in conjunction with required re-inspections. A deductive Change Order shall be prepared using the following hourly rates as the basis for calculating the amounts to be deducted:

Architect/Engineer:	\$110 per hour
District 4J Personnel:	\$ 75 per hour

4.2.9.3 The amount to be deducted from the Contract shall be calculated by multiplying the hours expended in additional inspections and documentation by the hourly rates listed in 4.2.9.2.

4. Add the following sentence to Subparagraph 4.2.11:

The architect's response will be within 10 days of receipt of written requests from the Owner or Contractor.

5. Delete Subparagraph 4.2.13, and substitute the following:

4.2.13 Decisions on matters related to aesthetic effect will be made collaboratively between the Owner and the Architect. The final decision shall be the Owner's, if consistent with the intent expressed in the Contract Documents.

6. Add the following sentence to Subparagraph 4.2.14

The architect's response will be within 10 days of receipt of written requests from the Owner or Contractor.

## 1.5 ARTICLE 5 SUBCONTRACTORS

### A. 5.3 SUBCONTRACTUAL RELATIONS

1. Add the following Subparagraphs:

5.3.1 The Contractor shall include in each subcontract for property or services entered into by the Contractor and a subcontractor, including a material supplier, for the purpose of performing a construction contract:

.1 A payment clause that obligates the Contractor to pay the subcontractor for satisfactory performance under its subcontract within 10 days out of such amounts as are paid to the Contractor by the owner under such contract; and

.2 An interest penalty clause that obligates the Contractor to pay to the subcontractor an interest penalty on amounts due in the case of each payment not made in accordance with the payment clause included in the subcontract pursuant to paragraph .1 of this section for the period beginning on the day after the required payment date and ending on the date on which payment of the amount due is made; computed at the rate specified in ORS 279C.580.

5.3.2 The Contractor shall include in each of its subcontracts, for the purpose of performance of such contract condition, a provision requiring the subcontractor to include a payment clause and an interest penalty clause conforming to the requirements of Subparagraph 5.3.1 in each of its subcontracts and to require each of its subcontractors to include such clauses in their subcontracts with each lower-tier subcontractor or supplier.

1.6 ARTICLE 6 CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS

No modifications.

1.7 ARTICLE 7 CHANGES IN THE WORK

A. 7.1 GENERAL

1. Paragraph 7.1.2, delete the following: “an order for minor changes in the Work can be issued by the Architect alone”.

2. Add the following Subparagraph 7.1.4 to Paragraph 7.1:

7.1.4 The combined overhead and profit included in the total cost or credit to the Owner of a change in the Work shall not exceed that stated in 7.1.4.4 below. In no case shall the Contractor’s or Subcontractors individual overhead and profit request exceed the following schedule:

.1 For the Contractor, for Work performed by the Contractor’s own forces, 15 percent of the cost.

.2 For the Contractor, for Work performed by the Contractor’s Subcontractors, 10 percent of the amount due the Subcontractors.

.3 For each Subcontractor involved, for Work performed by that Subcontractor’s own forces, 10 percent of the cost.

.4 The **Base Cost** to which overhead and profit is to be applied shall be determined in accordance with Subparagraph 7.3.7., articles .1, .2, .3, .4, and .5. To this **Base Cost** is added the applicable overhead and profit. In no case shall the combined overhead and profit (including all Contractor and Subcontractor(s) overhead and profit) exceed 25 percent of this **Base Cost**.

.5 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 itemization of costs including those applicable costs from paragraph 7.3.7, .1 - .5, and Subcontractor and Contractor overhead and profit as applicable.

.6 Cost of preparing change order shall not be included in cost of Change Order.

3. Add the following Subparagraph 7.1.5 to Paragraph 7.1:

7.1.5 A Change Order providing a net CREDIT to the Owner shall include a credit for overhead and profit based on the following schedule:

.1 For the Contractor, 5 percent of the Cost to be credited.

.2 For each Subcontractor, 5 percent of the Cost to be credited.

.3 For each Sub-subcontractor, 5 percent of the Cost to be credited.

.4 All other provisions of Subparagraph 7.1.4 shall apply to Credit Change Orders.

B. 7.3 CONSTRUCTION CHANGE DIRECTIVES

1. Add the following to Subparagraph 7.3.1:

For the purposes of this Agreement, The Owner’s “CHANGE REQUEST/PROCEED ORDER” may be substituted for and used interchangeably with “CONSTRUCTION CHANGE DIRECTIVE”.

2. Modify Subparagraph 7.3.7 as follows:

In the first sentence, delete the words "a reasonable amount." and substitute "an amount for overhead and profit in accordance with Paragraph 7.1.4 or 7.1.5."



3. Delete Subparagraph 7.3.7.1 and substitute the following:

7.3.7.1 The maximum allowable hourly wage rate for Changes to the Work shall be the appropriate Base Wage Rate plus Fringe Rate as listed for each occupation in the Prevailing Wage Rate for Public Works Contracts in Oregon manual issued by the Oregon Bureau of Industries; multiplied by 1.25. An amount for Overhead and Profit may be added in accordance with Paragraph 7.1.4 or 7.1.5.

4. Delete 7.3.7.3, and substitute the following:

7.3.7.3 Rental costs of machinery and equipment, exclusive of hand tools and motor vehicles, when rented from the Contractor or others;

5. Change the first sentence of Subparagraph 7.3.8 to read as follows:

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, including overhead and profit according to the schedule in Subparagraph 7.1.5 above.

6. Change the first sentence of Subparagraph 7.3.9 to read as follows:

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 the Application for Payment accompanied by an executed Change Order indicating the parties' agreement with part or all of such costs.

1.8 ARTICLE 8 TIME

A. 8.2 PROGRESS AND COMPLETION

1. Add the following Subparagraph 8.2.4

8.2.4 The Contractor agrees that said work shall be executed regularly, diligently, at such a rate of progress as will insure Substantial Completion thereof within the time specified. It is expressly understood and agreed by and between the Contractor and the Owner that the time for the completion of the work described herein is reasonable taking into consideration the average climatic range and usual industrial conditions prevailing in this locality.

1.9 ARTICLE 9 PAYMENT AND COMPLETION

A. 9.2 SCHEDULE OF VALUES

1. Revise the first sentence of Subparagraph 9.2 to read as follows:

“... the Contractor shall submit to the Architect and the Owner,.....”

2. Add the following sentence to Paragraph 9.2:

Submit on AIA Document A703, latest edition.

B. 9.3 APPLICATIONS FOR PAYMENT

1. Add the following sentence to Subparagraph 9.3.1:

The form of Application for Payment shall be a notarized AIA Document G702, Application and Certification for Payment, supported by AIA Document G703, Continuation Sheet.

2. Delete Clause 9.3.1.1, and substitute the following:

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, accompanied by an executed Change Order.

C. 9.5 DECISIONS TO WITHHOLD CERTIFICATION

1. Delete Subparagraph 9.5.3.

D. 9.6 PROGRESS PAYMENTS

1. Add the following Clause to Subparagraph 9.6.1:

9.6.1.1 After the Architect has issued a certificate for payment and it has been approved by the Owner, the Owner will pay the Contractor 95 percent (95%) of the total value of material and labor incorporated into the project as indicated on the Application for Payment less the aggregate of previous payments. Progress schedule update shall accompany each payment request.

9.6.1.2 Payment will be made within fifteen (15) days of approval of the Application for Payment by School District 4J (“Progress Payment Due Date”).

9.6.1.3 The first Application for Payment and each subsequent Application for Payment will not be considered complete unless it is accompanied by the certified payroll for the contractor and all subcontractors requesting payment.

2. Add the following Subparagraph to Paragraph 9.6:

9.6.8 In lieu of cash retainage to be held by the Owner, the Contractor may select one of the following options:

- .1 The Contractor may deposit bonds or securities with the Owner or in any bank or trust company to be held for the benefit of the Owner. In such event, the Owner shall reduce the retainage in an equal amount to the value of the bonds and securities.
- .2 Upon written request of the Contractor, the Owner will deposit any amounts withheld as retainage in an interest-bearing account in a bank, savings bank, trust company or savings association for the benefit of the Owner. Interest earned shall accrue to the Contractor.
- .3 If the Owner incurs additional costs as a result of the exercise of any of the options for retainage described herein, the Owner may recover such costs from the Contractor by reduction of final payment.

E. 9.8 SUBSTANTIAL COMPLETION

1. Delete Subparagraph 9.8.1 and substitute the following:

9.8.1 Substantial Completion is the stage in the progress of the Work when the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so the Owner can fully occupy and fully utilize the Work for its intended use with only minor corrective work remaining which can be accomplished without disruption of the occupants.

2. Delete the last two sentences to Subparagraph 9.8.5 and add the following:

9.8.5 Upon Substantial Completion of the Work, the Contractor may submit an application for payment in accordance with Subparagraph 9.3.1 in an amount sufficient to increase the total payments to ninety-five percent (95%) of the Contract Sum, less such amounts as the Architect determines for incomplete Work or unsettled claims.

F. 9.10 FINAL COMPLETION AND FINAL PAYMENT

1. Add the following Subparagraph to Paragraph 9.10:

9.10.6 The Contractor shall not permit any lien or claim to be filed or prosecuted against the Owner on account of any labor or material furnished in connection with the Work.

G. Add the following Paragraphs to Article 9:

1. 9.11 LIQUIDATED DAMAGES

9.11.1 The Owner will suffer financial loss if the Work is not Substantially Complete, as defined in Article 9.8.1 above, on the dates specified in Section 01 10 00. The Contractor and the Contractor's surety shall be liable for and shall pay the Owner the sum hereinafter stipulated as fixed, agreed, and liquidated damages for each calendar day of delay until the date established in the Certificate of Substantial Completion.

The agreed amount of liquidated damages is \$1,000 per each calendar day for each phase. The amount of liquidated damages may be reduced in cases of partial occupancy, at the sole discretion of the Owner.

2. 9.12 AGENCY PAYMENT FOR UNPAID LABOR OR SUPPLIES

9.12.1 Contract incomplete. If the Contract is still in force, the Agency may, in accordance with ORS 279C.515, pay a valid claim to the Entity furnishing the labor or services, and charge the amount against payments due or to become due to the Contractor under the Contract. If an Agency chooses to make such a payment as provided in 279C.515, the Contractor and the Contractor's surety shall not be relieved from liability for unpaid claims.

9.12.2. Contract completed. If the Contract has been completed and all funds disbursed to the prime Contractor, all claims shall be referred to the Contractor's surety for resolution. The Agency shall not make payments to subcontractors or suppliers for Work already paid for by the Agency.

1.10 ARTICLE 10 PROTECTION OF PERSONS AND PROPERTY

A. 10.1 SAFETY PRECAUTIONS AND PROGRAMS

1. Add the following sentence to Article 10.1

Where asbestos abatement is part of the Work, the Contractor or appropriate subcontractor shall be licensed by the Department of Environmental Quality to perform "asbestos abatement work", OAR 340-248-0120, Adopted January 25, 1990, and meet requirements of AHERA, as specified in Federal Register 40CFR, Part 763.

B. 10.3 HAZARDOUS MATERIALS

1. Delete Subparagraph 10.3.3.

1.11 ARTICLE 11 INSURANCE AND BONDS

A. 11.1 CONTRACTOR'S LIABILITY INSURANCE

1. Modify the second sentence of Subparagraph 11.1.2 as follows:

a. Delete the following: "...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 coverage as specified in the Contract Documents."

2. Add the following Clause to Subparagraph 11.1.2:

.1. The Contractor shall provide and maintain in force for the duration of this agreement, the following:

.1 General Insurance:

The Contractor shall maintain in force for the duration of this agreement a Umbrella Insurance Policy with the limits not less than \$5,000,000, a Commercial General Liability, Automobile Liability (owned, non-owned and hired) Insurance policy(s) written on an occurrence basis with limits not less than \$1,000,000 per occurrence and \$2,000,000 in the aggregated naming the District, its employees, officials and agents as an additional insured as respects to work or services performed under this agreement. This insurance will be primary to any insurance the District may carry on its own. If the District requires Professional Liability coverage, the terms, conditions, and limits must be approved by the District's Risk Manager. (eff. 4/2/13)

.2 Workers' Compensation:

Contractor shall provide and maintain workers' compensation coverage for its employees, officers, agents, or partners, as required by applicable workers' compensation laws.

.3 Evidence of Coverage:

Evidence of the above coverages issued by a company satisfactory to the District shall be provided to the District by way of a certificate of insurance before any work or services commence. A 30-day notice of cancellation or material change in coverage clause shall be included. It is the Contractor's obligation to provide the 30 days notice if not done so by the

Contractor's insurance company(s). Failure to maintain the proper insurance shall be grounds for immediate termination of this Agreement.

4 Subcontractors:

The Contractor shall require all subcontractors to provide and maintain general liability, auto liability, professional liability (as applicable) and Workers' Compensation insurance with coverage's equivalent to those required of the General Contractor in this Agreement. The Contractor shall require certificates of insurance from all subcontractors as evidence of coverage.

.5 Exceptions or Waivers:

Any exception or waiver of these requirements shall be subject to review and written approval from the Eugene School District Risk Manager.

3. Delete the third sentence of Subparagraph 11.1.3

B. 11.3 PROPERTY INSURANCE

1. Modify the first sentence of Subparagraph 11.3.1 as follows:

- a. Delete "Unless otherwise provided, the Owner" and substitute "The Contractor".
- b. Modify the last sentence by adding "Architect," after the word "Owner".

2. Add the following to Clause 11.3.1.1:

The form of policy for this coverage shall be Completed Value. If the Owner is damaged by the failure of the Contractor to maintain such insurance, then the Contractor shall bear all reasonable costs properly attributed thereto.

3. Delete Clause 11.3.1.2.

4. Modify Clause 11.3.1.3 by substituting "Contractor" for "Owner".

5. Delete Clause 11.3.1.4.

6. Modify the first sentence of Subparagraph 11.3.2 to read: "The Owner, at the Owner's option, may purchase..."

7. Delete Subparagraph 11.3.4.

8. Delete Subparagraph 11.3.6, and substitute the following:

11.3.6 Evidence of the above coverages issued by a company satisfactory to the District shall be provided to the District by way of a certificate of insurance before any work or services commence. A 30-day notice of cancellation or material change in coverage clause shall be included. It is the Contractor's obligation to provide the 30 days notice if not done so by the Contractor's insurance company(s). Failure to maintain the proper insurance shall be grounds for immediate termination of this Agreement.

9. Modify 11.3.7 by substituting "Contractor" for "Owner" at the end of the first sentence.

10. Modify the first sentence of Subparagraph 11.3.8 to read as follows:

11.3.8 A loss insured under the Contractor's property insurance shall be adjusted by the Contractor as fiduciary and made payable to the Contractor and Owner, as their interests may appear, subject to requirements of any applicable mortgagee clause.

11. Delete Subparagraph 11.3.9.

12. Modify the first sentence of Subparagraph 11.3.10 by substituting "Contractor" for "Owner" the first two times it occurs. Modify the last sentence by substituting "Contractor" for "Owner" the second time it occurs.

13. Add the following Subparagraph:

11.3.11 EQUIPMENT AND MATERIAL:

The Contractor shall be responsible for any loss, damage, or destruction of Contractor's own property, equipment, and materials used in conjunction with the Work.

C. 11.4 PERFORMANCE BOND AND PAYMENT BOND

1. Delete 11.4.1 and 11.4.2 and substitute the following:

11.4.1 Unless otherwise stated in the solicitation document, prior to execution of the Agreement, the Bidder shall furnish separate bonds that in all respects conform to the requirements of ORS 279C.380 covering the faithful performance of the Contract, and the payment of all obligations arising thereunder, each in an amount equal to one hundred percent (100%) of the Contract sum. The duration of the performance bond shall match the length of the project warranty.

11.4.2 The surety issuing such bonds shall be duly authorized and licensed to issue bonds in the State of Oregon. The bonds shall be executed by an Attorney-in-fact, principal or other authorized representative for the surety company, showing the Oregon agent for service, and bears the seal of the surety company. Where the bond is executed by a person outside the state of Oregon, his authority to execute bond shall be shown.

11.4.3 Bonds are to be obtained through a company that is on the US Government Treasury list for approved sureties and/or approved by the Owner's Risk Manager.

11.4.4 Bonds shall be submitted on AIA Document A312, latest edition.

11.4.5 The cost of furnishing such bonds shall be included in the bid.

11.4.6 The Contractor shall deliver the required bonds to the Owner with the signed Agreement to:

Kirk Gebb, Project Manager  
Facilities Management Office  
Eugene Public School District 4J  
715 West Fourth  
Eugene, Oregon 97402

11.4.7 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 their power of attorney.

D. Add the following Paragraphs to Article 11:

1. 11.5 PUBLIC WORKS BOND:

11.5.1 Pursuant to ORS 279C.836, for any contract awarded where the contract price is \$100,000 or greater, the Contractor and every subcontractor shall have a Public Works bond, in the amount of \$30,000 filed with the Construction Contractors Board (CCB) before starting work on the project unless exempt. This bond is in addition to performance bond and payment bond requirements. **A copy of the Contractor's State of Oregon Statutory Public Works Bond shall be provided with the executed contract documents.**

11.5.2 Contractor shall include in every subcontract a provision requiring their Subcontractors to have a public works bond filed with the CCB before starting work on the project, unless exempt. Contractors shall verify that all of their subcontractors have filed a public works bond with the CCB.

1.12 ARTICLE 12 UNCOVERING AND CORRECTION OF WORK

A. 12.2 AFTER SUBSTANTIAL COMPLETION

1. Change the following to Clause 12.2.2.1:

In the first sentence change the wording from: "In addition to the Contractor's obligations under Section 3.5, if, within one year....." to: "In accordance with Oregon Revised Statutes 701.304, in addition to the Contractor's obligations under Section 3.5, if, within two years....."

2. Add the following sentence to Clause 12.2.2.1:

The correction period relating to faulty products and workmanship will begin on the date appearing on the Certificate of Substantial Completion, or if a Certificate of Substantial Completion is not issued, on the date appearing on the Final Certificate of Payment to the Contractor, whichever is earlier. The Owner's use of the project will not alter the warranty period herein defined.

3. Change the following to Clause 12.2.2.2:

In the first sentence change the wording from: "The one year period..." to: The two year period..."

4. Add the following sentence to Clause 12.2.2.2:

The correction periods specified are an extension of the two-year correction period called for in the General Conditions and are in addition to any guaranty bond called for elsewhere.

5. Change the following to Subparagraph 12.2.2.3:

In the first sentence change the wording from: "The one year period..." to: The two year period..."

6. Change the following to Subparagraph 12.2.5

In the second sentence change the wording from: "Establishment of the one year period..." to: "Establishment of the two year period..."

## 1.13 ARTICLE 13 MISCELLANEOUS PROVISIONS

### A. 13.1 GOVERNING LAW

1. Change Paragraph 13.1 to read as follows:

13.1 The Contract shall be governed by the law of the place where the Project is located.

### B. Add the following Subparagraph 13.1.1:

13.1.1 Contractor shall be in compliance with the Oregon Department of Revenue tax certification rules including OAR 150-305.385 (6)-A, (6)-B, (6)-C and (7).

### C. Revise Subparagraph 13.2.1 as follows:

Delete last two sentences, and replace with:

Contractor shall not assign, sell, dispose of, or transfer rights, nor delegate duties under the contract, either in whole or in part, without the Contracting Agency's prior written consent. Unless otherwise agreed by the Contracting Agency in writing, such consent shall not relieve the Contractor of any obligations under the contract. Any assignee or transferee shall be considered the agent of the Contractor and be bound to abide by all provisions of the contract. If the Contracting Agency consents in writing to an assignment, sale, disposal or transfer of the Contractor's rights or delegation of Contractor's duties, the Contractor and its surety, if any, shall remain liable to the Contracting Agency for complete performance of the contract as if no such assignment, sale, disposal, transfer or delegation had occurred unless the Contracting Agency otherwise agrees in writing, in accordance with ORS 279A.065.

### D. Delete Subparagraph 13.2.2

### E. Add the following Paragraphs to Article 13:

#### 1. 13.8 ENVIRONMENTAL AND NATURAL RESOURCES LAWS AND RULES

13.8.1 The Contractor and subcontractors shall comply with federal, state, and local ordinances and regulations dealing with prevention of pollution and preservation of natural resources that affect Work of this project.

13.8.2 Pursuant to ORS 279C.525, If the Contractor is delayed or must undertake additional work by reason of existing regulation or ordinances of agencies not cited in the Contract Documents or due to the enactment of new or the amendment of existing statutes, ordinances, or regulations relating to the prevention of environmental pollution and the preservation of natural resources occurring after the Bid

Date, the Owner will grant a time extension and issue a change order setting forth the additional work that must be undertaken. The change order shall not invalidate the contract and there shall be, in addition to a reasonable extension of the Contract time, a reasonable adjustment in the Contract price to compensate the successful bidder for all costs and expenses incurred, including overhead and profits, as a result of such delay or additional work.

2. 13.9 FOREIGN CONTRACTORS

In the event this Contract is awarded to a Contractor not domiciled in or registered to do business in the State of Oregon and the contract price exceeds \$10,000, the Contractor shall promptly report to the Department of Revenue the total price, terms of payment, length of contract, and such other information as the Department of Revenue may require before final payment can be received on the public contract. The Owner will satisfy itself that the requirement of this subsection has been complied with before it issues a Final Payment.

3. 13.10 EQUAL OPPORTUNITY

13.10.1 The Contractor shall maintain policies of employment as follows:

13.10.1.1 The Contractor and the Contractor's subcontractors shall not discriminate against any employee or applicant for employment because of race, religion, color, sex or national origin. The Contractor shall take affirmative action to insure that applicants are employed, and that employees are treated during employment without regard to their race, religion, color, sex, national origin, physical or mental handicap, sexual orientation or age, unless based upon bona fide occupational qualifications; and that they are otherwise in compliance with all federal, state and local laws prohibiting discrimination. Such action shall include, but not be limited to, the following: employment, upgrading, demotion or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. It is further understood that any vendor who is in violation of this clause shall be barred forthwith from receiving awards of any purchase order from the School District, unless a satisfactory showing is made that discriminatory practices have terminated and that a recurrence of such acts is unlikely. The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices setting forth the policies of nondiscrimination.

13.10.1.2 The Contractor and the Contractor's subcontractors shall, in all solicitations or advertisements for employees placed by them or on their behalf, state that all qualified applicants will receive consideration for employment without regard to race, religion, color, sex or national origin.

4. 13.11 DRUG-TESTING PROGRAM

13.11.1 The contractor agrees with the provisions of Oregon Revised Statutes 279C.505, which requires that the contractor shall demonstrate it has established a drug-testing program for employees and will require each subcontractor providing labor for the Project to do the same.

1.14 ARTICLE 14 TERMINATION OR SUSPENSION OF THE CONTRACT

No modifications.

1.15 ARTICLE 15 CLAIMS AND DISPUTES

A. 15 CLAIMS AND DISPUTES

1. Add the following to Clause 15.1.5.2

Abnormal weather conditions for the purposes of this agreement are defined as conditions more extreme than any conditions experienced within the general vicinity of the site for each project for a comparable period at any time within the past ten years.

2. Delete Subparagraph 15.1.6.

B. 15.2 INITIAL DECISION

1. Modify Subparagraph 15.2.1 as follows:

In the third sentence, change "30 days" to read "10 days" and add the following: The Initial Decision

Maker shall review all submitted claims and render decisions as soon as possible.

2. Modify Clause 15.2.6.1 as follows:

In the first sentence, change the “30 days and “60 days” to read “10 days” and “30 days” respectively.

C. 15.3 MEDIATION

1. Delete Paragraph 15.3 MEDIATION, and substitute the following:

15.3 MEDIATION AND ARBITRATION

15.3.1 Parties shall attempt to resolve all disputes at the lowest possible level. Both parties to this Agreement agree to provide other resources and personnel to negotiate and find resolution to disputes that cannot be resolved at the Project Manager level. As a next step, claims, disputes or other matters in question between the parties to this Agreement arising out of or relating to this Agreement or breach thereof shall be determined by mediation, arbitration or litigation. Disputes shall be initially submitted to mediation by a mediator chosen by the parties. The cost of mediation shall be borne equally by the parties. If the parties are unable to agree upon a mediator within five days or if mediation fails to resolve the dispute, either party may request that the dispute be submitted to arbitration before a single arbitrator agreed to by the parties in an additional five days. If both parties agree to arbitration but are unable to agree upon an arbitrator, each party shall select an arbitrator, the arbitrators so chosen shall select a third, and the decision of a majority of the arbitrators shall be final, binding the parties, and any judgment may be entered thereon. Unless the parties mutually agree otherwise, any arbitration proceeding shall be conducted in accordance with the currently in effect Construction Industry Arbitration Rules of the American Arbitration Association.

Notwithstanding the above, the Owner may, at the Owner’s sole discretion, elect to resolve disputes in excess of \$50,000 by litigation, if mediation is not successful.

15.3.2 In the event of arbitration or litigation arising out of the execution of this Agreement, the prevailing party shall be entitled to recover from the adverse party, reasonable attorney fees and costs for the arbitration proceedings, trial court or any appellate proceeding, in the amount determined by the arbitrator or the court, as appropriate.

For the purposes of the above provisions referring to attorney fees and related costs, the prevailing party in an arbitration proceeding or trial shall be a claimant who receives an award or damages in excess of the adverse party’s pretrial or prehearing offer made at least 10 days before trial or hearing. If the claimant receives an award of damages no greater than the adverse party’s pretrial or prehearing offer, the adverse party shall be deemed to be the prevailing party. In the event both sides are awarded damages, the prevailing party shall be the party who recovers the net award, provided the recovery exceeds the adverse party’s pretrial or prehearing offer. If the claimant net recovery is no greater than the adverse party’s pretrial or prehearing offer, the adverse party shall be deemed the prevailing party.

D. 15.4 ARBITRATION

1. Delete Paragraph 15.4 ARBITRATION.

**END OF DOCUMENT 00 73 00**



**PREVAILING WAGE RATES**

**PART 1 GENERAL**

**1.1 PREVAILING WAGE RATES**

The Prevailing Wage Rates dated January 1, 2015, including any subsequent corrections or amendments issued by the Oregon Bureau of Labor and Industries, are included as a portion of the Contract Documents by reference. Copies are available for review at the office of Facilities Management, School District 4J, and can be viewed on line at [www.boli.state.or.us](http://www.boli.state.or.us) Click on Prevailing Wages, then PWR Rate Publications, and then Prevailing Wage Rates for Public Works Contracts in Oregon (subject only to state law).

**PART 2 PRODUCTS**

Not Used.

**PART 3 EXECUTION**

Not Used.

**END OF SECTION**

## SUMMARY

### PART 1 GENERAL

#### 1.01 PROJECT

- A. Project Name: Roosevelt Middle School Replacement Project.
- B. Owner's Name: Eugene School District 4J.
- C. Owner's Project Manager: Kirk Gebb.
- D. Architect's Name: Mahlum Architects, Inc and Robertson/Sherwood/Architects pc.
- E. The Project consists of the construction of a new two story middle school, associated demolition and related site development work located at 680 East 24th Avenue, Eugene, Oregon.

#### 1.02 CONTRACT DESCRIPTION

- A. Contract Type: A single prime contract based on fixed price contract as described in the Owner-Contractor Agreement.

#### 1.03 ASSIGNED SUBCONTRACTORS

- A. The Owner has selected for following subcontractors for the project. The subcontractor and final cost of the negotiated work will be assigned to this Contractor by Change Order.
- B. HVAC Controls:
  - Clima-Tech
  - 407 SE International Way, Suite 703
  - Milwaukie, Oregon 97222
  - 503-650-8482

#### 1.04 WORK BY OWNER

- A. Work Under Separate Contract: The Owner will award separate contracts for the following:
  - 1. Asbestos Abatement: Scheduled to be completed between June 16, 2016 and July 4, 2016.
    - a. Contractor: To be selected.
  - 2. Commissioning, Testing and Balancing:
    - a. Contractor: To be selected.
- B. Items noted NIC (Not in Contract) will be supplied and installed by Owner after Substantial Completion. Some items include:
  - 1. Furnishings.
  - 2. Small equipment.
  - 3. Artwork, except for glass art tiles as noted below.
- C. Owner will supply and install the following (OFOI):
  - 1. Trash compactor located in Service Courtyard.
- D. Owner will furnish the following items for installation by Contractor (OFCI):
  - 1. Section 10 28 00 - Toilet, Bath, and Laundry Accessories:
    - a. Toilet Paper Dispensers.
    - b. Paper Towel Dispensers.
    - c. Soap Dispensers.
    - d. Toilet Seat Cover Dispensers.
    - e. Sanitary napkin disposal.
  - 2. Section 09 30 00 - Tiling: Glass art tiles for installation at Main Entry wall, toilet rooms and locker rooms as indicated on Drawings.
  - 3. Section 10 44 00 - Fire Protection Specialties
    - a. Fire Extinguishers.
  - 4. General requirements concerning Owner furnished items:
    - a. Owner will arrange for and deliver Shop Drawings, Product Data, and Samples to Contractor.

- b. Owner will arrange and pay for delivery of Owner-furnished items according to a mutually coordinated Construction Schedule.
- c. After delivery, Owner will inspect delivered items for damage. Contractor shall be present for and assist in Owner's inspection.
- d. If Owner-furnished items are damaged, defective, or missing, Owner will arrange for replacement.
- e. Contractor shall review Shop Drawings, Product Data, and Samples and return them to Architect noting discrepancies or anticipated problems in use of product.
- f. Contractor is responsible for receiving, unloading, and handling Owner-furnished items at Project site.
- g. Contractor is responsible for protecting Owner-furnished items from damage during storage and handling, including damage from exposure to the elements.
- h. If Owner-furnished items are damaged as a result of Contractor's operations, Contractor shall repair or replace them.

#### **1.05 OWNER OCCUPANCY**

- A. Owner intends to continue to occupy the existing building and associated parking lots and drives through Substantial Completion of Phase 1 and through the 2015-2016 school year until completion of Owner-salvaged items which will precede the asbestos abatement.
- B. Owner intends to occupy the new building upon Substantial Completion of Phase 1 Work.
- C. Cooperate with Owner to minimize conflict and to facilitate Owner's operations.
- D. Schedule the Work to accommodate Owner occupancy.

#### **1.06 CONTRACTOR USE OF SITE AND PREMISES**

- A. Construction Operations: Limited to areas noted on Drawings.
- B. Arrange use of site and premises to allow:
  - 1. Owner occupancy.
  - 2. Work by Others.
  - 3. Work by Owner.
  - 4. Use of site and premises by the public.
- C. Provide access to and from site as required by law and by Owner:
  - 1. Do not obstruct roadways, sidewalks, or other public ways without permit.
  - 2. Do not use existing access roads or existing parking areas during Phase 1.
- D. Site Access: Maintain drives and building entrances and exits clear and protected at all times to Owner's, employees, and public access and for use by emergency personnel. Do not use these areas for parking or storage. Schedule deliveries to minimize space and time requirements for storage of materials at site.
- E. Utility Outages and Shutdown:
  - 1. Limit disruption of utility services to hours the building is unoccupied.
  - 2. Do not disrupt or shut down life safety systems, including but not limited to fire sprinklers and fire alarm system, without 7 days notice to Owner and authorities having jurisdiction.
  - 3. Prevent accidental disruption of utility services to other facilities.

#### **1.07 WORK SEQUENCE AND SCHEDULE**

- A. Construct Work in phases during the construction period:
  - 1. Refer to Drawing Sheet L100.1 for clarification of extent of Phase 1 and Phase 2 work.
  - 2. Phase 1: Demolition of existing tennis courts, construction of the new school building and immediately located site development; schedule work to achieve Substantial Completion by May 30, 2016.
  - 3. Phase 2: Demolition of existing school building and related sitework; construction of new site improvements in Phase 2 area; commence work following completion of Owner's asbestos abatement; schedule work to achieve Substantial Completion by August 15, 2016.

4. Final Completion: Schedule work to achieve Final Completion of all Work within 45 days of the date of Substantial Completion.
- B. Coordinate construction schedule and operations with Owner.
- C. Liquidated Damages: Refer to Supplementary General Conditions for contract requirements.

#### **1.08 MISCELLANEOUS PROVISIONS**

- A. Drug and Alcohol Policy:
1. The possession, use, or distribution of illicit drugs and alcohol on school premises is prohibited. Prescription medications brought to the project site shall be in the original container bearing the name of the drug, the name of the physician and the prescribed dosage.
- B. Use of Tobacco Products:
1. Smoking and the other use of tobacco products is prohibited on all school district property pursuant to OAR 581-021-0110.
- C. Safety Requirements:
1. Safety must not be sacrificed for the sake of productivity or expedience. Safety of students, staff, and the public is critical. Take all reasonable precautions to prevent endangerment or injury. Advise and coordinate operations with the school office.
  2. All contractors who perform work on District property, and their employees, are expected to know the District's expectations for safe work and to adhere to those expectations.
  3. Contractors are to adhere to the regulations of Oregon OSHA for all projects within the School District.
- D. General Safe Work Practices:
1. Students, public and school staff shall not be put at risk by the activities of contractors or their employees.
  2. Safe vehicle operation rules are to be followed at all times. These include positioning vehicles to minimize the necessity of backing and providing a "spotter", someone who will make sure that people do not run into the path of a vehicle when driving on a playground or field that is occupied by students.
  3. Tools shall never be left out when an unsecured work area is vacated.
  4. Ladders and scaffolding will be taken down when an unsecured work area is vacated.
  5. Open holes and other tripping hazards shall be fenced or barricaded when an unsecured work area is vacated.
  6. Operations resulting in vapors, emissions or flying objects shall be conducted in such a way as to prevent exposure to any unprotected parties or property.
  7. "Secured Work Area" is defined as an area having a perimeter cyclone fence at least 6 feet in height, with gates which close and lock so that no casual entrance is possible by unauthorized adults or children.
  8. Contractor to follow all OR-OSHA rules for Confined Spaces, where applicable.
- E. Communications Regarding Unsafe Practices:
1. Upon perceiving a problem, the District will immediately communicate the concern to the Contractor or Contractor's representative on the work site.
  2. If agreement on correction of unsafe conditions cannot be reached, the concerns of the District shall prevail and safety concerns shall be addressed in accordance with the District requirements.
- F. Electrical Panels - Lockout/Tagout:
1. Contractor shall implement a Lockout/Tag-out program for his employees who take equipment out of service or place equipment back into service. Contractor shall review the District's Energy Control Program prior to commencing work. Rules applying to this procedure are Oregon Occupational Safety and Health Code OAR 437, Division 2, Subdivision J, General Environmental Controls Lockout/Tag-out (1919.147), or latest edition.
- G. Arc Flash - Electrical Safety:

1. Comply with NFPA 70E (Electrical Safety in the Workplace), current edition. Contractor shall comply with Oregon OSHA 1910.137 (Personal Protective Equipment). Review with the School District Project Manager the 'Eugene School District Electrical Safety Program' before any work commences. Comply with all 'Arc Flash' and 'Electrical Safety' protocols referenced in any and all NFPA, OSHA, OROSHA, NEC, NESC, UL, IBC, IFC and ANSI documents (current editions).
- H. Potentially Hazardous Products (Existing Building):
1. The District attempts to maintain a safe and healthy environment for students and staff. The Contractor is therefore required to follow District guidelines controlling the use of potentially hazardous products and to use these products in a safe manner. Guidelines include the use of materials (adhesives, coatings, carpeting, etc.) which are known to emit little or no airborne pollutants.
  2. MSDS information is required for all potentially hazardous products. The Project Manager and a District Safety Specialist will review these and determine what, if any, mitigation procedures will be required.
  3. Contractor is to maintain and post copies of all MSDS information at the project site and adhere to the required controls.
  4. Contractor is to ensure that work area by students and teachers is restricted. The District will provide signage appropriate for this purpose. The Contractor is to construct and maintain appropriate barriers. This shall include provision of physical separation barriers between "construction" and "occupied" spaces.
  5. Contractor to adopt means of maintaining the construction space in negative air pressure in relation to occupied spaces.
  6. Where there is a new or existing ventilation system in an affected space, the system shall be adjusted to provide the maximum amount of outside air possible with the system.
  7. Efforts shall be made to install and operate new ventilation systems as soon in the construction process as practical.
- I. Asbestos Containing Materials Warning:
1. Asbestos containing materials are known to exist in areas of the Work. The Contractor shall not, in any way, disturb materials which are known to contain asbestos, assumed to contain asbestos, or otherwise have not been tested and confirmed to be asbestos free.
  2. Where access to concealed spaces is required, or it is necessary to disturb building materials such as for drilling of holes, cutting, etc., notify the Owner so that proper investigation and/or removal procedures are followed.
  3. Prior to commencing Work, the Contractor shall meet with the District Safety Specialist and review the Owner's Asbestos Management Plan for the locations of asbestos-containing materials and/or materials assumed to contain asbestos. After reviewing the Owner's Asbestos Management Plan, the Contractor is required to sign Form 01 10 00A, Asbestos-containing Materials Notification Statement, provided at the end of this Section.
  4. Contractor must not install any asbestos-containing materials when performing the Work of this project. At the completion of the Work, Contractor will be required to furnish a statement stating that no asbestos-containing materials were installed during the course of the Work. Refer to Sample Form 01 10 00 B at the end of this Section.
- J. Full Time Superintendent Disclosure Statement
1. Prior to or in conjunction with the Preconstruction Conference, the Contractor shall submit the disclosure statement which identifies the Full Time Superintendent for this Project. The form for this statement, Form 01 10 00C, is provided at the end of this Section.

**PART 2 PRODUCTS - NOT USED**

**PART 3 EXECUTION - NOT USED**

**END OF SECTION**

**ASBESTOS-CONTAINING MATERIALS NOTIFICATION STATEMENT  
FOR CONTRACTORS**

This form must be completed and signed by the Contractor prior to beginning work in any Eugene School District 4J building.

The presence of known and assumed asbestos containing materials is documented in the AHERA Management Plan for each building. Copies of the AHERA Management Plan are available in the main office of each building and in the Facilities Management Office at 715 West Fourth Avenue, Eugene, Oregon. The District Asbestos Specialist must be informed of the Contractor's activities in each building prior to the start of work so that the Contractor can be informed on how to use the AHERA Management Plan and to determine if any asbestos-containing materials are likely to be impacted by the work of the Contractor.

The Contractor is responsible for notifying all employees and subcontractors of the presence of asbestos in the building. The Contractor shall not disturb known or assumed asbestos-containing materials. If the Contractor discovers suspected asbestos-containing materials that have not been identified, the Contractor must stop any work impacting the suspected materials and notify the District Asbestos Specialist so that the material can be sampled. Any asbestos-containing materials that must be removed to allow the Contractor to complete the Contractor's work will be removed by the District under separate contract. If the Contractor disturbs asbestos-containing materials, the Contractor will be responsible for the cost of the cleanup and decontamination.

I \_\_\_\_\_, Representing \_\_\_\_\_,  
(Print Name of Representative) (Business Name)

have been notified of the location of the AHERA Management Plan and agree to avoid impacting all known or assumed asbestos-containing materials in the performance of the Work.

\_\_\_\_\_  
Signature of Representative

\_\_\_\_\_  
Date

\_\_\_\_\_  
Work Site

\_\_\_\_\_  
CIP #

**END OF FORM**

**ASBESTOS-CONTAINING MATERIALS STATEMENT**

The Environmental Protection Agency (AHERA) rules require the School District obtain a signed statement from the Site Superintendent that, to the best of his/her knowledge, no asbestos-containing building materials were installed during the Work. Therefore, the following statement must be submitted on the Contractors letterhead prior to Project Closeout.

**SAMPLE FORM**

(To be submitted on the Contractor's letterhead)

**ASBESTOS-CONTAINING MATERIALS STATEMENT**

EUGENE SCHOOL DISTRICT 4J

---

(Name of Project and CIP Number)

We the undersigned, (Name of Company), hereby warrant that to the best of our knowledge all materials furnished for the above referenced project contain 0% asbestos.

---

(Name of Construction Company)

---

(Signature and Date)

---

Printed Name

---

Job Title

**END OF FORM**

**FULL TIME SUPERINTENDENT DISCLOSURE STATEMENT**

Prior to or in conjunction with the Preconstruction Conference, the Contractor shall submit this disclosure statement which identifies the Full Time Superintendent for this Project.

Project Title: Roosevelt Middle School  
Eugene School District 4J  
Eugene, Oregon  
CIP No. 410.566.001

**CONTRACTOR INFORMATION**

Company Name: \_\_\_\_\_

Company Address: \_\_\_\_\_

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

List below the name, address, telephone, cellular phone FAX numbers and e-mail address (if available) for the full time Superintendent for this Project:

Superintendent's Name: \_\_\_\_\_

Address: \_\_\_\_\_  
(if different from Contractor's) \_\_\_\_\_

Phone: \_\_\_\_\_ Fax: \_\_\_\_\_

Cell: \_\_\_\_\_ e-mail \_\_\_\_\_

The undersigned acknowledges that this project requires and will provide a full-time superintendent throughout this project.

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

Printed Name: \_\_\_\_\_

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

Signature Notarized by:

Subscribed and sworn before me this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_.

Notary Public: \_\_\_\_\_  
Signature

My commission expires: \_\_\_\_\_

**END OF STATEMENT**



## PRICE AND PAYMENT PROCEDURES

### PART 1 GENERAL

#### 1.01 SECTION INCLUDES

- A. Procedures for preparation and submittal of applications for progress payments.
- B. Documentation of changes in Contract Sum and Contract Time.
- C. Change procedures.
- D. Correlation of Contractor submittals based on changes.
- E. Procedures for preparation and submittal of application for final payment.

#### 1.02 RELATED REQUIREMENTS

- A. Section 01 20 01 - Change Order/Proceed Order Form.
- B. Section 01 32 16 - Construction Progress Schedule.
- C. Document 00 72 00 - General Conditions : Additional requirements for progress payments, final payment, changes in the Work.
- D. Document 00 73 00 - Supplementary Conditions: Percentage allowances for Contractor's overhead and profit.
- E. Section 01 22 00 - Unit Prices: Monetary values of unit prices, payment and modification procedures relating to unit prices.

#### 1.03 SCHEDULE OF VALUES

- A. Coordinate with Section 01 32 16 - Construction Progress Schedule.
- B. Electronic media printout including equivalent information will be considered in lieu of standard form specified; submit sample to Architect for approval.
- C. Forms filled out by hand will not be accepted.
- D. Submit a printed schedule on AIA Form G703 - Application and Certificate for Payment Continuation Sheet. Contractor's standard form or electronic media printout will be considered.
- E. Submit Schedule of Values in duplicate within 15 days after date of Owner-Contractor Agreement.
- F. Format: Utilize the Table of Contents of this Project Manual. Identify each line item with number and title of the specification Section. Identify site mobilization.
- G. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports.
  - 1. Provide several line items for principal subcontract amounts, where appropriate.
  - 2. Provide separate line items in the Schedule of Values for initial cost of materials, for each subsequent stage of completion, and for total installed value of that part of the Work.
  - 3. Provide a separate line item in the Schedule of Values for each part of the Work where Applications for Payment may include materials or equipment purchased or fabricated and stored, but not yet installed.
  - 4. Round amounts to nearest whole dollar; total shall equal the Contract Sum.
- H. Include within each line item, a direct proportional amount of Contractor's overhead and profit.
- I. Revise schedule to list approved Change Orders, with each Application For Payment.

#### 1.04 APPLICATIONS FOR PROGRESS PAYMENTS

- A. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of first Application for Payment include the following:
  - 1. List of subcontractors.

2. Schedule of Values (draft submitted previously).
  3. Contractor's Construction Schedule (preliminary if not final).
  4. Products list.
  5. Schedule of unit prices.
  6. Submittals Schedule (based Architect's list or required submittals).
  7. List of Contractor's staff assignments.
  8. Initial progress report.
  9. Report of preconstruction conference.
- B. Payment Period: Submit at intervals stipulated in the Agreement.
- C. Electronic media printout including equivalent information will be considered in lieu of standard form specified; submit sample to Architect for approval.
- D. Forms filled out by hand will not be accepted.
- E. Present required information in typewritten form.
- F. Form: AIA G702 Application and Certificate for Payment and AIA G703 - Continuation Sheet including continuation sheets when required.
- G. For each item, provide a column for listing each of the following:
1. Item Number.
  2. Description of work.
  3. Scheduled Values.
  4. Previous Applications.
  5. Work in Place and Stored Materials under this Application.
  6. Authorized Change Orders.
  7. Total Completed and Stored to Date of Application.
  8. Percentage of Completion.
  9. Balance to Finish.
  10. Retainage.
- H. Notarize and execute certification by signature of authorized officer.
- I. Use data from approved Schedule of Values. Provide dollar value in each column for each line item for portion of work performed and for stored Products.
1. Entries must match data on the Schedule of Values and Contractor's Construction Schedule. Use updated schedules if revisions were made.
- J. List each authorized Change Order as a separate line item, listing Change Order number and dollar amount as for an original item of Work.
- K. Submit three copies of each Application for Payment.
- L. Include the following with the application:
1. Transmittal letter as specified for Submittals in Section 01 30 00.
  2. Construction progress schedule, revised and current as specified in Section 01 30 00.
  3. Partial release of liens from major Subcontractors and vendors.
- M. When Architect requires substantiating information, submit data justifying dollar amounts in question. Provide one copy of data with cover letter for each copy of submittal. Show application number and date, and line item by number and description.

**1.05 MODIFICATION PROCEDURES**

- A. Minor Changes in the Work: For minor changes not involving an adjustment to the Contract Price or Contract Time, Architect will issue instructions directly to Contractor with concurrence of the Owner.
- B. Change Request/Proceed Order: Architect or Owner may issue a Change Request/Proceed Order on Form 01 20 01 - Change Request/Proceed Order.

1. Change Request contains a complete description of change in the Work. It also designates method to be followed to determine change in the Contract Sum or the Contract Time.
  2. Proceed Order, when signed by the Owner, instructs Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.
  3. When a Change Request is approved and signed by the Owner, it becomes a Proceed Order authorizing the change requested. Do not proceed with any change without the Owner's signature on the Change Request/Proceed Order.
- C. Owner-Initiated Change Requests: Architect will issue a Change Request, which will include a detailed description of proposed changes in the Work that may require adjustment to the Contract Sum or the Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.
1. Change Requests issued by Architect are for information only. Do not consider them instructions either to stop work in progress or to execute the proposed change.
  2. Within time specified in Change Request after receipt of Change Request, submit a quotation estimating cost adjustments to the Contract Sum and the Contract Time necessary to execute the change
- D. Contractor-Initiated Requests: If latent or unforeseen conditions require modifications to the Contract, Contractor may propose changes by submitting a request for a change to the Architect.
1. Changes requested by the Contractor will be authorized only by signature of the Owner on the prescribed. Do not proceed with any changes without this authorization.
  2. Include a statement outlining reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and the Contract Time.
  3. Include an updated Contractor's Construction Schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
  4. Comply with requirements in Section 01 60 00 - Product Requirements, if the proposed change requires substitution of one product or system for product or system specified.
- E. Computation of Change in Contract Amount: As specified in the Agreement and Conditions of the Contract.
1. For change requested by Architect for work falling under a fixed price contract, the amount will be based on Contractor's price quotation.
  2. For change requested by Contractor, the amount will be based on the Contractor's request for a Change Order as approved by Architect.
  3. For pre-determined unit prices and quantities, the amount will be based on the fixed unit prices.
  4. For change ordered by Architect without a quotation from Contractor, the amount will be determined by Architect based on the Contractor's substantiation of costs as specified for Time and Material work.
- F. Documentation/Substantiation of Costs: Provide full information required for evaluation.
1. On request, provide following data:
    - a. Quantities of products and equipment.
    - b. Costs of labor, supervision, overhead, and profit directly attributable to the change.
    - c. Taxes, insurance, and bonds.
    - d. Overhead and profit.
    - e. Justification for any change in Contract Time.
    - f. Credit for deletions from Contract, similarly documented.
  2. Support each claim for additional costs with additional information:
    - a. Origin and date of claim.
    - b. Dates and times work was performed, and by whom.
    - c. Time records and wage rates paid.
    - d. Invoices and receipts for products, equipment, and subcontracts, similarly documented.
  3. For Time and Material work, submit itemized account and supporting data after completion of change, within time limits indicated in the Conditions of the Contract.

- G. Execution of Change Orders: Architect will issue Change Orders for signatures of parties as provided in the Conditions of the Contract.
- H. After execution of Change Order, promptly revise Schedule of Values and Application for Payment forms to record each authorized Change Order as a separate line item and adjust the Contract Sum.
- I. Promptly revise progress schedules to reflect any change in Contract Time, revise sub-schedules to adjust times for other items of work affected by the change, and resubmit.

**1.06 APPLICATION FOR PAYMENT AT SUBSTANTIAL COMPLETION**

- A. After Architect issues the Certificate of Substantial Completion, submit an Application for Payment showing 100 percent completion for portion of the Work claimed as substantially complete.
  - 1. Include documentation supporting claim that the Work is substantially complete and a statement showing an accounting of changes to the Contract Sum.
  - 2. This application shall reflect Certificates of Partial Substantial Completion issued previously for Owner occupancy of designated portions of the Work.

**1.07 APPLICATION FOR FINAL PAYMENT**

- A. Prepare Application for Final Payment as specified for progress payments, identifying total adjusted Contract Sum, previous payments, and sum remaining due.
- B. Application for Final Payment will not be considered until the following have been accomplished:
  - 1. All closeout procedures specified in Section 01 70 00.
  - 2. Updated final statement, accounting for final changes to the Contract Sum.
  - 3. AIA Document G706, "Contractor's Affidavit of Payment of Debts and Claims."
  - 4. AIA Document G706A, "Contractor's Affidavit of Release of Liens."
  - 5. AIA Document G707, "Consent of Surety to Final Payment."
  - 6. Evidence that claims have been settled.
  - 7. Final, liquidated damages settlement statement.

**PART 2 PRODUCTS - NOT USED**

**PART 3 EXECUTION - NOT USED**

**END OF SECTION**

**CHANGE REQUEST/PROCEED ORDER  
Capital Improvement Program  
Eugene School District 4J**

.....  
**CHANGE REQUEST NOTICE No.** \_\_\_\_\_ **Date:** \_\_\_\_\_

Project No.: \_\_\_\_\_ Contract No.: \_\_\_\_\_ Date: \_\_\_\_\_

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

Contractor: \_\_\_\_\_

**1. REQUEST INFORMATION**

Estimated \$ \_\_\_\_\_ Time \_\_\_\_\_ Days \_\_\_\_\_ Initiated by \_\_\_\_\_

Reason for change: \_\_\_\_\_  
\_\_\_\_\_

**2. DESCRIPTION**

Describe changes: \_\_\_\_\_  
\_\_\_\_\_

Describe affected work: \_\_\_\_\_

List plan and spec sections: \_\_\_\_\_

Describe impacted activities: \_\_\_\_\_

Comment: \_\_\_\_\_

**3. DATES**

Need for change first known \_\_\_\_\_ By whom \_\_\_\_\_

Contractor first notified \_\_\_\_\_ How \_\_\_\_\_

Owner first notified \_\_\_\_\_

Date approved or rejected \_\_\_\_\_ By whom \_\_\_\_\_

**4. RECOMMENDATION (cost and time)** \_\_\_\_\_

.....  
**PROCEED ORDER No.:** \_\_\_\_\_ **Date:** \_\_\_\_\_

**1. PAYMENT/COST**

Actual amount of change \$ \_\_\_\_\_ The contract time will be:

Contractor amount \$ \_\_\_\_\_ ( ) increased ( ) decreased by \_\_\_ days

Subcontractor amount \$ \_\_\_\_\_ ( ) will remain unchanged

Type of payment (LS/T&M) \_\_\_\_\_

**2. MISCELLANEOUS**

Subcontractors involved: \_\_\_\_\_

Major materials: \_\_\_\_\_

The cost is not to exceed \$ \_\_\_\_\_ Date: \_\_\_\_\_

**3 CHANGE REQUEST ACCEPTED BY:**

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

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

4J CIP Project Manager: \_\_\_\_\_ Date: \_\_\_\_\_

4J CIP Program Manager: \_\_\_\_\_ Date: \_\_\_\_\_

4J Facilities Director: \_\_\_\_\_ Date: \_\_\_\_\_

Without the signature of Facilities Director, or the acting Director, this Proceed Order is neither accepted or authorized, except by written authorization of other specific delegation.

**END OF FORM**

## 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 method.
- C. Defect assessment and non-payment for rejected work.

#### **1.02 RELATED REQUIREMENTS**

- A. Section 01 20 00 - Price and Payment Procedures.

#### **1.03 COSTS INCLUDED**

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

#### **1.04 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.

#### **1.05 MEASUREMENT OF QUANTITIES**

- A. Measurement methods delineated in the individual specification sections complement the criteria of this section. In the event of conflict, the requirements of the individual specification section govern.
- B. Assist by providing necessary equipment, workers, and survey personnel as required.
- C. Measurement by Volume: Measured by cubic dimension using mean length, width and height or thickness.
- D. Perform surveys required to determine quantities, including control surveys to establish measurement reference lines. Notify Architect prior to starting work.
- E. Owner reserves the right to reject Contractor's measurement of work-in-place that involves use of established unit prices and to have this work measured, at Owner's expense, by an independent surveyor acceptable to Contractor.

#### **1.06 PAYMENT**

- A. Payment for Work governed by unit prices will be made on the basis of the actual measurements and quantities of Work that is incorporated in or made necessary by the Work and accepted by the Architect, multiplied by the unit price.
- 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.

#### **1.07 DEFECT ASSESSMENT**

- A. Replace Work, or portions of the Work, not conforming to specified requirements.
- B. If, in the opinion of Owner, it is not practical to remove and replace the Work, Owner 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 Owner.
  2. The defective Work will be partially repaired to the instructions of the Owner, and the unit price will be adjusted to a new unit price at the discretion of Owner.
- C. The individual specification sections may modify these options or may identify a specific formula or percentage price reduction.
- D. The authority of Architect to assess the defect and identify payment adjustment is final.

**1.08 SCHEDULE OF UNIT PRICES**

- A. Item 1: Over-Excavation and Fill; Section 31 20 00 - Earth Moving.
1. Excavation in excess of that indicated on Drawings or specified.
  2. Additional fill in areas of additional excavation.
  3. Measurement: Volume based on field measurement.
  4. Unit Price: Cost per cubic yard of excess excavation.
- B. Item 2: Additional Length of Piles; Section 31 62 16.19 - Driven Steel Pipe Piles.
1. Contract unit price per unit length including test piles, multiplied by the Actual Pile Length. Base measurement on total linear measurement of piling from base to cut-off elevation, except for test piles calculated at 5 feet longer.
  2. Unit Price: Cost per linear foot of pile in excess of 20 feet.

**PART 2 PRODUCTS - NOT USED**

**PART 3 EXECUTION - NOT USED**

**END OF SECTION**

## ALTERNATES

### PART 1 GENERAL

#### 1.01 SECTION INCLUDES

- A. Procedures for pricing alternates.
- B. Documentation of changes to Contract Sum and Contract Time.

#### 1.02 RELATED REQUIREMENTS

- A. Document 00 21 13 - Instructions to Bidders: Instructions for preparation of pricing for alternatives.

#### 1.03 DEFINITION

- A. Alternate: An amount proposed by bidders and stated on the Bid Form for certain work defined in the Bidding Requirements that may be added to or deducted from the Base Bid amount if Owner decides to accept a corresponding change either in the amount of construction to be completed, the time to complete, or in the products, materials, equipment, systems, or installation methods described in the Contract Documents.
  - 1. The cost or credit for each alternate is the net addition to or deduction from the Contract Sum to incorporate alternate into the Work. No other adjustments are made to the Contract Sum.

#### 1.04 ACCEPTANCE OF ALTERNATES

- A. Alternates quoted on Bid Forms will be reviewed and accepted or rejected at Owner's option. Accepted alternates will be identified in the Owner-Contractor Agreement.
- B. Owner reserves the right to exercise any or all alternates within 60 days of receipt of bids.
- C. Coordinate related work and modify surrounding work to integrate the Work of each alternate.
- D. Notification: Immediately following award of the Contract, notify each party involved, in writing, of the status of each alternate. Indicate if alternates have been accepted, rejected, or deferred for later consideration. Include a complete description of negotiated modifications to alternates.

#### 1.05 SCHEDULE OF ADDITIVE ALTERNATES

- A. Alternate No. A1 - Standing Seam Metal Roofing:
  - 1. Base Bid Item: Thermoplastic TPO roofing system specified in Section 07 54 00 - Thermoplastic Membrane Roofing including rigid roof insulation and related flashing and trim at roofs over Gymnasium and Classrooms.
  - 2. Alternate Bid Item: Standing seam metal roofing system specified in Section 07 41 13 - Metal Roof Panels, including rigid roof insulation specified in Section 07 21 00 - Thermal Insulation at Gymnasium and Classrooms.
- B. Alternate No. A2 - Sports Field Upgrade:
  - 1. Base Bid Item: Irrigated and seeded natural turf field specified in Section 32 80 00 - Irrigation and Section 32 90 00 - Planting .
  - 2. Alternate Bid Item: Add subgrade drainage systems specified in Section 33 46 13 - Sports Field Subdrainage.
- C. Alternate No. A3 - Covered Bike Parking Structure:
  - 1. Base Bid Item: No covered bike parking roof structures.
  - 2. Alternate Bid Item: Covered bike parking roof structures including foundations, drainage piping and lighting as indicated on Drawings.
- D. Alternate No. A4 - Multi-Modal Sidewalk at 24th Avenue:
  - 1. Base Bid Item: Existing and repaired standard width concrete sidewalk at 24th Avenue as indicated on Drawings.



2. Alternate Bid Item: Remove existing sidewalk and provide new 8 foot wide multi-modal sidewalk at 24th Avenue as indicated on Drawings. Provide landscape plantings as indicated in Special Note on Drawing Sheet L105.1.
- E. Alternate No. A5 - Rainwater Harvesting System:
1. Base Bid Item: Gutters and downspouts, downspout collectors piping, storm water diverters, water quality manhole, cistern, and piping to the water quality manhole and cistern, piping from cistern to Boiler Room 174 and all piping between mechanical room and toilet rooms.
  2. Alternate Bid Item: Add cistern pump and Rain Water System RWS-1 in Boiler Room 174. Includes related piping, electrical connections, housekeeping pads and accessories for a complete rainwater harvesting system.

**PART 2 PRODUCTS - NOT USED**

**PART 3 EXECUTION - NOT USED**

**END OF SECTION**

## ADMINISTRATIVE REQUIREMENTS

### PART 1 GENERAL

#### 1.01 SECTION INCLUDES

- A. Project coordination.
- B. Electronic document submittal service.
- C. Preconstruction meeting.
- D. Site mobilization meeting.
- E. Progress meetings.
- F. Preinstallation conferences.
- G. Coordination drawings.
- H. Submittal schedule.
- I. Submittals for review, information, and project closeout.
- J. Number of copies of submittals.
- K. Submittal procedures.

#### 1.02 RELATED REQUIREMENTS

- A. Document 00 72 00 - General Conditions: Dates for applications for payment.
- B. Section 01 10 00 - Summary: Summary of Work.
- C. Section 01 32 16 - Construction Progress Schedule: Form, content, and administration of schedules.
- D. Section 01 70 00 - Execution and Closeout Requirements: Additional coordination requirements.
- E. Section 01 78 00 - Closeout Submittals: Project record documents.
- F. Section 01 91 13 - General Commissioning Requirements: Additional procedures for submittals relating to commissioning.
  - 1. Where submittals are indicated for review by both Architect and the Commissioning Authority, submit one extra and route to Architect first, for forwarding to the Commissioning Authority.
  - 2. Where submittals are not indicated to be reviewed by Architect, submit directly to the Commissioning Authority; otherwise, the procedures specified in this section apply to commissioning submittals.

#### 1.03 PROJECT COORDINATION

- A. Coordination: Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations included in different Sections that depend on each other for proper installation, connection, and operation.
  - 1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
  - 2. Coordinate installation of different components with other contractors to ensure maximum accessibility for required maintenance, service, and repair.
  - 3. Make adequate provisions to accommodate items scheduled for later installation.
  - 4. Where availability of space is limited, coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair of all components, including mechanical and electrical.

- B. Prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.
  - 1. Prepare similar memoranda for Owner and separate contractors if coordination of their Work is required.
- C. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities and activities of other contractors to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
  - 1. Preparation of Contractor's Construction Schedule.
  - 2. Preparation of the Schedule of Values.
  - 3. Installation and removal of temporary facilities and controls.
  - 4. Delivery and processing of submittals.
  - 5. Progress meetings.
  - 6. Preinstallation conferences.
  - 7. Project closeout activities.
  - 8. Startup and adjustment of systems.
  - 9. Project closeout activities.
- D. Conservation: Coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water, and materials.
  - 1. Salvage materials and equipment involved in performance of, but not actually incorporated into, the Work. Refer to other Sections for disposition of salvaged materials that are designated as Owner's property.

**PART 2 PRODUCTS - NOT USED**

**PART 3 EXECUTION**

**3.01 ELECTRONIC DOCUMENT SUBMITTAL SERVICE**

- A. All documents transmitted for purposes of administration of the contract are to be in electronic (PDF) format and transmitted via an Internet-based submittal service that receives, logs and stores documents, provides electronic stamping and signatures, and notifies addressees via email.
  - 1. Besides submittals for review, information, and closeout, this procedure applies to requests for information (RFIs), progress documentation, contract modification documents (e.g. supplementary instructions, change proposals, change orders), applications for payment, field reports and meeting minutes, and any other document any participant wishes to make part of the project record.
  - 2. Contractor and Architect are required to use this service.
  - 3. It is Contractor's responsibility to submit documents in PDF format.
  - 4. Subcontractors, suppliers, and Architect's consultants are to be permitted to use the service at no extra charge.
  - 5. Users of the service need an email address, Internet access, and PDF review software that includes ability to mark up and apply electronic stamps (such as Adobe Acrobat, [www.adobe.com](http://www.adobe.com), or Bluebeam PDF Revu, [www.bluebeam.com](http://www.bluebeam.com)), unless such software capability is provided by the service provider.
  - 6. Paper document transmittals will not be reviewed; emailed PDF documents will not be reviewed.
  - 7. All other specified submittal and document transmission procedures apply, except that electronic document requirements do not apply to samples or color selection charts.
- B. Cost: The cost of the service is to be paid by Contractor; include the cost of the service in the contract sum.
- C. Training: One, one-hour, web-based training session will be arranged for all participants, with representatives of Architect and Contractor participating; further training is the responsibility of the user of the service.

- D. Project Closeout: Architect will determine when to terminate the service for the project and is responsible for obtaining archive copies of files for Owner.

**3.02 PRECONSTRUCTION MEETING**

- A. Owner will schedule a meeting after Notice to Proceed.
- B. Attendance Required:
  - 1. Owner.
  - 2. Architect.
  - 3. Architect's consultants as appropriate.
  - 4. Contractor.
  - 5. Major Subcontractors.
  - 6. Suppliers as appropriate.
- C. Agenda:
  - 1. Introduction of persons present.
  - 2. Distribution of Contract Documents.
  - 3. Designation of personnel representing the parties to Contract and Architect.
  - 4. Communications.
  - 5. Procedures and processing of field decisions, submittals, substitutions, applications for payments, proposal request, Change Orders, and Contract closeout procedures. Including MSDS information.
  - 6. Phasing and scheduling.
  - 7. Work hours and restrictions.
  - 8. Use of premises by Owner and Contractor.
  - 9. Parking.
  - 10. Owner's requirements and occupancy prior to completion.
  - 11. Construction facilities and controls provided by Owner.
  - 12. Temporary utilities provided by Owner.
  - 13. Temporary facilities provided by Contractor.
  - 14. Security procedures.
  - 15. Progress cleaning.
  - 16. Safety and first aid.
  - 17. Procedures for testing.
  - 18. Procedures for maintaining record documents.
  - 19. Requirements for start-up of equipment.
  - 20. Inspection and acceptance of equipment put into service during construction period.
- D. Record minutes and distribute copies within two days after meeting to participants, with copies to Architect, Owner, participants, and those affected by decisions made.

**3.03 PROGRESS MEETINGS**

- A. Schedule and administer meetings throughout progress of the Work at maximum weekly intervals.
- B. Make arrangements for meetings, prepare agenda with copies for participants, preside at meetings.
- C. Attendance Required: Job superintendent, major Subcontractors and suppliers, Owner, Architect, as appropriate to agenda topics for each meeting.
- D. Agenda:
  - 1. Review minutes of previous meetings.
    - a. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
  - 2. Review of Work progress.
    - a. Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's Construction Schedule. Determine how construction behind schedule will be expedited; secure

commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.

3. Field observations, problems, and decisions.
  4. Identification of problems that impede, or will impede, planned progress.
  5. Review of submittals schedule and status of submittals.
  6. Review outstanding RFIs.
  7. Review of off-site fabrication and delivery schedules.
  8. Planned progress during succeeding work period.
  9. Coordination of projected progress.
  10. Maintenance of quality and work standards.
  11. Effect of proposed changes on progress schedule and coordination.
  12. Documentation of information for payment requests.
  13. Other business relating to Work.
- E. Record minutes and distribute copies within two days after meeting to participants, with copies to Architect, Owner, participants, and those affected by decisions made.

### **3.04 PREINSTALLATION CONFERENCES**

- A. When required by individual specification sections, conduct a preinstallation conference at Project site before each construction activity that requires coordination with other construction.
1. Attendees: Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise Architect and Owner's Project Manager a minimum of four days prior to scheduled meeting dates.
  2. Agenda: Review progress of other construction activities and preparations for the particular activity under consideration, including requirements for the following:
    - a. Contract documents.
    - b. Related requests for interpretations (RFIs).
    - c. Related Change Orders.
    - d. Purchases.
    - e. Deliveries.
    - f. Submittals.
    - g. Possible conflicts.
    - h. Compatibility problems.
    - i. Time schedules.
    - j. Weather limitations.
    - k. Manufacturer's written recommendations.
    - l. Warranty requirements.
    - m. Compatibility of materials.
    - n. Acceptability of substrates.
    - o. Space and access limitations.
    - p. Regulations of authorities having jurisdiction.
    - q. Testing and inspecting requirements.
    - r. Installation procedures.
    - s. Coordination with other work.
    - t. Required performance results.
    - u. Protection of adjacent work.
  3. Contractor to record significant conference discussions, agreements, and disagreements, including required corrective measures and actions.
  4. Distribute minutes of the meeting to each party present and to parties who should have been present, within three working days.
  5. Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.

**3.05 CONSTRUCTION PROGRESS SCHEDULE - See Section 01 32 16**

**3.06 COORDINATION DRAWINGS**

- A. Provide information required by Project Coordinator for preparation of coordination drawings.
- B. Review drawings prior to submission to Architect.

**3.07 SUBMITTAL SCHEDULE**

- A. Submittals Schedule: Submit three copies of schedule. Arrange the following information in a tabular format.
  - 1. Scheduled date for first submittal.
  - 2. Specification Section number and title.
  - 3. Submittal category (action or informational).
  - 4. Name of subcontractor.
  - 5. Description of the Work covered.
- B. Scheduled date for Architect's final release or approval

**3.08 SUBMITTALS FOR REVIEW**

- A. When the following are specified in individual sections, submit them for review:
  - 1. Product data.
  - 2. Shop drawings.
  - 3. Samples for selection.
  - 4. Samples for verification.
- B. Submit to Architect for review for the limited purpose of checking for conformance with information given and the design concept expressed in the contract documents.
- C. Samples will be reviewed only for aesthetic, color, or finish selection.
- D. After review, provide copies and distribute in accordance with SUBMITTAL PROCEDURES article below and for record documents purposes described in Section 01 78 00 - Closeout Submittals.

**3.09 SUBMITTALS FOR INFORMATION**

- A. When the following are specified in individual sections, submit them for information:
  - 1. Design data.
  - 2. Certificates.
  - 3. Test reports.
  - 4. Inspection reports.
  - 5. Manufacturer's instructions.
  - 6. Manufacturer's field reports.
  - 7. Other types indicated.
- B. Submit for Architect's knowledge as contract administrator or for Owner. No action will be taken.

**3.10 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.

**3.11 SUBMITTAL PROCEDURES**

- A. Transmit each submittal with a copy of approved submittal form.

- B. Transmit each submittal with approved form.
- C. Sequentially number the transmittal form. Revise submittals with original number and a sequential alphabetic suffix.
- D. Identify Project, Contractor, Subcontractor or supplier; pertinent drawing and detail number, and specification section number, as appropriate on each copy.
- E. Apply Contractor's stamp, signed or initialed certifying that review, approval, verification of Products required, field dimensions, adjacent construction Work, and coordination of information is in accordance with the requirements of the Work and Contract Documents.
- F. Schedule submittals to expedite the Project, and coordinate submission of related items.
- G. For each submittal for review, allow 15 days excluding delivery time to and from the Contractor.
- H. Identify variations from Contract Documents and Product or system limitations that may be detrimental to successful performance of the completed Work.
- I. Provide space for Contractor and Architect review stamps.
- J. When revised for resubmission, identify all changes made since previous submission.
- K. Distribute reviewed submittals as appropriate. Instruct parties to promptly report any inability to comply with requirements.
- L. Submittals not requested will not be recognized or processed.

**END OF SECTION**

**PRECONSTRUCTION CONFERENCE AGENDA (SAMPLE)**

Eugene School District 4J  
[Enter Project Name]

[Date]

AGENDA

1. ( ) Introduction of Persons Present
  - ( ) District 4J
  - ( ) Consultants
  - ( ) Contractor (including job foreman)
  - ( ) Subcontractors
  
2. ( ) Availability of Contract Documents
  
3. ( ) Building Permit Status
  - ( ) Plan check and Building Permit paid by District
  - ( ) Pick up Permit at City of Eugene by Contractor
  - ( ) Location of site stored approved contract documents
  - ( ) Utility permits
  - ( ) LRAPA Permit
  
4. ( ) Prevailing Wage Requirements
  - ( ) Submittal schedule
  - ( ) Conformance with requirements
  
5. ( ) Communications
  - ( ) Notification of problems
  
6. ( ) Role of District's representative
  - ( ) Limits of authority
  - ( ) Visitation schedules
  
7. ( ) Work Description and Schedule
  - ( ) General work description
  - ( ) Proposed start date: \_\_\_\_\_
  - ( ) Proposed completion date: \_\_\_\_\_
  - ( ) Proposed project schedule and phasing
  - ( ) Progress schedule updates
  - ( ) Methods to be employed to maintain schedule
  - ( ) Work requiring Shop Drawings or submittals shall not commence until review is complete.
  
8. ( ) Submittals Required per Contract Documents
  - ( ) MSDS Information
  - ( ) Written proof of Asbestos Worker Certification
  - ( ) Name, Experience and Qualifications of Asbestos Supervisor
  - ( ) Copy of Contractor's Asbestos Abatement License
  - ( ) Other information as required by Section 01 31 00.
  - ( ) Schedule of values
  - ( ) List of subcontractors including name of contact person, telephone number, and address
  
9. ( ) Construction
  - ( ) Working hours
  - ( ) Use of premises/set up locations
  - ( ) Protection of existing facilities



PRECONSTRUCTION CONFERENCE AGENDA (SAMPLE) – 01 30 01

- Traffic and protection
  - Excavation and clean-up
  - Weather restrictions
  - Deviation from details and/or specifications
10.  Correction of Defects
- Daily and/or as observed
11.  Weekly On-Site Progress Meetings
- Establish day and time: Day \_\_\_\_\_ Time \_\_\_\_\_
  - Provide updated project schedules
  - Discuss project progress, problems, etc.
  - Review applications for payment
  - Required attendance
  - Observation report distribution
12.  Change Order Requests and Change Order Procedures
- Written Change Order requests required
  - Supporting back-up will be required for all Change Orders
  - Mark-up limitations on Change Orders
    - Contractor - 15 percent
    - Subcontractors - 10 percent
  - Progressive requests and Change Orders
  - Processing time required
13.  Applications for Payment
- Use AIA documents G702 and G703 latest edition
  - Provide 5 signed and notarized copies
  - Wage certifications to be attached
14.  Safety and Emergency Procedures
15.  Clean-up Daily
- Project completion
16.  Project Closeout
- Inspections for
    - Air Clearance
    - AHERA Close Out Requirements
    - Substantial completion
      - Contractor provided list of items to be completed
      - Inspection with job foreman
    - Final Acceptance
      - Written notice from Contractor that all work is done and ready for inspection
      - Inspection with job foreman
    - Responsibility for cost of additional inspections
  - Submittals for Closeout
    - Final application for payment
    - Final set of wage certifications
    - Release of liens from all Subcontractors and general Contractor
17.  Tour of Project Sites to Examine and Document Existing Conditions
18.  Additional Comments

The undersigned acknowledges that the items listed above were discussed during this preconstruction conference and are fully understood.

PRECONSTRUCTION CONFERENCE AGENDA (SAMPLE) – 01 30 01

Date:

A/E Firm:

Contractor:

Subcontractors:

**END OF AGENDA**

## CONSTRUCTION PROGRESS SCHEDULE

### PART 1 GENERAL

#### 1.01 SECTION INCLUDES

- A. Preliminary schedule.
- B. Construction progress schedule, with network analysis diagrams and reports.

#### 1.02 RELATED SECTIONS

- A. Section 01 10 00 - Summary: Work sequence.
- B. Section 01 30 00 - Administrative Requirements: Submittal schedule and schedule of values.

#### 1.03 REFERENCES

- A. AGC (CPSM) - Construction Planning and Scheduling Manual; Associated General Contractors of America; 2004.
- B. M-H (CPM) - CPM in Construction Management - Project Management with CPM, O'Brien, McGraw-Hill Book Company; 2006.

#### 1.04 SUBMITTALS

- A. Within 10 days after date of Agreement, submit preliminary schedule defining planned operations for the first 60 days of Work, with a general outline for remainder of Work.
- B. If preliminary schedule requires revision after review, submit revised schedule within 10 days.
- C. Within 20 days after review of preliminary schedule, submit draft of proposed complete schedule for review.
  - 1. Include written certification that major contractors have reviewed and accepted proposed schedule.
- D. Within 10 days after joint review, submit complete schedule.
- E. Submit updated schedule with each Application for Payment.
- F. Submit the number of opaque reproductions that Contractor requires, plus three copies that will be retained by Architect.

#### 1.05 QUALITY ASSURANCE

- A. Scheduler: Contractor's personnel or specialist Consultant specializing in CPM scheduling with one years minimum experience in scheduling construction work of a complexity comparable to this Project, and having use of computer facilities capable of delivering a detailed graphic printout within 48 hours of request.
- B. Contractor's Administrative Personnel: Three years minimum experience in using and monitoring CPM schedules on comparable projects.

#### 1.06 SCHEDULE FORMAT

- A. Listings: In chronological order according to the start date for each activity. Identify each activity with the applicable specification section number.
- B. Diagram Sheet Size: Maximum 22 x 17 inches or width required.
- C. Scale and Spacing: To allow for notations and revisions.

#### 1.07 COORDINATION

- A. Coordinate preparation and processing of schedules and reports with performance of construction activities and with scheduling and reporting of separate contractors.

- B. Coordinate Contractor's Construction Schedule with the Schedule of Values, list of subcontracts, Submittals Schedule, progress reports, payment requests, and other required schedules and reports.
  - 1. Secure time commitments for performing critical elements of the Work from parties involved.
- C. Coordinate each construction activity in the network with other activities and schedule them in proper sequence

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

## **PART 3 EXECUTION**

### **3.01 PRELIMINARY SCHEDULE**

- A. Prepare preliminary schedule in the form of a horizontal bar chart.

### **3.02 CONTENT**

- A. Show complete sequence of construction by activity, with dates for beginning and completion of each element of construction. Extend schedule from date established for the Notice to Proceed to date of Final Completion.
- B. Identify each item by specification section number.
- C. Identify work of separate stages and other logically grouped activities.
- D. Provide sub-schedules for each stage of Work identified in Section 01 10 00.
- E. Provide sub-schedules to define critical portions of the entire schedule.
- F. Include conferences and meetings in schedule.
- G. Show accumulated percentage of completion of each item, and total percentage of Work completed, as of the first day of each month.
- H. Provide separate schedule of submittal dates for shop drawings, product data, and samples, owner-furnished products, Products identified under Allowances, and dates reviewed submittals will be required from Architect. Indicate decision dates for selection of finishes.
- I. Indicate delivery dates for owner-furnished products.
- J. Coordinate content with schedule of values specified in Section 01 20 00.
- K. Provide legend for symbols and abbreviations used.

### **3.03 NETWORK ANALYSIS**

- A. Prepare network analysis diagrams and supporting mathematical analyses using the Critical Path Method.
- B. Illustrate order and interdependence of activities and sequence of work; how start of a given activity depends on completion of preceding activities, and how completion of the activity may restrain start of subsequent activities.
- C. Mathematical Analysis: Tabulate each activity of detailed network diagrams, using calendar dates, and identify for each activity:
  - 1. Preceding and following event numbers.
  - 2. Activity description.
  - 3. Estimated duration of activity, in maximum 15 day intervals.
  - 4. Earliest start date.
  - 5. Earliest finish date.
  - 6. Actual start date.
  - 7. Actual finish date.
  - 8. Latest start date.
  - 9. Latest finish date.

10. Total and free float; float time shall accrue to Owner and to Owner's benefit.
11. Monetary value of activity, keyed to Schedule of Values.
12. Percentage of activity completed.
13. Responsibility.

- D. Analysis Program: Capable of compiling monetary value of completed and partially completed activities, accepting revised completion dates, and recomputation of all dates and float.
- E. Required Reports: List activities in sorts or groups:
  1. By preceding work item or event number from lowest to highest.
  2. By amount of float, then in order of early start.

### **3.04 REVIEW AND EVALUATION OF SCHEDULE**

- A. Participate in joint review and evaluation of schedule with Architect at each submittal.
- B. Evaluate project status to determine work behind schedule and work ahead of schedule.
- C. After review, revise as necessary as result of review, and resubmit within 10 days.

### **3.05 UPDATING SCHEDULE**

- A. Update: Monthly, minimum.
- B. Maintain schedules to record actual start and finish dates of completed activities.
- C. Indicate progress of each activity to date of revision, with projected completion date of each activity.
- D. Annotate diagrams to graphically depict current status of Work.
- E. Identify activities modified since previous submittal, major changes in Work, and other identifiable changes.
- F. Indicate changes required to maintain Date of Substantial Completion.
- G. Submit reports required to support recommended changes.
- H. Provide narrative report to define problem areas, anticipated delays, and impact on the schedule. Report corrective action taken or proposed and its effect including the effects of changes on schedules of separate contractors.

### **3.06 DISTRIBUTION OF SCHEDULE AND POSTING**

- A. Distribute copies of updated schedules to Contractor's project site file, to Subcontractors, suppliers, Architect, Owner, and other concerned parties.
- B. Instruct recipients to promptly report, in writing, problems anticipated by projections shown in schedules.
- C. Post copies in Project meeting rooms and temporary field offices.

**END OF SECTION**

**SECURITY PROCEDURES**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Security measures including formal security program, entry control, and miscellaneous restrictions.

**1.02 RELATED REQUIREMENTS**

- A. Section 01 10 00 - Summary: use of premises and occupancy.
- B. Section 01 50 00 - Temporary Facilities and Controls: Temporary lighting.

**1.03 SECURITY PROGRAM**

- A. Protect Work, existing premises and Owner's operations from theft, vandalism, and unauthorized entry.
- B. Initiate program at project mobilization.
- C. Maintain program throughout construction period until Owner occupancy.

**1.04 ENTRY CONTROL**

- A. Restrict entrance of persons and vehicles into Project site and existing facilities.
- B. Allow entrance only to authorized persons with proper identification.
- C. Maintain log of workers and visitors, make available to Owner on request.

**PART 2 PRODUCTS - NOT USED**

**PART 3 EXECUTION - NOT USED**

**END OF SECTION**

## QUALITY REQUIREMENTS

### PART 1 GENERAL

#### 1.01 SECTION INCLUDES

- A. References and standards.
- B. Quality assurance submittals.
- C. Mock-ups.
- D. Control of installation.
- E. Tolerances.
- F. Testing and inspection services.
- G. Manufacturers' field services.
- H. Repair and protection.

#### 1.02 RELATED REQUIREMENTS

- A. Document 00 31 00 - Available Project Information: Soil investigation data.
- B. Document 00 72 00 - General Conditions: Inspections and approvals required by public authorities.
- C. Section 01 30 00 - Administrative Requirements: Submittal procedures.
- D. Section 01 60 00 - Product Requirements: Requirements for material and product quality.
- E. Section 01 62 11 - Delegated Design: Requirements for delegated design.

#### 1.03 REFERENCE STANDARDS

- A. ASTM C1021 - Standard Practice for Laboratories Engaged in Testing of Building Sealants; 2008 (Reapproved 2014).
- B. ASTM C1077 - Standard Practice for Laboratories Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Laboratory Evaluation; 2014.
- C. ASTM C1093 - Standard Practice for Accreditation of Testing Agencies for Masonry; 2013.
- D. 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.
- E. ASTM E329 - Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection; 2014a.
- F. ASTM E543 - Standard Specification for Agencies Performing Nondestructive Testing; 2013.

#### 1.04 CONFLICTING REQUIREMENTS

- A. General: If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer uncertainties and requirements that are different, but apparently equal, to Architect for a decision before proceeding.
- B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Architect for a decision before proceeding.

**1.05 SUBMITTALS**

- A. Design Data: Submit for Architect's knowledge as contract administrator for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents, or for Owner's information.
- B. Test Reports: After each test/inspection, promptly submit two copies of report to Architect.
  - 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. Weather and temperature conditions.
    - h. Type of test/inspection.
    - i. Date of test/inspection.
    - j. Results of test/inspection.
    - k. Interpretations of test results where applicable.
    - l. Conformance with Contract Documents.
    - m. When requested by Architect, provide interpretation of results.
    - n. Recommendations for retesting and reinspecting.
- 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 for Architect's benefit as contract administrator or for Owner.
  - 1. Submit report in duplicate within 30 days of observation to Architect for information.
  - 2. Submit for information for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents.
- F. Erection Drawings: Submit drawings for Architect's benefit as contract administrator or for Owner.
  - 1. Submit for information for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents.
  - 2. Data indicating inappropriate or unacceptable Work may be subject to action by Architect or Owner.
- G. Submit required submittals for review to Robertson/Sherwood/Architects pc, 132 East Broadway - Suite 540, Eugene, Oregon 97401, attention: Dave Guadagni, AIA.

**1.06 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 specified in the individual specification sections, except where a specific date is established by applicable code.
- C. Obtain copies of standards where required by product specification sections.



- D. Maintain copy at project site during submittals, planning, and progress of the specific work, until Substantial Completion.
- E. Should specified reference standards conflict with Contract Documents, request clarification from Architect before proceeding.
- F. Neither the contractual relationships, duties, or responsibilities of the parties in Contract nor those of Architect shall be altered from the Contract Documents by mention or inference otherwise in any reference document.

**1.07 TESTING AND INSPECTION AGENCIES**

- A. Owner will employ and pay for services of an independent testing agency to perform specified testing and inspection.
- B. Employment of agency in no way relieves Contractor of obligation to perform Work in accordance with requirements of Contract Documents.

**PART 2 PRODUCTS - NOT USED**

**PART 3 EXECUTION**

**3.01 CONTROL OF INSTALLATION**

- A. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce Work of specified quality.
- B. Comply with manufacturers' instructions, including each step in sequence.
- C. Should manufacturers' instructions conflict with Contract Documents, request clarification from Architect before proceeding.
- D. Comply with specified standards as minimum quality for the Work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
- E. Have Work performed by persons qualified to produce required and specified quality.
- F. Verify that field measurements are as indicated on shop drawings or as instructed by the manufacturer.
- G. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, and disfigurement.

**3.02 MOCK-UPS**

- A. Locations: As directed by Architect.
- B. Tests will be performed under provisions identified in this section and identified in the respective product specification sections.
- C. Assemble and erect specified items with specified attachment and anchorage devices, flashings, seals, and finishes.
- D. Accepted mock-ups shall be a comparison standard for the remaining Work.
- E. Where mock-up has been accepted by Architect and is specified in product specification sections to be removed, remove mock-up and clear area when directed to do so.

**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 required.
- B. Testing and Inspection Log:
  - 1. Prepare a record of tests and inspections. Include the following:
    - a. Date test or inspection was conducted.
    - b. Description of the Work tested or inspected.
    - c. Date test or inspection results were transmitted to Architect.
    - d. Identification of testing agency or special inspector conducting test or inspection.
  - 2. Maintain log at Project site. Post changes and modifications as they occur. Provide access to test and inspection log for Architect's reference during normal working hours.
- 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 Architect and Contractor of observed irregularities or non-conformance of Work or products.
  - 6. Perform additional tests and inspections required by Architect.
  - 7. Attend preconstruction meetings and progress meetings when requested by Owner.
  - 8. Submit reports of all tests/inspections specified.
- D. Limits on Testing/Inspection Agency Authority:
  - 1. Agency may not release, revoke, alter, or enlarge on requirements of Contract Documents.
  - 2. Agency may not approve or accept any portion of the Work.
  - 3. Agency may not assume any duties of Contractor.
  - 4. Agency has no authority to stop the Work.
- E. Contractor Responsibilities:
  - 1. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.
  - 2. Deliver to agency at designated location, adequate samples of materials proposed to be used that require testing, along with proposed mix designs.
  - 3. Cooperate with laboratory personnel, and provide access to the Work and to manufacturers' facilities.
  - 4. 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.
  - 5. Notify Architect and laboratory 24 hours prior to expected time for operations requiring testing/inspection services.
  - 6. Employ services of an independent qualified testing laboratory and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.
  - 7. Arrange with Owner's agency and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.
  - 8. Testing and Inspection Log: Prepare a record of tests and inspections. Include the following:
    - a. Date test or inspection was conducted.
    - b. Description of the Work tested or inspected.
    - c. Date test or inspection results were transmitted to Architect.
    - d. Identification of testing agency or special inspector conducting test or inspection.

- 9. Maintain log at Project site. Post changes and modifications as they occur. Provide access to test and inspection log for Architect's reference during normal working hours.
- F. Re-testing required because of non-conformance to specified requirements shall be performed by the same agency on instructions by Architect.
- G. Re-testing required because of non-conformance to specified requirements shall be paid for by Contractor.
- H. Re-testing required because of non-conformance to specified requirements shall be performed by the same agency on instructions by Architect. Payment for re testing will be charged to the Contractor by deducting testing charges from the Contract Price.

**3.05 SPECIAL TESTS AND INSPECTIONS**

- A. Special Tests and Inspections: Owner will engage a qualified testing agency to conduct special tests and inspections required by authorities having jurisdiction as the responsibility of the Owner, described as follows:
  - 1. As specified in individual specification sections.
  - 2. As identified on the Drawings.
  - 3. As listed in the Building Permit approval.

**3.06 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 observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.

**3.07 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.

**3.08 REPAIR AND PROTECTION**

- A. General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.
  - 1. Provide materials and comply with installation requirements specified in other Specification Sections. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible.
- B. Protect construction exposed by or for quality-control service activities.
- C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

**END OF SECTION**

**TEMPORARY FACILITIES AND CONTROLS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

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

**1.02 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittals procedures.
- B. Site Plan: Show locations of temporary facilities, utility hookups, staging areas, and parking areas for construction personnel.

**1.03 OPERATION**

- A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.

**1.04 TEMPORARY UTILITIES**

- A. Provide and pay for all electrical power, lighting, water, heating and cooling, and ventilation required for construction purposes.
  - 1. Comply with all applicable codes and regulations.
  - 2. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.
- B. Existing facilities may not be used.
- C. New permanent facilities may not be used.
- D. Use trigger-operated nozzles for water hoses, to avoid waste of water.

**1.05 TELECOMMUNICATIONS SERVICES**

- A. Provide, maintain, and pay for telecommunications services to field office at time of project mobilization.
- B. Telecommunications services shall include:
- C. Provide, maintain and pay for facsimile service and a dedicated telephone line to field office at time of project mobilization.

**1.06 TEMPORARY SANITARY FACILITIES**

- A. Provide and maintain required facilities and enclosures. Provide at time of project mobilization.
  - 1. Comply with all applicable codes and regulations.

- B. New permanent facilities may not be used during construction operations.
- C. Maintain daily in clean and sanitary condition.
- D. At end of construction, return facilities to same or better condition as originally found.

**1.07 TEMPORARY HEATING AND VENTILATION**

- A. Provide temporary heating required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of low temperatures or high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed.
- B. Ventilation and Humidity Control: Provide temporary ventilation required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed. Coordinate ventilation requirements to produce ambient condition required and minimize energy consumption.

**1.08 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 .
- C. Provide protection for plants designated to remain. Replace damaged plants.
- D. Protect non-owned vehicular traffic, stored materials, site, and structures from damage.

**1.09 FENCING**

- A. Construction: Commercial grade chain link fence.
- B. Provide 6 foot high fence around construction site; equip with vehicular and pedestrian gates with locks.

**1.10 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.

**1.11 SECURITY**

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

**1.12 VEHICULAR ACCESS AND PARKING**

- A. Coordinate access and haul routes with governing authorities and Owner.
- B. Provide and maintain access to fire hydrants, free of obstructions.
- C. Provide means of removing mud from vehicle wheels before entering streets.
- D. Provide temporary parking areas to accommodate construction personnel. When site space is not adequate, provide additional off-site parking.

- E. Do not allow vehicle parking on existing facility pavement and parking areas.

**1.13 WASTE REMOVAL**

- A. Provide waste removal facilities and services as required to maintain the site in clean and orderly condition.
- B. Provide containers with lids. Remove trash from site weekly.
- C. 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.
- D. Open free-fall chutes are not permitted. Terminate closed chutes into appropriate containers with lids.

**1.14 FIRE PROTECTION**

- A. Temporary Fire Protection: Install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241.
  - 1. Prohibit smoking in construction areas.
  - 2. Supervise welding operations, combustion-type temporary heating units, and similar sources of fire ignition according to requirements of authorities having jurisdiction.
  - 3. Develop and supervise an overall fire-prevention and -protection program for personnel at Project site. Review needs with local fire department and establish procedures to be followed. Instruct personnel in methods and procedures. Post warnings and information.
  - 4. Provide temporary standpipes and hoses for fire protection. Hang hoses with a warning sign stating that hoses are for fire-protection purposes only and are not to be removed. Match hose size with outlet size and equip with suitable nozzles.

**1.15 PROJECT IDENTIFICATION**

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

**1.16 FIELD OFFICES**

- A. Office: Weathertight, with lighting, electrical outlets, heating, cooling equipment, and equipped with sturdy furniture, drawing rack and drawing display table.
- B. Provide space for Project meetings, with table and chairs to accommodate 12 persons.
- C. Locate offices a minimum distance of 30 feet from existing and new structures.

**1.17 REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS**

- A. Remove temporary utilities, equipment, facilities, materials, prior to Substantial Completion inspection.
- B. Remove underground installations to a minimum depth of 2 feet. Grade site as indicated.
- C. Clean and repair damage caused by installation or use of temporary work.
- D. Restore new permanent facilities used during construction to specified condition.

**PART 2 PRODUCTS - NOT USED**

**PART 3 EXECUTION - NOT USED**

**END OF SECTION**

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

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Protection of existing trees from damage.

**1.02 RELATED SECTIONS**

- A. Section 02 41 00 - Demolition
- B. Section 31 23 00 - Earthwork
- C. Section 32 80 00 Irrigation
- D. Section 32 90 00 Planting

**1.03 DEFINITIONS**

- A. Designated Trees: Existing Trees to Remain as indicated on Drawings.
- B. Critical Root Zone (CRZ): The CRZ for trees 4 inches in caliper or smaller shall be an area with a radius at least 5 feet from the trunk. The CRZ for trees over 4 inches in caliper shall be an area with a radius of at least 1 foot 6 inches from the trunk for every 1 inch of caliper size.
- C. Zone of Protection: As indicated on Drawings.

**1.04 POSTING**

- A. When directed, post Designated Trees with Notice sign provided by Owner's Representative. Attach sign to tree with twine or staples, no nails. Maintain and protect the Notice sign until completion of construction. Obtain approval of Owner's Representative prior to removal of sign.

**1.05 NOTICE**

- A. Notify all workers, including subcontractors, of the requirements to protect Designated Trees.

**1.06 PROTECTIVE FENCING**

- A. Install protective fencing around Designated Trees, where shown on Drawings, prior to commencement of any work. Fencing to be a minimum 6 foot chain link, with fence posts securely anchored. Maintain during construction. Adjustments to fence locations are to be approved by the Owner's Representative prior to performing any work within the Zone of Protection.

**1.07 CONSTRUCTION STAGING**

- A. No construction activities are permitted within the protective fencing without prior approval of the Owner's Representative

**1.08 TRENCHING AND EXCAVATION**

- A. All trenching and excavation within the Zone of Protection is to be performed with the use of an air spade or by hand. Obtain Owner's Representative approval of trenching and excavation locations and methods prior to performing any work.

**1.09 ROOT PRUNING**

- A. Prune roots encountered during construction with an approved root-pruning device. Make clean, vertical cuts. Do not leave split or frayed ends. Obtain Owner's Representative approval prior to cutting roots larger than 1 1/2 inches in diameter. Backfill exposed roots with specified Planting Soil as soon as practical.

**1.10 TREE CANOPY PRUNING**

- A. Prune canopies of Designated Trees impacted by construction only upon approval of Owner's Representative. All canopy pruning must be performed by a certified arborist.

**1.11 WATERING**

- A. Water trees if it is judged root removal is necessary for construction and threatens the survival of the tree. Use a slow drip or soaker hose to provide one-inch water per week until completion of construction.

**1.12 PROHIBITED ACTIVITIES**

- A. Cutting of roots larger than 1 1/2 inch diameter or larger without approval.
- B. Damaging tree bark, branches.
- C. Removal of protective fencing or notice posted on trees prior to approval of Owner's Representative.
- D. Activities prohibited within the Critical Root Zone (without prior approval) are, but not limited to: construction, operation of machinery, storage of materials, paving, grading, cutting, filling, travel within, dumping, disposal of liquids, and parking of vehicles and equipment.

**1.13 DAMAGE**

- A. Actual tree damage such as trunk scoring and broken limbs or damaged roots inside the Zone of Protection will be assessed according to the percentage of loss of tree value. Percentage of tree value will be determined by the Owner's Representative. Tree value will be determined from "Evaluation of Landscape Trees, Shrubs, and Other Landscape Plants" by International Society of Arboriculture.

**PART 2 PRODUCTS - NOT USED**

**PART 3 EXECUTION - NOT USED**

**END OF SECTION**



**PRODUCT REQUIREMENTS****PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. General product requirements.
- B. Re-use of existing products.
- C. Transportation, handling, storage and protection.
- D. Product option requirements.
- E. Substitution limitations 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 Bidders: Product options and substitution procedures prior to bid date.
- B. Section 01 10 00 - Summary - : Lists of products to be removed from existing building.
- C. Document 01 60 01 - Substitution Request Form.

**1.03 REFERENCE STANDARDS**

- A. NEMA MG 1 - Motors and Generators; National Electrical Manufacturers Association; 2011.
- B. NFPA 70 - National Electrical Code; National Fire Protection Association; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

**1.04 SUBMITTALS**

- A. Proposed Products List: Submit list of major products proposed for use, with name of manufacturer, trade name, and model number of each product.
  - 1. Submit within 15 days after date of Notice to Proceed.
  - 2. For products specified only by reference standards, list applicable reference standards.
- B. 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.
- C. 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.
- D. 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. Unforeseen historic items encountered remain the property of the Owner; notify Owner promptly upon discovery; protect, remove, handle, and store as directed by Owner.

- C. Existing materials and equipment indicated to be removed, but not to be re-used, relocated, reinstalled, delivered to the Owner, or otherwise indicated as to remain the property of the Owner, become the property of the Contractor; remove from site.
- D. Reused Products: Reused products include materials and equipment previously used in this or other construction, salvaged and refurbished as specified.

**2.02 NEW PRODUCTS**

- A. Provide new products unless specifically required or permitted by the Contract Documents.
- B. DO NOT USE products having any of the following characteristics:
  - 1. Made using or containing CFC's or HCFC's.
- C. Where all other criteria are met, Contractor shall give preference to products that:
  - 1. If used on interior, have lower emissions, as defined in Section 01 61 16.
  - 2. If wet-applied, have lower VOC content, as defined in Section 01 61 16.
  - 3. Have a published GreenScreen Chemical Hazard Analysis.
- D. Motors: Refer to Section 22 05 13, NEMA MG 1 Type. Specific motor type is specified in individual specification sections.
- E. Wiring Terminations: Provide terminal lugs to match branch circuit conductor quantities, sizes, and materials indicated. Size terminal lugs to NFPA 70, include lugs for terminal box.
- F. Cord and Plug: Provide minimum 6 foot cord and plug including grounding connector for connection to electric wiring system. Cord of longer length is specified in individual specification sections.

**2.03 PRODUCT OPTIONS**

- A. Products Specified by Reference Standards or by Description Only: Use any product meeting those standards or description.
- B. Products Specified by Naming One or More Manufacturers: Use a product of one of the manufacturers named and meeting specifications, no options or substitutions allowed.
- C. Products Specified by Naming One or More Manufacturers with a Provision for Substitutions: Submit a request for substitution for any manufacturer not named in accordance with this Section and Document 01 60 01.
- D. Products Specified as the Basis of Design with a list of acceptable manufacturers: Acceptable manufacturers completely equivalent products to the specified Basis of Design is acceptable.

**2.04 MAINTENANCE MATERIALS**

- A. Furnish extra materials, spare parts, tools, and software of types and in quantities specified in individual specification sections.
- B. Deliver to Project site; obtain receipt prior to final payment.

**PART 3 EXECUTION**

**3.01 SUBSTITUTION PROCEDURES**

- A. Instructions to Bidders specify time restrictions for submitting requests for substitutions during the bidding period. Comply with requirements specified in this section.
- B. After date of contract, the Owner may, at its option, consider formal requests from Contractor for substitution of products for those specified. One or more of the following conditions must be documented:
  - 1. Compliance with final interpretation of code requirements or insurance regulations.
  - 2. Unavailability of a specified Product through no fault of the Contractor.
  - 3. Inability of specified Product to perform properly or fit in designated place.

4. Manufacturer's or fabricator's refusal to certify or guarantee performance of a specified product.
- C. Document each request with complete data substantiating compliance of proposed substitution with Contract Documents.
- D. Submit requests for substitution on Form following this Section.
- E. 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 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.
  5. Will reimburse Owner and Architect for review or redesign services associated with re-approval by authorities.
- F. 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.
- G. Substitution Submittal Procedure:
1. Submit three copies of Request for Substitution Form, Document 01 60 01 for consideration. Limit each request to one proposed substitution.
  2. Submit shop drawings, product data, and certified test results attesting to the proposed product equivalence. Burden of proof is on proposer.
  3. The Architect will notify Contractor in writing of decision to accept or reject request during construction. During bidding, Architect will make notification of acceptance as noted on Addenda.
  4. During bidding, Architect will make notification of acceptance as noted on Addenda.
  5. Documentation which may be required:
    - a. Statement indicating why specified material or product cannot be provided.
    - b. Coordination information, including a list of changes or modifications needed to other parts of the Work and to construction performed by Owner and separate contractors, that will be necessary to accommodate proposed substitution.
    - c. Detailed comparison of significant qualities of proposed substitution with those of the Work specified. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
    - d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
    - e. Provide MSDS information to confirm that the product is no more harmful than the products specified.
    - f. Samples, where applicable or requested.
    - g. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners.
    - h. Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
    - i. Research/evaluation reports evidencing compliance with building code in effect for Project, from a model code organization acceptable to authorities having jurisdiction.
    - j. Detailed comparison of Contractor's Construction Schedule using proposed substitution with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating lack of availability or delays in delivery.
    - k. Cost information, including a proposal of change, if any, in the Contract Sum.
    - l. Contractor's certification that proposed substitution complies with requirements in the Contract Documents and is appropriate for applications indicated.

- m. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.
- 6. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within 7 days of receipt of a request for substitution. Architect will notify Contractor of acceptance or rejection of proposed substitution within 15 days of receipt of request, or 7 days of receipt of additional information or documentation, whichever is later.
  - a. Form of Acceptance: Change Order.
  - b. Use product specified if Architect cannot make a decision on use of a proposed substitution within time allocated.

**3.02 OWNER-SUPPLIED PRODUCTS**

- A. See Section 01 10 00 - Summary for identification of Owner-supplied products.
- B. Owner's Responsibilities:
  - 1. Arrange for and deliver Owner reviewed shop drawings, product data, and samples, to Contractor.
  - 2. Arrange and pay for product delivery to site.
  - 3. On delivery, inspect products jointly with Contractor.
  - 4. Submit claims for transportation damage and replace damaged, defective, or deficient items.
  - 5. Arrange for manufacturers' warranties, inspections, and service.
- C. Contractor's Responsibilities:
  - 1. Review Owner reviewed shop drawings, product data, and samples.
  - 2. Receive and unload products at site; inspect for completeness or damage jointly with Owner.
  - 3. Handle, store, install and finish products.
  - 4. Repair or replace items damaged after receipt.

**3.03 TRANSPORTATION AND HANDLING**

- A. Coordinate schedule of product delivery to designated prepared areas in order to minimize site storage time and potential damage to stored materials.
- B. Transport and handle products in accordance with manufacturer's instructions.
- C. Transport materials in covered trucks to prevent contamination of product and littering of surrounding areas.
- D. Promptly inspect shipments to ensure that products comply with requirements, quantities are correct, and products are undamaged.
- E. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage.
- F. Arrange for the return of packing materials, such as wood pallets, where economically feasible.

**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.
- 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. Provide bonded off-site storage and protection when site does not permit on-site storage or protection.
- G. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of products.
- H. Prevent contact with material that may cause corrosion, discoloration, or staining.
- I. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.
- J. Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.

**3.05 PRODUCT WARRANTIES**

- A. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.
  - 1. Manufacturer's Warranty: Preprinted written warranty published by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.
  - 2. Special Warranty: Written warranty required by or incorporated into the Contract Documents, either to extend time limit provided by manufacturer's warranty or to provide more rights for Owner.

**END OF SECTION**

**SUBSTITUTION REQUEST FORM**

TO: Robertson/Sherwood/Architects pc  
132 East Broadway - Suite 540  
Eugene, Oregon 97401

Deadline for requests:  
March 1, 2015

PROJECT: Roosevelt Middle School  
Eugene School District 4J

SPECIFIED ITEM: \_\_\_\_\_  
                                    Section No.                                      Paragraph                                      Description

The Undersigned requests consideration of the following substitution:

\_\_\_\_\_

The Undersigned states that the following paragraphs are true, except where noted otherwise:

- 1. The function, appearance and quality of the proposed substitution are equivalent or superior to the specified item;
- 2. The proposed substitution does not affect dimensions shown on the Drawings;
- 3. The Undersigned will pay for changes to the building design, including engineering and design services, detailing and construction costs caused by the requested substitution;
- 4. The proposed substitution will have no adverse affect on other trades, the construction schedule, or specified warranty requirements;
- 5. Maintenance and service parts will be locally available for the proposed substitution;
- 6. The Undersigned has attached data concerning the proposed substitution, including: Manufacturers product description, specifications, drawings, photographs, performance and test data, adequate for evaluation of the request, with applicable portions of the data clearly indicated. Attachments also include description of changes to Contract Documents which the proposed substitution will require for its proper installation.

Submitted by: _____ Signature: _____ Firm: _____ Address: _____ _____ Date: _____ Tel: _____ Fax: _____ Attachments: _____ _____	For use by Architect: <input type="checkbox"/> Approved <input type="checkbox"/> Approved as noted. <input type="checkbox"/> Not Approved <input type="checkbox"/> Received too late By: _____ Date: _____ _____ For use by 4J Project Manager: <input type="checkbox"/> Approved <input type="checkbox"/> Approved as noted. <input type="checkbox"/> Not Approved <input type="checkbox"/> Received too late By: _____ Date: _____ _____
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**END OF FORM**

## DELEGATED DESIGN

### PART 1 GENERAL

#### 1.01 SUMMARY

- A. This Section includes administrative and procedural requirements for Delegated Design of components and related deferred submittals to permitting agencies.
- B. Sections with delegated design components include but are not limited to the following:
  - 1. Section 03 45 00 - Precast Architectural Concrete: Precast stair and tread components.
  - 2. Section 05 21 00 - Steel Joist Framing: Design and detailing.
  - 3. Section 05 51 00 - Metal Stairs and Railings: Design and detailing.
  - 4. Section 05 52 12 - Exterior Metal Railings: Design and anchorage.
  - 5. Section 05 52 13 - Pipe and Tube Railing: Design and anchorage.
  - 6. Section 06 17 33 - Pre-Fabricated Plywood I Joists: Design and anchorage.
  - 7. Section 06 17 36 - Metal-Web Wood Joists: Design and anchorage.
  - 8. Section 08 52 13 - Glazed Aluminum Curtain Walls: Design and anchorage.
  - 9. Section 09 22 26 - Suspension Systems: Seismic anchorage.
  - 10. Section 09 51 00 - Acoustical Ceiling: Seismic anchorage.
  - 11. Section 11 24 25 - Roof Mounted Fall Protection: Design and anchorage.
  - 12. Section 21 10 00 - Water Based Fire-Suppression Systems: Final design.
  - 13. Section 26 06 30 - Photovoltaic System: Final design.
  - 14. Section 28 30 01 - Fire Detection and Communication: Final design.
- C. Project Record Document Requirements.

#### 1.02 DEFINITIONS

- A. Delegated Design: Certain components of the Work for which Contractor shall coordinate and assume or assign responsibility for design, engineering, calculations, submittals, fabrication, transportation, and installation. (Also called "Design-Build" components)
  - 1. Delegated Design components shall be complete systems that perform their intended functions.
- B. Permit Authority: All authorities having local jurisdiction.
- C. Architect/Engineer of Record: Robertson Sherwood Architects pc or their consulting engineer.

#### 1.03 PERFORMANCE REQUIREMENTS

- A. Permit: Submit design and calculations to the Permit Authority and secure permit for Delegated Design component:
  - 1. Separate approval is required for each Delegated Design component.
  - 2. Pay for permit and permit review.
- B. Comply with current codes and regulations, except where more stringent requirements are specified.
- C. Clearly define load reactions at the interface between Delegated Design components and structural frame to allow review by Owner and Architect.
  - 1. Note loads that are different from loads anticipated in the Contract Documents with special marking.
  - 2. Coordinate connections with appropriate subcontractors.
- D. Provide Delegated Design components that match as closely as possible to the design indicated in Contract Documents.

#### 1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
  - 1. Submit to Owner and Architect prior to submitting to Permit Authority
  - 2. Architect will return copies for submittal to Permit Authority with "Reviewed" stamp.

3. Delegated Design Submittal is in addition to product data, shop drawing and sample submittals.
- B. Indicate design criteria, design assumptions, details, calculations, submittals, instructions for fabrication, assembly, installation and interface with other trades, unless noted otherwise in the specific Specification Section.
- C. Design and Calculations: Engineer's seal and calculations for that portion of Work.
1. Submittals without required calculations, without the Delegated Design Engineer's seal, or which have not been reviewed by Contractor will not be reviewed by Architect or Engineer of Record.
- D. Permit Authority Requirements:
1. Comply with Permit Authority policies regarding Delegated Design components of building projects.
  2. Three sets of design drawings clearly and legibly showing all members, dimensions, connections, materials used, and indicating how the part is attached to the main structure.
    - a. Drawings shall be prepared, designed, and sealed by an Engineer licensed by the State of Oregon to practice as such.
    - b. Drawings shall be signed indicating General Design Conformance by Architect or Engineer of Record.
    - c. Shop drawings or erection drawings are not acceptable as Delegated Design drawings.
    - d. One set of calculations including criteria, design assumptions, substantiating computations, and such additional data sufficient to show the correctness of the plans and compliance with the structural provisions of the Building Code
      - 1) Calculations shall be prepared and sealed by the Delegated Design Engineer who prepared and sealed the drawings.
      - 2) Calculations shall be signed by the Architect or Engineer of Record indicating acceptance of design concepts, loading criteria, and compatibility of designs.
    - e. Submit a Contractor Design Summary Sheet (when required by Permit Authority) listing Delegated Design subcontractors and their registered Delegated Design Engineer's name and phone number prior to main permit issuance.
- E. Architect's or Engineer of Record's review of Delegated Design submittals will be for design intent and shall not lessen nor shift the responsibility from Contractor or the assigned subcontractor to Owner nor to the design professional.
- F. Project Record Documents and electronic format requirements for delegated design components and systems
1. Provide the Owner with two (2) copies of all Record Document drawings and specifications in electronic form on CD Rom as follows:
  2. Content:
    - a. Record Documents shall contain all revisions made to the project by Addenda, Change Orders, shop drawing review and other modifications. The files shall be compiled as follows:
    - b. Update all delegated design CAD files indicating the as-built conditions.
    - c. The Contractor shall add the following, (see Format):
      - 1) Measured horizontal and vertical dimensions and locations of delegated design components and systems.
      - 2) Measured locations of 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 and associated with the delegated design.
      - 5) Note to be included on each Sheet of Record Documents: "Project Record Documents - This document has been prepared using information furnished by (list Design Source Contractor Name, date, etc.)."
  3. Format:
    - a. Files saved in latest AutoCAD format.
    - b. All external reference files are to be bound, but need not be exploded.



- c. There should be only one (1) file for each and every drawing sheet. The file name will include the sheet number. For example A41.dwg, E32 dwg, or L2 dwg will include the Architects' project number is optional but should be consistent through-out all drawings.
- d. No more than one (1) Paper Space layout per drawing. Files are to be saved as they should look ready to plot, and will exactly match the plotted Record Documents.
- e. Information added to the CAD files by the contractors, such as measured depths of foundations and utility location dimensions should be put on a separate layer. These are to begin with an X, for example "X-GenC-Note" for notes, or "X-GenC-Dims" for dimensions.
- f. Other CAD information modified or moved by the Contractor should be located on its original layers.

#### **1.05 QUALITY ASSURANCE**

- A. Documentation: Comply with the following:
  - 1. Uniform Drawing System
  - 2. Minimum text size: 1/8 inch
  - 3. Legible when microfilmed
  - 4. Other requirements by Permit Authority
- B. Design Requirements: Refer to requirements within individual specification sections.
- C. Delegated Design Engineer Qualifications: A professional engineer who is legally qualified to practice in the State or Oregon and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of Delegated Design components that are similar to those indicated for this Project in material, design, and extent.

#### **1.06 SCHEDULING AND COORDINATION**

- A. Submit material required by Permit Authority so that Permit Authority's review will not adversely affect construction schedule.
- B. Prior to submittal, meet with Permit Authority to identify Delegated Design components and review submittal requirements.
  - 1. Completed submission of Delegated Design documents prior to issuance of the building permit, when required by Permit Authority.
  - 2. Permit for Delegated Design must be issued and paid prior to fabrication.
- C. Owner will not be responsible for paying for any delays, additional products, additional hours of work, overtime, restocking or rework required due to failure by the Contractor to coordinate Delegated Design work or to execute Delegated Design work in a timely manner.

#### **PART 2 PRODUCTS (NOT USED)**

#### **PART 3 EXECUTION (NOT USED)**

**END OF SECTION**

**EXECUTION AND CLOSEOUT REQUIREMENTS****PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Examination, preparation, and general installation procedures.
- B. Pre-installation meetings.
- C. Cutting and patching.
- D. Surveying for laying out the work.
- E. Cleaning and protection.
- F. Starting of systems and equipment.
- G. Closeout procedures, except payment procedures.
- H. General requirements for maintenance service.

**1.02 RELATED REQUIREMENTS**

- A. Section 01 30 00 - Administrative Requirements: Submittals procedures.
- B. Section 01 40 00 - Quality Requirements: Testing and inspection procedures.
- C. Section 01 50 00 - Temporary Facilities and Controls: Temporary exterior enclosures.
- D. Section 01 78 00 - Closeout Submittals: Project record documents, operation and maintenance data, warranties and bonds.
- E. Section 02 41 00 - Demolition: Demolition of whole structures and parts thereof; site utility demolition.

**1.03 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Survey work: Submit name, address, and telephone number of Surveyor before starting survey work.
  - 1. On request, submit documentation verifying accuracy of survey work.
  - 2. Submit a copy of site drawing signed by the Land Surveyor, that the elevations and locations of the work are in conformance with Contract Documents.
  - 3. Submit surveys and survey logs for the project record.
- C. Cutting and Patching: Submit written request in advance of cutting or alteration that affects:
  - 1. Structural integrity of any element of Project.
  - 2. Integrity of weather exposed or moisture resistant element.
  - 3. Efficiency, maintenance, or safety of any operational element.
  - 4. Visual qualities of sight exposed elements.
  - 5. Work of Owner or separate Contractor.

**1.04 QUALIFICATIONS**

- A. For demolition work, employ a firm specializing in the type of work required.
- B. For survey work, employ a land surveyor registered in Oregon and acceptable to Architect. Submit evidence of Surveyor's Errors and Omissions insurance coverage in the form of an Insurance Certificate.

**1.05 PROJECT CONDITIONS**

- A. Examination of Existing Conditions:

1. The existence and location of site improvements, utilities, and other construction indicated as existing are not guaranteed. Before beginning work, investigate and verify the existence and location of mechanical and electrical systems and other construction affecting the Work.
  2. Before construction, verify the location and points of connection of utility services.
- B. Existing Utilities: 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 affecting the Work.
1. Before construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, and water-service piping; and underground electrical services.
  2. Furnish location data for work related to Project that must be performed by public utilities serving Project site.
- C. Use of explosives is not permitted.
- D. Grade site to drain. Maintain excavations free of water. Provide, operate, and maintain pumping equipment.
- E. Protect site from puddling or running water. Provide water barriers as required to protect site from soil erosion.
- F. Ventilate enclosed areas to assist cure of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases.
- G. Dust Control: Execute work by methods to minimize raising dust from construction operations. Provide positive means to prevent air-borne dust from dispersing into atmosphere and over adjacent property.
- H. Erosion and Sediment Control: Plan and execute work by methods to control surface drainage from cuts and fills, from borrow and waste disposal areas. Prevent erosion and sedimentation.
- I. Noise Control: Provide methods, means, and facilities to minimize noise produced by construction operations.
- J. Pest and Rodent Control: Provide methods, means, and facilities to prevent pests and insects from damaging the work.
- K. Rodent Control: Provide methods, means, and facilities to prevent rodents from accessing or invading premises.
- L. Pollution Control: Provide methods, means, and facilities to prevent contamination of soil, water, and atmosphere from discharge of noxious, toxic substances, and pollutants produced by construction operations. Comply with federal, state, and local regulations.

#### **1.06 COORDINATION**

- A. See Section 01 10 00 for occupancy-related requirements.
- B. Coordinate scheduling, submittals, and work of the various sections of the Project Manual to ensure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.
- C. Notify affected utility companies and comply with their requirements.
- D. Verify that utility requirements and characteristics of new operating equipment are compatible with building utilities. Coordinate work of various sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.
- E. Coordinate space requirements, supports, and installation of mechanical and electrical work that are indicated diagrammatically on Drawings. Follow routing shown for pipes, ducts, and conduit, as closely as practicable; place runs parallel with lines of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.

- F. In finished areas except as otherwise indicated, conceal pipes, ducts, and wiring within the construction. Coordinate locations of fixtures and outlets with finish elements.
- G. Coordinate completion and clean-up of work of separate sections.
- H. After Owner occupancy of premises, coordinate access to site for correction of defective work and work not in accordance with Contract Documents, to minimize disruption of Owner's activities.

## **PART 2 PRODUCTS**

### **2.01 PATCHING MATERIALS**

- A. New Materials: As specified in product sections; match existing products and work for patching and extending work.
- B. Type and Quality of Existing Products: Determine by inspecting and testing products where necessary, referring to existing work as a standard.
- C. Product Substitution: For any proposed change in materials, submit request for substitution described in Section 01 60 00.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify that existing site conditions and substrate surfaces are acceptable for subsequent work. Start of work means acceptance of existing conditions.
- B. Verify that existing substrate is capable of structural support or attachment of new work being applied or attached.
- C. Examine and verify specific conditions described in individual specification sections.
- D. Take field measurements before confirming product orders or beginning fabrication, to minimize waste due to over-ordering or misfabrication.
- E. Verify that utility services are available, of the correct characteristics, and in the correct locations.
- F. Prior to Cutting: Examine existing conditions prior to commencing work, including elements subject to damage or movement during cutting and patching. After uncovering existing work, assess conditions affecting performance of work. Beginning of cutting or patching means acceptance of existing conditions.

### **3.02 PREPARATION**

- A. Clean substrate surfaces prior to applying next material or substance.
- B. Seal cracks or openings of substrate prior to applying next material or substance.
- C. Apply manufacturer required or recommended substrate primer, sealer, or conditioner prior to applying any new material or substance in contact or bond.

### **3.03 PREINSTALLATION MEETINGS**

- A. When required in individual specification sections, convene a preinstallation meeting at the site prior to commencing work of the section.
- B. Require attendance of parties directly affecting, or affected by, work of the specific section.
- C. Notify Architect four days in advance of meeting date.
- D. Prepare agenda and preside at meeting:
  1. Review conditions of examination, preparation and installation procedures.
  2. Review coordination with related work.

- E. Record minutes and distribute copies within two days after meeting to participants, with two copies to Architect, Owner, participants, and those affected by decisions made.

### **3.04 LAYING OUT THE WORK**

- A. Verify locations of survey control points prior to starting work.
- B. Promptly notify Architect of any discrepancies discovered.
- C. Contractor shall locate and protect survey control and reference points.
- D. Control datum for survey is that indicated on Drawings.
- E. Protect survey control points prior to starting site work; preserve permanent reference points during construction.
- F. Promptly report to Architect the loss or destruction of any reference point or relocation required because of changes in grades or other reasons.
- G. Replace dislocated survey control points based on original survey control. Make no changes without prior written notice to Architect.
- H. Utilize recognized engineering survey practices.
- I. Establish a minimum of two permanent bench marks on site, referenced to established control points. Record locations, with horizontal and vertical data, on project record documents.
- J. Establish elevations, lines and levels. Locate and lay out by instrumentation and similar appropriate means:
  1. Site improvements including pavements; stakes for grading, fill and topsoil placement; utility locations, slopes, and invert elevations.
  2. Grid or axis for structures.
  3. Building foundation, column locations, ground floor elevations.
- K. Periodically verify layouts by same means.
- L. Maintain a complete and accurate log of control and survey work as it progresses.
- M. On completion of foundation walls and major site improvements, prepare a certified survey illustrating dimensions, locations, angles, and elevations of construction and site work.

### **3.05 GENERAL INSTALLATION REQUIREMENTS**

- A. Install products as specified in individual sections, in accordance with manufacturer's instructions and recommendations, and so as to avoid waste due to necessity for replacement.
- B. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.
- C. Make vertical elements plumb and horizontal elements level, unless otherwise indicated.
- D. Install equipment and fittings plumb and level, neatly aligned with adjacent vertical and horizontal lines, unless otherwise indicated.
- E. Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints where possible. Obtain Architect and Owner's Project Manager approval for all questionable conditions.
- F. Make consistent texture on surfaces, with seamless transitions, unless otherwise indicated.
- G. Make neat transitions between different surfaces, maintaining texture and appearance.
- H. Templates: Obtain and distribute to the parties involved templates for work specified to be factory prepared and field installed. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.

- I. Anchors and Fasteners: Provide anchors and fasteners as required to anchor each component securely in place, accurately located and aligned with other portions of the Work.
  - 1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Architect.
  - 2. Allow for building movement, including thermal expansion and contraction.
  - 3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

### **3.06 OWNER-INSTALLED PRODUCTS**

- A. Site Access: Provide access to Project site for Owner's construction forces.
- B. Coordination: Coordinate construction and operations of the Work with work performed by Owner's construction forces.
  - 1. Construction Schedule: Inform Owner of Contractor's preferred construction schedule for Owner's portion of the Work. Adjust construction schedule based on a mutually agreeable timetable. Notify Owner if changes to schedule are required due to differences in actual construction progress.
  - 2. Preinstallation Conferences: Include Owner's construction forces at preinstallation conferences covering portions of the Work that are to receive Owner's work. Attend preinstallation conferences conducted by Owner's construction forces if portions of the Work depend on Owner's construction.

### **3.07 CUTTING AND PATCHING**

- A. Whenever possible, execute the work by methods that avoid cutting or patching.
- B. Cutting and Patching Proposal: Submit a written request describing procedures prior to the time cutting and patching will be performed, requesting approval to proceed, for cutting or alteration which affects:
  - 1. Structural integrity of any element of Project.
  - 2. Integrity of weather-exposed or moisture-resistant element.
  - 3. Efficiency, maintenance, or safety of any operational element.
  - 4. Visual qualities of site-exposed elements.
  - 5. Work of Owner or separate contractor.
- C. Perform whatever cutting and patching is necessary to:
  - 1. Complete the work.
  - 2. Fit products together to integrate with other work.
  - 3. Provide openings for penetration of mechanical, electrical, and other services.
  - 4. Match work that has been cut to adjacent work.
  - 5. Repair areas adjacent to cuts to required condition.
  - 6. Repair new work damaged by subsequent work.
  - 7. Remove samples of installed work for testing when requested.
  - 8. Remove and replace defective and non-conforming work.
- D. Execute cutting and patching including excavation and fill to complete the work, to uncover work in order to install improperly sequenced work, to remove and replace defective or non-conforming work, to remove samples of installed work for testing when requested, to provide openings in the work for penetration of mechanical and electrical work, to execute patching to complement adjacent work, and to fit products together to integrate with other work.
- E. Execute work by methods that avoid damage to other work and that will provide appropriate surfaces to receive patching and finishing. In existing work, minimize damage and restore to original condition.
- F. Employ original installer to perform cutting for weather exposed and moisture resistant elements, and sight exposed surfaces.

- G. Cut rigid materials using masonry saw or core drill. Pneumatic tools not allowed without prior approval.
- H. Restore work with new products in accordance with requirements of Contract Documents.
- I. Fit work air tight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.
- J. At penetrations of fire rated walls, partitions, ceiling, or floor construction, completely seal voids with fire rated material in accordance with Section 07 84 00, to full thickness of the penetrated element.
- K. Patching:
  - 1. Finish patched surfaces to match finish that existed prior to patching. On continuous surfaces, refinish to nearest intersection or natural break. For an assembly, refinish entire unit.
  - 2. Match color, texture, and appearance.
  - 3. Repair patched surfaces that are damaged, lifted, discolored, or showing other imperfections due to patching work. If defects are due to condition of substrate, repair substrate prior to repairing finish.
- L. Refinish surfaces to match adjacent finish. For continuous surfaces, refinish to nearest intersection or natural break. For an assembly, refinish entire unit.
- M. Make neat transitions. Patch work to match adjacent work in texture and appearance. Where new work abuts or aligns with existing, perform a smooth and even transition.
- N. Structural Elements: Do not cut and patch structural elements in a manner that could change their load-carrying capacity or load-deflection ratio.
  - 1. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety.
  - 2. Miscellaneous Elements: Do not cut and patch miscellaneous elements or related components in a manner that could change their load-carrying capacity, that results in reducing their capacity to perform as intended, or that results in increased maintenance or decreased operational life or safety.
- O. Visual Requirements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch construction exposed on the exterior or in occupied spaces in a manner that would, in Architect's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.

### **3.08 PROGRESS CLEANING**

- A. Clean Project site and work areas daily, including common areas. Coordinate progress cleaning for joint-use areas where more than one installer has worked. Enforce requirements strictly.
- B. Maintain areas free of waste materials, debris, and rubbish. Maintain site in a clean and orderly condition.
- C. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces, and other closed or remote spaces, prior to enclosing the space.
- D. Broom and vacuum clean interior areas prior to start of surface finishing, and continue cleaning to eliminate dust.
- E. Collect and remove waste materials, debris, and trash/rubbish from site weekly and dispose off-site; do not burn or bury.
- F. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for safety and proper execution of the Work.
  - 1. Remove liquid spills promptly.

- 2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.
- G. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.
- H. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.
- I. Exposed Surfaces in Finished Areas: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.
- J. Limiting Exposures: Supervise construction operations to assure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

### **3.09 PROTECTION OF INSTALLED WORK**

- A. Protect installed work from damage by construction operations.
- B. Provide special protection where specified in individual specification sections.
- C. Provide temporary and removable protection for installed products. Control activity in immediate work area to prevent damage.
- D. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.
- E. Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.
- F. Prohibit traffic or storage upon waterproofed or roofed surfaces. If traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer.
- G. Remove protective coverings when no longer needed; reuse or recycle plastic coverings if possible.

### **3.10 SYSTEM STARTUP**

- A. Coordinate with Owner's Commissioning Agent.
- B. Coordinate schedule for start-up of various equipment and systems.
- C. Notify Architect and owner seven days prior to start-up of each item.
- D. Verify that each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, control sequence, and for conditions that may cause damage.
- E. Verify tests, meter readings, and specified electrical characteristics agree with those required by the equipment or system manufacturer.
- F. Verify that wiring and support components for equipment are complete and tested.
- G. Execute start-up under supervision of applicable Contractor personnel and manufacturer's representative in accordance with manufacturers' instructions.
- H. When specified in individual specification Sections, require manufacturer to provide authorized representative to be present at site to inspect, check, and approve equipment or system installation prior to start-up, and to supervise placing equipment or system in operation.
- I. Submit a written report that equipment or system has been properly installed and is functioning correctly.

### **3.11 ADJUSTING**

- A. Adjust operating products and equipment to ensure smooth and unhindered operation.



**3.12 FINAL CLEANING**

- A. Execute final cleaning prior to Substantial Completion.
- B. Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.
- C. Use cleaning materials that are nonhazardous.
- D. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
- E. Clean interior and exterior glass, surfaces exposed to view; remove temporary labels, stains and foreign substances, polish transparent and glossy surfaces, vacuum carpeted and soft surfaces.
- F. Remove all labels that are not permanent. Do not paint or otherwise cover fire test labels or nameplates on mechanical and electrical equipment.
- G. Clean equipment and fixtures to a sanitary condition with cleaning materials appropriate to the surface and material being cleaned.
- H. Wipe surfaces of mechanical and electrical equipment, and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
- I. Replace parts subject to unusual operating conditions.
- J. Clean exposed surfaces of diffusers, registers, and grills.
- K. Clean ducts, blowers, and coils if units were operated without filters during construction.
- L. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency. Replace burned-out bulbs, and those noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.
- M. Replace filters of operating equipment.
- N. Clean debris from roofs, gutters, downspouts, and drainage systems.
- O. Clean site; sweep paved areas, rake clean landscaped surfaces.
- P. Remove waste, surplus materials, trash/rubbish, and construction facilities from the site; dispose of in legal manner; do not burn or bury.
- Q. Leave Project clean and ready for occupancy.

**3.13 PRE-CLOSEOUT PROCEDURES**

- A. Preliminary Procedures: Before requesting inspection for determining date of Substantial Completion, complete the following. List items below that are incomplete in request.
  - 1. Prepare a list of items to be completed and corrected (punch list), the value of items on the list, and reasons why the Work is not complete.
  - 2. Advise Owner of pending insurance changeover requirements.
  - 3. Submit specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
  - 4. Obtain and submit releases permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
  - 5. Prepare and submit Project Record Documents, operation and maintenance manuals, damage or settlement surveys, property surveys, and similar final record information.
  - 6. Deliver tools, spare parts, extra materials, and similar items to location designated by Owner. Label with manufacturer's name and model number where applicable.
  - 7. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.

8. Complete startup testing of systems.
9. Submit test/adjust/balance records.
10. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
11. Advise Owner of changeover in heat and other utilities.
12. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.
13. Complete final cleaning requirements, including touchup painting.
14. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.

**3.14 CLOSEOUT PROCEDURES - SUBSTANTIAL COMPLETION**

- A. Make submittals that are required by governing or other authorities. Obtain a Certificate of Occupancy from the Authorities Having Jurisdiction.
  1. Provide copies to Architect and Owner.
- B. Submit a written notification to Architect when work is considered ready for Substantial Completion.
  1. Certify that Contract Documents have been reviewed, work has been inspected, and that work is complete in accordance with Contract Documents and ready for Architect's review.
  2. Provide a complete list of incomplete work and Contractor identified defects and deficiencies.
- C. Architect will make inspection to determine if the project is Substantially Complete.
  1. Architect will notify the Contractor of items, either on the Contractor's list or additional items identified by Architect, that must be completed or corrected before issuing a Certificate of Substantial Completion.
- D. Complete all items identified by Architect preventing Substantial Completion status. Notify Architect in writing after items have been corrected.
- E. Architect will reinspect the work to verify completion of identified items. If acceptable, Architect will prepare a Certificate of Substantial Completion which may list additional items for the Contractor to complete.
- F. Correct items of work listed in executed Certificates of Substantial Completion and comply with requirements for access to Owner-occupied areas.
- G. Notify Architect when work is considered finally complete.
- H. Complete items of work determined by Architect's final inspection.
- I. Remaining issues in Commissioning Issues Log have been resolved to the satisfaction of the Owner.

**3.15 CLOSEOUT PROCEDURES - FINAL COMPLETION**

- A. Before requesting final inspection for determining date of Final Completion, complete the following:
  1. Revise five subparagraphs below to match the Supplementary Conditions.
  2. Submit a final Application for Payment according to Division 1 Section "Payment Procedures."
  3. Submit certified copy of Architect's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Architect. The certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
  4. Submit evidence of final, continuing insurance coverage complying with insurance requirements.
  5. Submit the following completed forms, items and documents:
    - a. AIA Document G706 Contractor's Affidavit of Payment of Debts and Claims.
    - b. AIA Document G706A Contractor's Affidavit of Release of Liens.
    - c. AIA Document G707 Consent of Surety Company to Final Payment.
    - d. Operation and Maintenance Manuals

- e. Warranties and Bonds. Submit original documents, including Contractor's General Warranty,
  - f. Record Documents.
  - g. Keys.
  - h. Testing and Start-Up records.
  - i. Affidavit of Prevailing Wages paid.
  - j. Complete list of Contractor and all Subcontractors with address, phone numbers, and work
  - k. Asbestos-Containing Materials Statement (Form 01 10 00 B).
  - l. Proof of final acceptance and compliance from governing authorities having jurisdiction.
  - m. Certificate of insurance evidencing continuation of liability coverage including coverage for completed operations until the expiration of the specified warranty periods.
6. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems.
- B. Notify Architect when work is considered finally complete. Architect will make inspection and determine if project is complete. If not, Architect will provide Contractor with a list of items to be completed.
- C. Complete items of work determined by Architect's final inspection.
- D. Remaining issues in Commissioning Issues Log have been resolved to the satisfaction of the Owner.

**3.16 MAINTENANCE**

- A. Provide service and maintenance of components indicated in specification sections.
- B. Maintenance Period: As indicated in specification sections or, if not indicated, not less than one year from the Date of Substantial Completion or the length of the specified warranty, whichever is longer.
- C. Examine system components at a frequency consistent with reliable operation. Clean, adjust, and lubricate as required.
- D. Include systematic examination, adjustment, and lubrication of components. Repair or replace parts whenever required. Use parts produced by the manufacturer of the original component.
- E. Maintenance service shall not be assigned or transferred to any agent or subcontractor without prior written consent of the Owner.

**END OF SECTION**

**CLOSEOUT SUBMITTALS****PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Project Record Documents.
- B. Operation and Maintenance Data.
- C. Warranties and bonds.

**1.02 RELATED REQUIREMENTS**

- A. Section 00 72 00 - General Conditions: Performance bond and labor and material payment bonds, warranty, and correction of work.
- B. Section 01 30 00 - Administrative Requirements: Submittals procedures, shop drawings, product data, and samples.
- C. Section 01 70 00 - Execution and Closeout Requirements: Contract closeout procedures.
- D. Individual Product Sections: Specific requirements for operation and maintenance data.
- E. Individual Product Sections: Warranties required for specific products or Work.

**1.03 SUBMITTALS**

- A. Project Record Documents: Submit documents to Architect with claim for final Application for Payment.
- B. Record Documents:
  - 1. Submit one copy of Record Drawings and Record Project Manual.
    - a. Organize Record Prints and newly prepared Record Drawings into manageable sets.
    - b. Bind each set with durable paper cover sheets. Include identification on cover sheets.
  - 2. Submit one copy of Record Transparencies of Record Drawings.
    - a. Organize into unbound sets matching Record Prints.
    - b. Place transparencies in durable tube-type drawing containers with end caps.
    - c. Mark end cap of each container with identification. If container does not include a complete set, identify Drawings included.
  - 3. Identification: As follows:
    - a. Project name.
    - b. Date.
    - c. Designation "PROJECT RECORD DRAWINGS."
    - d. Name of Architect and Owner's Project Manager.
    - e. Name of Contractor.
- C. 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 days after acceptance.
  - 3. Submit one copy of completed documents 15 days prior to final inspection. This copy will be reviewed and returned after final inspection, with Architect comments. Revise content of all document sets as required prior to final submission.
  - 4. Submit two sets of revised final documents in final form within 10 days after final inspection.
- D. Warranties and Bonds:
  - 1. For equipment or component parts of equipment put into service during construction with Owner's permission, submit documents within 10 days after acceptance.
  - 2. Make other submittals within 10 days after Date of Substantial Completion, prior to final Application for Payment.

3. For items of Work for which acceptance is delayed beyond Date of Substantial Completion, submit within 10 days after acceptance, listing the date of acceptance as the beginning of the warranty period.

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

## **PART 3 EXECUTION**

### **3.01 PROJECT RECORD DOCUMENTS**

- A. Maintain on site one set of the following record documents; record actual revisions to the Work:
  1. Drawings.
  2. Specifications.
  3. Addenda.
  4. Change Orders and other modifications to the Contract.
  5. Reviewed shop drawings, product data, and samples.
  6. Manufacturer's instruction for assembly, installation, and adjusting.
- B. Ensure entries are complete and accurate, enabling future reference by Owner.
- C. Store record documents separate from documents used for construction.
- D. Record information concurrent with construction progress.
- E. Mark the Contract Drawings or Shop Drawings, whichever is most capable of showing actual physical conditions, completely and accurately. If Shop Drawings are marked, show cross-reference on the Contract Drawings.
- F. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
- G. Mark important additional information that was either shown schematically or omitted from original Drawings.
- H. Note Alternate numbers, Change Order numbers, and similar identification, where applicable.
- I. Specifications: Legibly mark and record at each product section description of actual products installed, including the following:
  1. Manufacturer's name and product model and number.
  2. Product substitutions or alternates utilized.
  3. Changes made by Addenda and modifications.
- J. Product Data: Assemble one copy each required Product Data Submittal.
  1. Where Record Product Data is required as part of operation and maintenance manuals, submit marked-up Product Data as an insert in manual instead of submittal as Record Product Data.
- K. Record Drawings and Shop Drawings: Legibly mark each item to record actual construction including:
  1. Measured depths of foundations in relation to finish first floor datum.
  2. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
  3. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
  4. Field changes of dimension and detail.
  5. Revisions to routing of piping and conduits.
  6. Revisions to electrical circuitry.
  7. Actual equipment locations.
  8. Duct size and routing.
  9. Locations of concealed internal utilities.
  10. Changes made by Change Order.
  11. Changes made following Architect's written orders
  12. Record information on the Work that is shown only schematically.

13. Details not on original Contract drawings.

### **3.02 OPERATION AND MAINTENANCE DATA**

- A. Source Data: For each product or system, list names, addresses and telephone numbers of Subcontractors and suppliers, including local source of supplies and replacement parts.
- B. Product Data: Mark each sheet to clearly identify specific products and component parts, and data applicable to installation. Delete inapplicable information.
- C. Drawings: Supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams. 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.

### **3.03 OPERATION AND MAINTENANCE DATA FOR MATERIALS AND FINISHES**

- A. For Each Product, Applied Material, and Finish:
  - 1. Product data, with catalog number, size, composition, and color and texture designations.
  - 2. Information for re-ordering custom manufactured products.
- B. Instructions for Care and Maintenance: Manufacturer's recommendations for cleaning agents and methods, precautions against detrimental cleaning agents and methods, and recommended schedule for cleaning and maintenance.
- C. Moisture protection and weather-exposed products: Include product data listing applicable reference standards, chemical composition, and details of installation. Provide recommendations for inspections, maintenance, and repair.
- D. Additional information as specified in individual product specification sections.
- E. Where additional instructions are required, beyond the manufacturer's standard printed instructions, have instructions prepared by personnel experienced in the operation and maintenance of the specific products.
- F. Provide a listing in Table of Contents for design data, with tabbed fly sheet and space for insertion of data.

### **3.04 OPERATION AND MAINTENANCE DATA FOR EQUIPMENT AND SYSTEMS**

- A. For Each Item of Equipment and Each System:
  - 1. Description of unit or system, and component parts.
  - 2. Identify function, normal operating characteristics, and limiting conditions.
  - 3. Include performance curves, with engineering data and tests.
  - 4. Complete nomenclature and model number of replaceable parts.
- B. Where additional instructions are required, beyond the manufacturer's standard printed instructions, have instructions prepared by personnel experienced in the operation and maintenance of the specific products.
- C. Panelboard Circuit Directories: Provide electrical service characteristics, controls, and communications; typed.
- D. Include color coded wiring diagrams as installed.
- E. 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.
- F. Maintenance Requirements: Include routine procedures and guide for preventative maintenance and trouble shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.

- G. Provide servicing and lubrication schedule, and list of lubricants required.
- H. Include manufacturer's printed operation and maintenance instructions.
- I. Include sequence of operation by controls manufacturer.
- J. Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.
- K. Provide control diagrams by controls manufacturer as installed.
- L. Provide Contractor's coordination drawings, with color coded piping diagrams as installed.
- M. Provide charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.
- N. Provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.
- O. Include test and balancing reports.
- P. Additional Requirements: As specified in individual product specification sections.

### **3.05 ASSEMBLY OF OPERATION AND MAINTENANCE MANUALS**

- A. Assemble operation and maintenance data into durable manuals for Owner's personnel use, with data arranged in the same sequence as, and identified by, the specification sections.
- B. Where systems involve more than one specification section, provide separate tabbed divider for each system.
- C. 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.
- 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. Photocopies of warranties and bonds.
- N. Provide a listing in Table of Contents for design data, with tabbed dividers and space for insertion of data.
- O. Table of Contents: Provide title of Project; names, addresses, and telephone numbers of Architect, Consultants, and Contractor with name of responsible parties; schedule of products and systems, indexed to content of the volume.

### **3.06 WARRANTIES AND BONDS**

- A. Obtain warranties and bonds, executed in duplicate by responsible Subcontractors, suppliers, and manufacturers, within 10 days after completion of the applicable item of work. Except for items put into use with Owner's permission, leave date of beginning of time of warranty until the Date of Substantial completion is determined.
- B. Verify that documents are in proper form, contain full information, and are notarized.
- C. Co-execute submittals when required.
- D. Retain warranties and bonds until time specified for submittal.
- E. Manual: Bind in commercial quality 8-1/2 by 11 inch three D side ring binders with durable plastic covers.
- F. 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.
- G. 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.
- H. 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.

**END OF SECTION**



## DEMONSTRATION AND TRAINING

### PART 1 GENERAL

#### 1.01 SUMMARY

- A. Demonstration of products and systems to be commissioned and where indicated in specific specification sections.
- B. Training of Owner personnel in operation and maintenance is required for:
  1. All software-operated systems.
  2. HVAC systems and equipment.
  3. Plumbing equipment.
  4. Electrical systems and equipment.
  5. Landscape irrigation.
  6. Elevators.
  7. Items specified in individual product Sections.
- C. Training of Owner personnel in care, cleaning, maintenance, and repair is required for:
  1. Roofing, waterproofing, and other weather-exposed or moisture protection products.
  2. Finishes, including flooring, wall finishes, ceiling finishes.
  3. Fixtures and fittings.
  4. Items specified in individual product Sections.

#### 1.02 RELATED REQUIREMENTS

- A. Section 01 78 00 - Closeout Submittals: Operation and maintenance manuals.
- B. Other Specification Sections: Additional requirements for demonstration and training.

#### 1.03 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures; except:
  1. Make all submittals specified in this section, and elsewhere where indicated for commissioning purposes, directly to the Commissioning Authority.
  2. Submit one copy to the Commissioning Authority, not to be returned.
  3. Make commissioning submittals on time schedule specified by Commissioning Authority.
  4. Submittals indicated as "Draft" are intended for the use of the Commissioning Authority in preparation of overall Training Plan; submit in editable electronic format, Microsoft Word 2003 preferred.
- B. Draft Training Plans: Owner will designate personnel to be trained; tailor training to needs and skill-level of attendees.
  1. Submit to Architect for transmittal to Owner.
  2. Submit to Commissioning Authority for review and inclusion in overall training plan.
  3. Submit not less than four weeks prior to start of training.
  4. Revise and resubmit until acceptable.
  5. Provide an overall schedule showing all training sessions.
  6. Include at least the following for each training session:
    - a. Identification, date, time, and duration.
    - b. Description of products and/or systems to be covered.
    - c. Name of firm and person conducting training; include qualifications.
    - d. Intended audience, such as job description.
    - e. Objectives of training and suggested methods of ensuring adequate training.
    - f. Methods to be used, such as classroom lecture, live demonstrations, hands-on, etc.
    - g. Media to be used, such as slides, hand-outs, etc.
    - h. Training equipment required, such as projector, projection screen, etc., to be provided by Contractor.
- C. Training Manuals: Provide training manual for each attendee; allow for minimum of two attendees per training session.
  1. Include applicable portion of O&M manuals.

2. Include copies of all hand-outs, slides, overheads, video presentations, etc., that are not included in O&M manuals.
3. Provide one extra copy of each training manual to be included with operation and maintenance data.

D. Training Reports:

1. Identification of each training session, date, time, and duration.
2. Sign-in sheet showing names and job titles of attendees.
3. List of attendee questions and written answers given, including copies of and references to supporting documentation required for clarification; include answers to questions that could not be answered in original training session.
4. Include Commissioning Authority's formal acceptance of training session.

**1.04 QUALITY ASSURANCE**

- A. Instructor Qualifications: Familiar with design, operation, maintenance and troubleshooting of the relevant products and systems.
  1. Provide as instructors the most qualified trainer of those contractors and/or installers who actually supplied and installed the systems and equipment.
  2. Where a single person is not familiar with all aspects, provide specialists with necessary qualifications.

**PART 2 PRODUCTS - NOT USED**

**PART 3 EXECUTION**

**3.01 DEMONSTRATION - GENERAL**

- A. Demonstrations conducted during system start-up do not qualify as demonstrations for the purposes of this section, unless approved in advance by Owner.
- B. Demonstrations conducted during Functional Testing need not be repeated unless Owner personnel training is specified.
- C. Demonstration may be combined with Owner personnel training if applicable.
- D. Operating Equipment and Systems: Demonstrate operation in all modes, including start-up, shut-down, seasonal changeover, emergency conditions, and troubleshooting, and maintenance procedures, including scheduled and preventive maintenance.
  1. Perform demonstrations not less than two weeks prior to Substantial Completion.
  2. For equipment or systems requiring seasonal operation, perform demonstration for other season within six months.
- E. Non-Operating Products: Demonstrate cleaning, scheduled and preventive maintenance, and repair procedures.
  1. Perform demonstrations not less than two weeks prior to Substantial Completion.

**3.02 TRAINING - GENERAL**

- A. Commissioning Authority will prepare the Training Plan based on draft plans submitted.
- B. Conduct training on-site unless otherwise indicated.
- C. Owner will provide classroom and seating at no cost to Contractor.
- D. Do not start training until Functional Testing is complete, unless otherwise specified or approved by the Commissioning Authority.
- E. Provide training in minimum two hour segments.
- F. The Commissioning Authority is responsible for determining that the training was satisfactorily completed and will provide approval forms.

- G. Training schedule will be subject to availability of Owner's personnel to be trained; re-schedule training sessions as required by Owner; once schedule has been approved by Owner failure to conduct sessions according to schedule will be cause for Owner to charge Contractor for personnel "show-up" time.
- H. Review of Facility Policy on Operation and Maintenance Data: During training discuss:
  - 1. The location of the O&M manuals and procedures for use and preservation; backup copies.
  - 2. Typical contents and organization of all manuals, including explanatory information, system narratives, and product specific information.
  - 3. Typical uses of the O&M manuals.
- I. Product- and System-Specific Training:
  - 1. Review the applicable O&M manuals.
  - 2. For systems, provide an overview of system operation, design parameters and constraints, and operational strategies.
  - 3. Review instructions for proper operation in all modes, including start-up, shut-down, seasonal changeover and emergency procedures, and for maintenance, including preventative maintenance.
  - 4. Provide hands-on training on all operational modes possible and preventive maintenance.
  - 5. Emphasize safe and proper operating requirements; discuss relevant health and safety issues and emergency procedures.
  - 6. Discuss common troubleshooting problems and solutions.
  - 7. Discuss any peculiarities of equipment installation or operation.
  - 8. Discuss warranties and guarantees, including procedures necessary to avoid voiding coverage.
  - 9. Review recommended tools and spare parts inventory suggestions of manufacturers.
  - 10. Review spare parts and tools required to be furnished by Contractor.
  - 11. Review spare parts suppliers and sources and procurement procedures.
- J. Be prepared to answer questions raised by training attendees; if unable to answer during training session, provide written response within three days.

**END OF SECTION**

**GENERAL COMMISSIONING REQUIREMENTS****PART 1 GENERAL****1.01 SUMMARY**

- A. Commissioning is intended to achieve the following specific objectives; this section specifies the Contractor's responsibilities for commissioning:
  1. Verify that the work is installed in accordance with the Contract Documents and the manufacturer's recommendations and instructions, and that it receives adequate operational checkout prior to startup: Startup reports and Prefunctional Checklists executed by Contractor are utilized to achieve this.
  2. Verify and document that functional performance is in accordance with the Contract Documents: Functional Tests executed by Contractor and witnessed by the Commissioning Authority are utilized to achieve this.
  3. Verify that operation and maintenance manuals submitted to Owner are complete: Detailed operation and maintenance (O&M) data submittals by Contractor are utilized to achieve this.
  4. Verify that the Owner's operating personnel are adequately trained: Formal training conducted by Contractor is utilized to achieve this.
- B. Commissioning, including Functional Tests, O&M documentation review, and training, is to occur after startup and initial checkout and be completed before Substantial Completion
- C. The Commissioning Authority directs and coordinates all commissioning activities; this section describes some but not all of the Commissioning Authority's responsibilities.
- D. The Commissioning Authority is employed by Owner.

**1.02 SCOPE OF COMMISSIONING**

- A. The following are to be commissioned:
- B. Building Envelope Components:
  1. SRAB.
  2. Single ply roof membrane system, including SRAB installation.
  3. Flashing.
  4. Sealant joints.
- C. Plumbing Systems:
  1. Water heaters.
  2. Booster pumps.
  3. Landscape irrigation.
- D. HVAC System, including:
  1. Major and minor equipment items.
  2. Piping systems and equipment.
  3. Ductwork and accessories.
  4. Terminal units.
  5. Control system.
  6. Sound control devices.
  7. Vibration control devices.
  8. Variable frequency drives.
- E. Special Ventilation:
  1. Fume hoods.
  2. Specialty fans.
- F. Electrical Systems:
  1. Power quality.
  2. Emergency power systems.
  3. Uninterruptible power systems.
  4. Lighting controls other than manual switches.

- G. Electronic Safety and Security:
  1. Security system, including doors and hardware.
  2. Fire and smoke alarms.
- H. Communications:
  1. Voice and data systems.
  2. Public address/paging.
- I. Other equipment and systems explicitly identified elsewhere in Contract Documents as requiring commissioning.

**1.03 RELATED REQUIREMENTS**

- A. Section 01 78 00 - Closeout Submittals: Scope and procedures for operation and maintenance manuals and project record documents.
- B. Section 23 08 00 - Commissioning of HVAC: HVAC control system testing; other requirements.

**1.04 REFERENCE STANDARDS**

- A. PEI (Samples) - Sample Forms for Prefunctional Checklists and Functional Performance Tests; Portland Energy Conservation, Inc.; located at <http://www.peci.org/library/mcpgs.htm>; current edition.

**1.05 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures; except:
  1. Make all submittals specified in this section, and elsewhere where indicated for commissioning purposes, directly to the Commissioning Authority, unless they require review by Architect; in that case, submit to both at same time. Commissioning comments to be reviewed by Architect and incorporated into their comments.
  2. Submit one copy to the Commissioning Authority, not to be returned.
  3. Make commissioning submittals on time schedule specified by Commissioning Authority.
  4. Submittals indicated as "Draft" are intended for the use of the Commissioning Authority in preparation of Prefunctional Checklists or Functional Test requirements; submit in editable electronic format, Microsoft Word 2010 preferred.
  5. Submit copies of approved submittal to the Commissioning Authority and the Architect at the same time. Commissioning comments to be reviewed by Architect and incorporated into their comments.
- B. Manufacturers' Instructions: Submit copies of all manufacturer-provided instructions that are shipped with the equipment as soon as the equipment is delivered.
- C. Product Data: If submittals to Architect do not include the following, submit copies as soon as possible:
  1. Manufacturer's product data, cut sheets, and shop drawings.
  2. Manufacturer's installation instructions.
  3. Startup, operating, and troubleshooting procedures.
  4. Fan and pump curves.
  5. Factory test reports.
  6. Warranty information, including details of Owner's responsibilities in regard to keeping warranties in force.
  7. Spare parts list.
  8. Special tools list.
- D. Startup Plans and Reports.
- E. Completed Prefunctional Checklists: Submit on Commissioning Agent approved checklist forms.

**PART 2 PRODUCTS****2.01 TEST EQUIPMENT**

- A. Provide all standard testing equipment required to perform startup and initial checkout and required Functional Testing; unless otherwise noted such testing equipment will NOT become the property of Owner.
- B. Calibration Tolerances: Provide testing equipment of sufficient quality and accuracy to test and/or measure system performance with the tolerances specified. If not otherwise noted, the following minimum requirements apply:
  - 1. Temperature Sensors and Digital Thermometers: Certified calibration within past year to accuracy of 0.5 degree F and resolution of plus/minus 0.1 degree F.
  - 2. Pressure Sensors: Accuracy of plus/minus 2.0 percent of the value range being measured (not full range of meter), calibrated within the last year.
  - 3. Calibration: According to the manufacturer's recommended intervals and when dropped or damaged; affix calibration tags or keep certificates readily available for inspection.
- C. Equipment-Specific Tools: Where special testing equipment, tools and instruments are specific to a piece of equipment, are only available from the vendor, and are required in order to accomplish startup or Functional Testing, provide such equipment, tools, and instruments as part of the work at no extra cost to Owner; such equipment, tools, and instruments are to become the property of Owner.
- D. Dataloggers: Independent equipment and software for monitoring flows, currents, status, pressures, etc. of equipment.
  - 1. Dataloggers required for Functional Tests will be provided by the Commissioning Authority and will not become the property of Owner.

**PART 3 EXECUTION****3.01 COMMISSIONING PLAN**

- A. Commissioning Authority has prepared the Commissioning Plan.
  - 1. Attend meetings called by the Commissioning Authority for purposes of completing the commissioning plan.
  - 2. Require attendance and participation of relevant subcontractors, installers, suppliers, and manufacturer representatives.
- B. Contractor is responsible for compliance with the Commissioning Plan.
- C. Commissioning Plan: The commissioning schedule, procedures, and coordination requirements for all parties in the commissioning process.
- D. Commissioning Schedule:
  - 1. Submit anticipated dates of startup of each item of equipment and system to Commissioning Authority within 60 days after award of Contract.
  - 2. Re-submit anticipated startup dates monthly, but not less than 4 weeks prior to startup.
  - 3. Prefunctional Checklists and Functional Tests are to be performed in sequence from components, to subsystems, to systems.
  - 4. Provide sufficient notice to Commissioning Authority for delivery of relevant Checklists and Functional Test procedures, to avoid delay, minimum of 5 working days before functional testing to begin.

**3.02 STARTUP PLANS AND REPORTS**

- A. Startup Plans: For each item of equipment and system for which the manufacturer provides a startup plan, submit the plan not less than 8 weeks prior to startup. Also include procedure for startup.

- B. Startup Reports: For each item of equipment and system for which the manufacturer provides a startup checklist (or startup plan or field checkout sheet), document compliance by submitting the completed startup checklist prior to startup, signed and dated by responsible entity.
- C. Submit directly to the Commissioning Authority within 5 days or per Commissioning Plan.

### 3.03 PREFUNCTIONAL CHECKLISTS

- A. A Prefunctional Checklist is required to be filled out for each item of equipment or other assembly specified to be commissioned. Contractor to provide a checklist to Commissioning Agent for approval before use.
  - 1. No sampling of identical or near-identical items is allowed.
  - 2. These checklists do not replace manufacturers' recommended startup checklists, regardless of apparent redundancy.
  - 3. Prefunctional Checklist forms will not be complete until after award of the contract; the following types of information will be gathered via the completed Checklist forms:
    - a. Certification by installing contractor that the unit is properly installed, started up, and operating and ready for Functional Testing.
    - b. Confirmation of receipt of each shop drawing and commissioning submittal specified, itemized by unit.
    - c. Manufacturer, model number, and relevant capacity information; list information "as specified," "as submitted," and "as installed."
    - d. Serial number of installed unit.
    - e. List of inspections to be conducted to document proper installation prior to startup and Functional Testing; these will be primarily static inspections and procedures; for equipment and systems may include normal manufacturer's start-up checklist items and minor testing.
    - f. Sensor and actuator calibration information.
    - g. Running Amperage/RPM/etc.
  - 4. Samples of Prefunctioning Checklist forms provided by Commissioning Agent.
- B. Contractor is responsible for filling out Prefunctional Checklists, after completion of installation and before startup; witnessing by the Commissioning Authority is not required unless otherwise specified.
  - 1. Each line item without deficiency is to be witnessed, initialed, and dated by the actual witness; checklists are not complete until all line items are initialed and dated complete without deficiencies.
  - 2. Checklists with incomplete items may be submitted for approval provided the Contractor attests that incomplete items do not preclude the performance of safe and reliable Functional Testing; re-submission of the Checklist is required upon completion of remaining items.
  - 3. Individual Checklists may contain line items that are the responsibility of more than one installer; Contractor shall assign responsibility to appropriate installers or subcontractors, with identification recorded on the form.
  - 4. If any Checklist line item is not relevant, record reasons on the form.
  - 5. Contractor may independently perform startup inspections and/or tests, at his option.
  - 6. Regardless of these reporting requirements, Contractor is responsible for correct startup and operation.
  - 7. Submit completed Checklists to Commissioning Authority within two days of completion.
- C. Commissioning Authority is responsible for approving the Prefunctional Checklists used by the Contractor and provided by Commissioning Agent.
  - 1. Initial Drafts: Contractor is responsible for initial draft of Prefunctional Checklist where so indicated in the Contract Documents.
  - 2. Provide all additional information requested by Commissioning Authority to aid in preparation of checklists, such as shop drawing submittals, manufacturers' startup checklists, and O&M data.
  - 3. Commissioning Authority may add any relevant items deemed necessary regardless of whether they are explicitly mentioned in the Contract Documents or not.

4. When asked to review the proposed Checklists, do so in a timely manner. Same turn around as Architect has reviewing documents.
- D. Commissioning Authority Witnessing: Required for:
1. Each piece of primary equipment, unless sampling of multiple similar units is allowed by the commissioning plan.
  2. A sampling of non-primary equipment, as allowed by the commissioning plan.
- E. Deficiencies: Correct deficiencies and re-inspect or re-test, as applicable, at no extra cost to Owner.
1. If difficulty in correction would delay progress, report deficiency to the Commissioning Authority immediately.
  2. Owner pays for successful tests, Contractor pays for failed tests.

### 3.04 FUNCTIONAL TESTS

- A. A Functional Test is required for each item of equipment, system, or other assembly specified to be commissioned, unless sampling of multiple identical or near-identical units is allowed by the final test procedures.
- B. Contractor is responsible for execution of required Functional Tests, after completion of Prefunctional Checklist and before closeout.
- C. Commissioning Authority is responsible for witnessing and reporting results of Functional Tests, including preparation and completion of forms for that purpose.
- D. Contractor is responsible for correction of deficiencies and re-testing at no extra cost to Owner; if a deficiency is not corrected and re-tested immediately, the Commissioning Authority will document the deficiency and the Contractor's stated intentions regarding correction.
1. Deficiencies are any condition in the installation or function of a component, piece of equipment or system that is not in compliance with the Contract Documents or does not perform properly.
  2. When the deficiency has been corrected, the Contractor completes the form certifying that the item is ready to be re-tested and returns the form to the Commissioning Authority; the Commissioning Authority will reschedule the test and the Contractor shall re-test.
  3. Identical or Near-Identical Items: If 10 percent, or three, whichever is greater, of identical or near-identical items fail to perform due to material or manufacturing defect, all items will be considered defective; provide a proposal for correction within 2 weeks after notification of defect, including provision for testing sample installations prior to replacement of all items.
  4. Contractor shall bear the cost of Owner and Commissioning Authority personnel time witnessing re-testing.
  5. Contractor shall bear the cost of Owner and Commissioning Authority personnel time witnessing re-testing if the test failed due to failure to execute the relevant Prefunctional Checklist correctly; if the test failed for reasons that would not have been identified in the Prefunctional Checklist process, Contractor shall bear the cost of the second and subsequent re-tests.
  6. Commissioning Agent may direct additional testing to isolate potential deficiencies.
- E. Functional Test Procedures:
1. Some test procedures are included in the Contract Documents; where Functional Test procedures are not included in the Contract Documents, test procedures will be determined by the Commissioning Authority with input by and coordination with Contractor and Design Engineer.
  2. Examples of Functional Testing:
    - a. Test the dynamic function and operation of equipment and systems (rather than just components) using manual (direct observation) or monitoring methods under full operation (e.g., the chiller pump is tested interactively with the chiller functions to see if the pump ramps up and down to maintain the differential pressure setpoint).
    - b. Systems are tested under various modes, such as during low cooling or heating loads, high loads, component failures, unoccupied, varying outside air temperatures, fire alarm, power failure, etc.



- c. Systems are run through all the HVAC control system's sequences of operation and components are verified to be responding as the sequence's state.
  - d. Traditional air or water test and balancing (TAB) is not Functional Testing; spot checking of TAB by demonstration to the Commissioning Authority is Functional Testing.
3. Samples of Functional Test forms provided by Commissioning Agent.
- F. Deferred Functional Tests: Some tests may need to be performed later, after substantial completion, due to partial occupancy, equipment, seasonal requirements, design or other site conditions; performance of these tests remains the Contractor's responsibility regardless of timing.

### 3.05 SENSOR AND ACTUATOR CALIBRATION

- A. Calibrate all field-installed temperature, relative humidity, carbon monoxide, carbon dioxide, and pressure sensors and gages, and all actuators (dampers and valves) on this piece of equipment shall be calibrated. Sensors installed in the unit at the factory with calibration certification provided need not be field calibrated.
- B. Calibrate using the methods described below; alternate methods may be used, if approved by Owner beforehand. See PART 2 for test instrument requirements. Record methods used on the relevant Prefunctional Checklist or other suitable forms, documenting initial, intermediate and final results.
- C. All Sensors:
  - 1. Verify that sensor location is appropriate and away from potential causes of erratic operation.
  - 2. Verify that sensors with shielded cable are grounded only at one end.
  - 3. For sensor pairs that are used to determine a temperature or pressure difference, for temperature make sure they are reading within 0.2 degree F of each other, and for pressure, within tolerance equal to 2 percent of the reading, of each other.
  - 4. Tolerances for critical applications may be tighter.
- D. Sensors Without Transmitters - Standard Application:
  - 1. Make a reading with a calibrated test instrument within 6 inches of the site sensor.
  - 2. Verify that the sensor reading, via the permanent thermostat, gage or building automation system, is within the tolerances in the table below of the instrument-measured value.
  - 3. If not, install offset, calibrate or replace sensor.
- E. Sensors With Transmitters - Standard Application.
  - 1. Disconnect sensor.
  - 2. Connect a signal generator in place of sensor.
  - 3. Connect ammeter in series between transmitter and building automation system control panel.
  - 4. Using manufacturer's resistance-temperature data, simulate minimum desired temperature.
  - 5. Adjust transmitter potentiometer zero until 4 mA is read by the ammeter.
  - 6. Repeat for the maximum temperature matching 20 mA to the potentiometer span or maximum and verify at the building automation system.
  - 7. Record all values and recalibrate controller as necessary to conform with specified control ramps, reset schedules, proportional relationship, reset relationship and P/I reaction.
  - 8. Reconnect sensor.
  - 9. Make a reading with a calibrated test instrument within 6 inches of the site sensor.
  - 10. Verify that the sensor reading, via the permanent thermostat, gage or building automation system, is within the tolerances in the table below of the instrument-measured value.
  - 11. If not, replace sensor and repeat.
  - 12. For pressure sensors, perform a similar process with a suitable signal generator.
- F. Sensor Tolerances for Standard Applications: Plus/minus the following maximums:
  - 1. Watthour, Voltage, Amperage: 1 percent of design.
  - 2. Pressure, Air, Water, Gas: 3 percent of design.
  - 3. Air Temperatures (Outside Air, Space Air, Duct Air): 0.4 degrees F.
  - 4. Relative Humidity: 4 percent of design.

5. Barometric Pressure: 0.1 inch of Hg.
  6. Flow Rate, Air: 10 percent of design.
  7. Flow Rate, Water: 4 percent of design.
  8. AHU Wet Bulb and Dew Point: 2.0 degrees F.
  9. Hot Water Coil and Boiler Water Temperature: 1.5 degrees F.
  10. Cooling Coil, Chilled and Condenser Water Temperatures: 0.4 degrees F.
  11. Combustion Flue Temperature: 5.0 degrees F.
  12. Oxygen and CO<sub>2</sub> Monitors: 0.1 percentage points.
  13. CO Monitor: 0.01 percentage points.
  14. Natural Gas and Oil Flow Rate: 1 percent of design.
- G. Critical Applications: For some applications more rigorous calibration techniques may be required for selected sensors. Describe any such methods used on an attached sheet.
- H. Valve/Damper Stroke Setup and Check:
1. For all valve/damper actuator positions checked, verify the actual position against the control system readout.
  2. Set pump/fan to normal operating mode.
  3. Command valve/damper closed; visually verify that valve/damper is closed and adjust output zero signal as required.
  4. Command valve/damper to open; verify position is full open and adjust output signal as required.
  5. Command valve/damper to a few intermediate positions.
  6. If actual valve/damper position does not reasonably correspond, replace actuator or add pilot positioner (for pneumatics).
- I. Isolation Valve or System Valve Leak Check: For valves not associated with coils.
1. With full pressure in the system, command valve closed.
  2. Use an ultra-sonic flow meter to detect flow or leakage.

### 3.06 TEST PROCEDURES - GENERAL

- A. Provide skilled technicians to execute starting of equipment and to execute the Functional Tests. Ensure that they are available and present during the agreed upon schedules and for sufficient duration to complete the necessary tests, adjustments and problem-solving.
- B. Provide all necessary materials and system modifications required to produce the flows, pressures, temperatures, and conditions necessary to execute the test according to the specified conditions. At completion of the test, return all affected equipment and systems to their pre-test condition.
- C. Sampling: Where Functional Testing of fewer than the total number of multiple identical or near-identical items is explicitly permitted, perform sampling as follows:
1. Identical Units: Defined as units with same application and sequence of operation; only minor size or capacity difference.
  2. Sampling is not allowed for:
    - a. Major equipment.
    - b. Life-safety-critical equipment.
    - c. Prefunctional Checklist execution.
  3. XX = the percent of the group of identical equipment to be included in each sample; defined for specific type of equipment.
  4. YY = the percent of the sample that if failed will require another sample to be tested; defined for specific type of equipment.
  5. Randomly test at least XX percent of each group of identical equipment, but not less than three units. This constitutes the "first sample."
  6. If YY percent of the units in the first sample fail, test another XX percent of the remaining identical units.
  7. If YY percent of the units in the second sample fail, test all remaining identical units.

8. If frequent failures occur, resulting in more troubleshooting than testing, the Commissioning Authority may stop the testing and require Contractor to perform and document a checkout of the remaining units prior to continuing testing.
- D. Manual Testing: Use hand-held instruments, immediate control system readouts, or direct observation to verify performance (contrasted to analyzing monitored data taken over time to make the "observation").
- E. Simulating Conditions: Artificially create the necessary condition for the purpose of testing the response of a system; for example apply hot air to a space sensor using a hair dryer to see the response in a VAV box.
- F. Simulating Signals: Disconnect the sensor and use a signal generator to send an amperage, resistance or pressure to the transducer and control system to simulate the sensor value.
- G. Over-Writing Values: Change the sensor value known to the control system in the control system to see the response of the system; for example, change the outside air temperature value from 50 degrees F to 75 degrees F to verify economizer operation.
- H. Indirect Indicators: Remote indicators of a response or condition, such as a reading from a control system screen reporting a damper to be 100 percent closed, are considered indirect indicators.
- I. Monitoring: Record parameters (flow, current, status, pressure, etc.) of equipment operation using dataloggers or the trending capabilities of the relevant control systems; where monitoring of specific points is called for in Functional Test Procedures:
  1. All points that are monitored by the relevant control system shall be trended by Contractor; at the Commissioning Authority's request, Contractor shall trend up to 20 percent more points than specified at no extra charge.
  2. Other points will be monitored by the Commissioning Authority using dataloggers.
  3. At the option of the Commissioning Authority, some control system monitoring may be replaced with datalogger monitoring.
  4. Provide hard copies of monitored data in columnar format with time down left column and Commissioning Agent specified grouping of point values on same page.
  5. Graphical output is desirable and is required for all output if the system can produce it.
  6. Monitoring may be used to augment manual testing.

**3.07 OPERATION AND MAINTENANCE MANUALS**

- A. See Section 01 78 00 for additional requirements.
- B. Add design intent documentation furnished by Architect to manuals prior to submission to Owner.
- C. Submit manuals related to items that were commissioned to Commissioning Authority for review; make changes recommended by Commissioning Authority.
- D. Commissioning Authority will add commissioning records to manuals after submission to Owner.

**END OF SECTION**

## DEMOLITION

### PART 1 GENERAL

#### 1.01 SECTION INCLUDES

- A. Building demolition excluding removal of hazardous materials and toxic substances.
- B. Demolition of site construction as indicated on Drawings.
- C. Selective demolition of built site elements.
- D. Removal of existing utilities and utility structures.

#### 1.02 RELATED REQUIREMENTS

- A. Section 00 31 00 - Available Project Information: Existing building survey conducted by Owner; information about known hazardous materials.
- B. Section 01 10 00 - Summary: Limitations on Contractor's use of site and premises.
- C. Section 01 10 00 - Summary: Sequencing and staging requirements.
- D. Section 01 10 00 - Summary: Description of items to be removed by Owner.
- E. Section 01 10 00 - Summary: Description of items to be salvaged or removed for re-use by Contractor.
- F. Section 01 10 00 - Summary: Description of hazardous material abatement work to be completed by Owner under separate contract.
- G. Section 01 50 00 - Temporary Facilities and Controls: Site fences, security, protective barriers, and waste removal.
- H. Section 01 56 39 - Temporary Tree Protection.
- I. Section 01 60 00 - Product Requirements: Handling and storage of items removed for salvage and relocation.
- J. Section 01 70 00 - Execution and Closeout Requirements: Project conditions; protection of bench marks, survey control points, and existing construction to remain; reinstallation of removed products; temporary bracing and shoring.
- K. Section 31 20 00 - Earth Moving: Vegetation and existing debris removal, 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. Project Record Documents: Accurately record actual locations of capped and active utilities and subsurface construction.

#### 1.05 PROJECT CONDITIONS

- A. 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.
- B. Comply with other requirements specified in Section 01 70 00.
- C. Coordinate with Owner on removal of hazardous materials to be abated under separate contract.

**PART 2 PRODUCTS -- NOT USED****PART 3 EXECUTION****3.01 SCOPE**

- A. Remove the entire existing buildings at completion of Phase 1 work.
- B. Remove paving and curbs as required to accomplish new work.
- C. Remove all paving and curbs as indicated on drawings.
- D. Remove all foundation walls and footings.
- E. Remove concrete slabs on grade as indicated on drawings.
- F. Remove below grade utility tunnels and chases at existing building. Coordinate and schedule demolition to allow for asbestos abatement in pipe chases as noted on Drawings. Carefully remove concrete floor slabs in vicinity of pipe chases in order to avoid damage to potential asbestos containing materials. Excavate to two foot depth along one side of each pipe chase in order to expose materials for inspection and potential removal by asbestos contractor.
- G. Remove manholes and manhole covers, curb inlets and catch basins.
- H. Remove fences and gates as indicated on Drawings.
- I. Remove creosote-treated wood utility poles to depth of 36 inches below grade.
- J. Refer to Drawings for additional demolition work.
- K. Remove other items indicated, for salvage and relocation.
- L. Fill excavations, open pits, and holes in ground areas generated as result of removals, using specified fill; compact fill 31 20 00 - Earth Moving.

**3.02 ITEMS TO BE SALVAGED BY OWNER**

- A. The Owner intends to remove and salvage the following items by July 2, 2016:
  - 1. Student Lockers in D wing (west wing).
  - 2. Bleacher boards in Gymnasium.
  - 3. Climbing wall holds in Gymnasiums.
  - 4. Basketball hoops and glass backboards.
  - 5. Projector screen in Gymnasium.
  - 6. White boards.
  - 7. Wood shop equipment
  - 8. Miscellaneous door hardware
  - 9. Stage lights.
  - 10. Miscellaneous light fixtures.
  - 11. Fire alarm system components.
  - 12. Security system components.
  - 13. Classroom technologies, including smart boards, projectors, mounts, wireless devices servers, racks and telephone system.
  - 14. Miscellaneous kitchen equipment not identified for re-use in new building.
  - 15. Eco-lab soap dispensers in Kitchen.
  - 16. T&S spray nozzle in Kitchen.
  - 17. Portable air filtration system in Art Room.
  - 18. Electrical circuit breakers.
  - 19. Water heater in Boiler Room.

**3.03 ITEMS TO BE SALVAGED FOR REINSTALLATION IN NEW WORK**

- A. Remove from the existing building and site before demolition, modify as indicated, store and reinstall the following items in the new work as indicated on Drawings:

1. Bike Racks.
2. Kitchen Serving Line.
3. Kitchen Equipment.
4. Kiln.
5. Commemorative stone with plaque at existing Science Courtyard.

### **3.04 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 required permits.
  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. Use physical barriers to prevent access to areas that could be hazardous to workers or the public.
  5. Conduct operations to minimize effects on and interference with adjacent structures and occupants.
  6. Do not close or obstruct roadways or sidewalks without permit.
  7. Conduct operations to minimize obstruction of public and private entrances and exits; do not obstruct required exits at any time; protect persons using entrances and exits from removal operations.
  8. Obtain written permission from owners of adjacent properties when demolition equipment will traverse, infringe upon or limit access to their property.
- B. Do not begin removal until receipt of notification to proceed from Owner.
- C. Do not begin removal until built elements to be salvaged or relocated have been removed.
- D. Do not begin removal until vegetation to be relocated has been removed and specified measures have been taken to protect vegetation to remain.
- E. Protect existing structures and other elements that are not to be removed.
  1. Provide bracing and shoring.
  2. Prevent movement or settlement of adjacent structures.
  3. Stop work immediately if adjacent structures appear to be in danger.
- F. If hazardous materials are discovered during removal operations, stop work at that location and notify Architect and Owner; hazardous materials include regulated asbestos containing materials, lead, PCB's, and mercury.
- G. Perform demolition in a manner that maximizes salvage and recycling of materials.
  1. Dismantle existing construction and separate materials.
  2. Set aside reusable, recyclable, and salvageable materials; store and deliver to collection point or point of reuse.
- H. Partial Removal of Paving and Curbs: Neatly saw cut at right angle to surface.

### **3.05 EXISTING UTILITIES**

- A. Refer to Drawings for additional information.
- 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. Do not close, shut off, or disrupt existing life safety systems that are in use without at least 7 days prior written notification to Owner.

- F. Do not close, shut off, or disrupt existing utility branches or take-offs that are in use without at least 3 days prior written notification to Owner.
- G. 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.
- H. Remove exposed piping, valves, meters, equipment, supports, and foundations of disconnected and abandoned utilities.
- I. Prepare building demolition areas by disconnecting and capping utilities outside the demolition zone. Upon commencement of demolition of west wing, isolate electrical and plumbing utilities so that such services are available as needed for the asbestos abatement contractor to complete asbestos removal activities in the remaining areas, until completion.

**3.06 DEBRIS AND WASTE REMOVAL**

- A. Remove debris, junk, and trash from site.
- B. Remove from site all materials not to be reused on site; do not burn or bury.
- C. Leave site in clean condition, ready for subsequent work.
- D. Clean up spillage and wind-blown debris from public and private lands.

**END OF SECTION**

**CONCRETE FORMING AND ACCESSORIES**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Formwork for cast-in place concrete, with shoring, bracing and anchorage.
- B. Openings for other work.
- C. Form accessories.
- D. Form stripping.

**1.02 RELATED REQUIREMENTS**

- A. Section 01 40 00 - Quality Requirements: Testing and Inspection Agency.
- B. Section 03 20 00 - Concrete Reinforcing.
- C. Section 03 30 00 - Cast-in-Place Concrete.
- D. Section 05 12 00 - Structural Steel Framing: Placement of embedded steel anchors and plates in cast-in-place concrete.
- E. Section 05 31 00 - Steel Decking: Placement of steel anchors in composite decking.

**1.03 REFERENCE STANDARDS**

- A. ACI 117 - Standard Specifications for Tolerances for Concrete Construction and Materials; 2010.
- B. ACI 301 - Specifications for Structural Concrete for Buildings; American Concrete Institute; 2010.

**1.04 DESIGN REQUIREMENTS**

- A. Design, engineer and construct formwork, shoring and bracing to conform to design and code requirements; resultant concrete to conform to required shape, line and dimension.

**1.05 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on void form materials and installation requirements.
- C. Shop Drawings: Indicate pertinent dimensions, materials, bracing, and arrangement of joints and ties.
- D. Compressible Form Materials: Product data.

**1.06 QUALITY ASSURANCE**

- A. Designer Qualifications: Design formwork under direct supervision of a Professional Structural Engineer experienced in design of concrete formwork and licensed in Oregon.

**1.07 REGULATORY REQUIREMENTS**

- A. Conform to applicable code for design, fabrication, erection and removal of formwork.

**PART 2 PRODUCTS**

**2.01 FORMWORK - GENERAL**

- A. Provide concrete forms, accessories, shoring, and bracing as required to accomplish cast-in-place concrete work.
- B. Design and construct to provide resultant concrete that conforms to design with respect to shape, lines, and dimensions.



- C. Comply with applicable State and local codes with respect to design, fabrication, erection, and removal of formwork.

**2.02 WOOD FORM MATERIALS**

- A. Form Materials: At the discretion of the Contractor.

**2.03 REMOVABLE PREFABRICATED FORMS**

- A. Preformed Steel Forms: Minimum 16 gage, 0.0598 inch thick, matched, tight fitting, stiffened to support weight of concrete without deflection detrimental to tolerances and appearance of finished surfaces.
- B. Tubular Column Type: Round, spirally wound laminated fiber material, surface treated with release agent, non-reusable, of sizes indicated.

**2.04 PERMANENT COMPRESSIBLE FORM MATERIALS**

- A. Description: Corrugated paper material with moisture resistant exterior faces; designed to withstand imposed loads during construction; specifically design for expansive soil conditions.
- B. Board Size: 48 x 96 inches.
- C. Thickness: 2 inches or as indicated on Drawings.
- D. Products:
  1. SlabVoid by SureVoid Products: [www.surevoid.com](http://www.surevoid.com).
  2. Substitutions: See Section 01 60 00 - Product requirements.

**2.05 FORMWORK ACCESSORIES**

- A. Form Ties: Removable type, galvanized metal, fixed length, cone type, with waterproofing washer, free of defects that could leave holes larger than 1 inch in concrete surface.
- B. Form Release Agent: Capable of releasing forms from hardened concrete without staining or discoloring concrete or forming bugholes and other surface defects, compatible with concrete and form materials, and not requiring removal for satisfactory bonding of coatings to be applied.
- C. Nails, Spikes, Lag Bolts, Through Bolts, Anchorages: Sized as required, of sufficient strength and character to maintain formwork in place while placing concrete.
- D. Embedded Anchor Shapes, Plates, Angles and Bars: As specified in Section 05 12 00.

**PART 3 EXECUTION**

**3.01 EXAMINATION**

- A. Verify lines, levels and centers before proceeding with formwork. Ensure that dimensions agree with drawings.

**3.02 EARTH FORMS**

- A. Earth forms are not permitted.

**3.03 ERECTION - FORMWORK**

- A. Erect formwork, shoring and bracing to achieve design requirements, in accordance with requirements of ACI 301.
- B. Provide bracing to ensure stability of formwork. Shore or strengthen formwork subject to overstressing by construction loads.
- C. Arrange and assemble formwork to permit dismantling and stripping. Do not damage concrete during stripping. Permit removal of remaining principal shores.
- D. Align joints and make watertight. Keep form joints to a minimum.

- E. Obtain approval before framing openings in structural members that are not indicated on drawings.
- F. Provide fillet strips on exposed external corners of exposed walls.
- G. Install permanent compressible form materials in accordance with manufacturer's recommendations. Protect forms from moisture or crushing.
- H. Coordinate this section with other sections of work that require attachment of components to formwork.
- I. If formwork is placed after reinforcement, resulting in insufficient concrete cover over reinforcement, request instructions from Architect before proceeding.

**3.04 APPLICATION - FORM RELEASE AGENT**

- A. Apply form release agent on formwork in accordance with manufacturer's recommendations.
- B. Apply prior to placement of reinforcing steel, anchoring devices, and embedded items.
- C. Do not apply form release agent where concrete surfaces will receive applied coverings that are affected by agent. Soak inside surfaces of untreated forms with clean water. Keep surfaces coated prior to placement of concrete.

**3.05 INSERTS, EMBEDDED PARTS, AND OPENINGS**

- A. Provide formed openings where required for items to be embedded in passing through concrete work.
- B. Locate and set in place items that will be cast directly into concrete.
- C. Coordinate with work of other sections in forming and placing openings, slots, reglets, recesses, sleeves, bolts, anchors, other inserts, and components of other work.
- D. Install accessories in accordance with manufacturer's instructions, so they are straight, level, and plumb. Ensure items are not disturbed during concrete placement.
- E. Close temporary openings with tight fitting panels, flush with inside face of forms, and neatly fitted so joints will not be apparent in exposed concrete surfaces.

**3.06 FORM CLEANING**

- A. Clean forms as erection proceeds, to remove foreign matter within forms.
- B. Clean formed cavities of debris prior to placing concrete.
  - 1. Flush with water or use compressed air to remove remaining foreign matter. Ensure that water and debris drain to exterior through clean-out ports.
  - 2. During cold weather, remove ice and snow from within forms. Do not use de-icing salts. Do not use water to clean out forms, unless formwork and concrete construction proceed within heated enclosure. Use compressed air or other means to remove foreign matter.

**3.07 FORMWORK TOLERANCES**

- A. Construct formwork to maintain tolerances required by ACI 117, unless otherwise indicated.

**3.08 FIELD QUALITY CONTROL**

- A. An independent testing agency will perform field quality control tests, as specified in Section 01 40 00.
- B. Inspect erected formwork, shoring, and bracing to ensure that work is in accordance with formwork design, and to verify that supports, fastenings, wedges, ties, and items are secure.
- C. Do not reuse wood formwork more than three times for concrete surfaces to be exposed to view. Do not patch formwork.

**3.09 FORM REMOVAL**

- A. Do not remove forms or bracing until concrete has gained sufficient strength to carry its own weight and imposed loads.
- B. Loosen forms carefully. Do not wedge pry bars, hammers, or tools against finish concrete surfaces scheduled for exposure to view.
- C. Store removed forms to prevent damage to form materials or to fresh concrete. Discard damaged forms.

**END OF SECTION**

**CONCRETE REINFORCING****PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Reinforcing steel for cast-in-place concrete.
- B. Supports and accessories for steel reinforcement.

**1.02 RELATED REQUIREMENTS**

- A. Section 01 40 00 - Quality Requirements: Testing and Inspection Agency.
- B. Section 03 10 00 - Concrete Forming and Accessories.
- C. Section 03 30 00 - Cast-in-Place Concrete.
- D. Section 04 20 00 - Unit Masonry: Reinforcement for brick masonry.
- E. Section 04 27 31 - Reinforced Unit Masonry: Reinforcement for engineered masonry.
- F. Section 26 05 26 - Grounding and Bonding for Electrical Systems: Grounding connection to concrete reinforcement.
- G. Section 31 62 16.19 - Driven Steel Piles.

**1.03 REFERENCE STANDARDS**

- A. ACI 301 - Specifications for Structural Concrete for Buildings; American Concrete Institute International; 2010.
- B. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement; 2014.
- C. ASTM A1064/A1064M - Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete; 2013.
- D. AWS D1.4/D1.4M - Structural Welding Code - Reinforcing Steel; American Welding Society; 2011.
- E. CRSI (DA4) - Manual of Standard Practice; Concrete Reinforcing Steel Institute; 2009.

**1.04 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Steel Reinforcement Shop Drawings: Placing drawings that detail fabrication, bending, and placement. Include bar sizes, lengths, material, grade, bar schedules, stirrup spacing, bent bar diagrams, bar arrangement, splices and laps, mechanical connections, tie spacing, hoop spacing, and supports for concrete reinforcement. The steel reinforcement detailer shall generate all shop drawing bending and installation details from the structural and architectural drawings and specifications. The use of reproductions or photocopies of the contract drawings shall not be permitted.
  - 1. Provide details of fabrication, bending, and placement, prepared according to ACI 315, "Details and Detailing of Concrete Reinforcement." Include special reinforcement required for openings through concrete structures.
  - 2. Shop drawing re-submittals shall clearly identify all revisions to previous submittals.
    - a. Heavy ink clouded outlines (revision clouds) shall be drawn around revised areas of individual sheets.
    - b. Architect/Engineer will not review information outside of revision clouds on resubmitted drawings.
- C. Manufacturer's Certificate: Certify that reinforcing steel and accessories supplied for this project meet or exceed specified requirements.

**1.05 QUALITY ASSURANCE**

- A. Perform work of this section in accordance with ACI 301.
  - 1. Maintain one copy of each document on project site.
- B. Welders' Certificates: Submit certifications for welders employed on the project, verifying AWS qualification within the previous 12 months.

**PART 2 PRODUCTS**

**2.01 REINFORCEMENT**

- A. Reinforcing Steel: ASTM A615/A615M Grade 60 - 60,000 psi.
  - 1. Deformed billet-steel bars.
  - 2. Unfinished.
- B. Steel Welded Wire Reinforcement (WWR): Galvanized, deformed type; ASTM A1064/A1064M.
  - 1. Form: Flat Sheets.
  - 2. Mesh Size and Wire Gage: As indicated on drawings.
- C. Reinforcement Accessories:
  - 1. Tie Wire: Annealed, minimum 16 gage, 0.0508 inch.
  - 2. Chairs, Bolsters, Bar Supports, Spacers: Sized and shaped for adequate support of reinforcement during concrete placement.
  - 3. Provide stainless steel components for placement within 1-1/2 inches of weathering surfaces.
- D. Epoxy Adhesive: Two component epoxy.
  - 1. Reference General Structural Notes on Drawings.
  - 2. Substitutions: See Section 01 60 00 - Product Requirements.

**2.02 FABRICATION**

- A. Fabricate concrete reinforcing in accordance with CRSI (DA4) - Manual of Standard Practice.
- B. Welding of reinforcement is permitted only with the specific approval of Architect. Perform welding in accordance with AWS D1.4/D1.4M.
- C. Locate reinforcing splices not indicated on drawings at point of minimum stress.
  - 1. Review locations of splices with Architect.

**PART 3 EXECUTION**

**3.01 PLACEMENT**

- A. Place, support and secure reinforcement against displacement. Do not deviate from required position.
- B. Do not displace or damage vapor barrier.
- C. Accommodate placement of formed openings.
- D. Maintain concrete cover around reinforcing as indicated in General Structural Notes on Drawings.
  - 1. Reference General Structural Notes.
- E. Support and secure against displacement by formwork construction or concrete placement. Support with chairs, runners, bolsters, spacers, and hangers as required.
- F. Install welded wire fabric in large pieces as practical. Lap adjoining pieces at least two full mesh. Offset end laps in adjacent widths to prevent continuous laps in either direction.
- G. Provide standard reinforcement splices by lapping ends, placing bars in contact and tightly wiring and tying. Comply with requirements of General Structural Notes as indicated on Drawings for minimum lap of spliced bars, except as indicated otherwise.

- H. Lap masonry reinforcement to comply with requirements of General Structural Note as indicated on Drawings. Fully embed in mortar.
- I. Install rebar with epoxy adhesive as indicated on Drawings. Follow manufacturer's published instruction for preparation, mixing and placement of epoxy adhesive. Coordinate special inspection requirements.
- J. Bond and ground all reinforcement to requirements of Section 26 05 26.

**3.02 SPECIAL REINFORCEMENT**

- A. Wall Openings: Reference General Structural Notes on Drawings.
- B. Slab Re-Entrant Corners: Provide one each, 48 inch long, No. 5 bar diagonally across corner.

**3.03 FIELD QUALITY CONTROL**

- A. An independent testing agency, as specified in Section 01 40 00, will inspect installed reinforcement for conformance to contract documents before concrete placement.

**END OF SECTION**

**CAST-IN-PLACE CONCRETE****PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Concrete for composite floor construction.
- B. Elevated concrete slabs.
- C. Floors and slabs on grade.
- D. Concrete elevator shaft walls and foundation walls.
- E. Joint devices associated with concrete work.
- F. Miscellaneous concrete elements, including equipment pads, light pole bases, flagpole bases, thrust blocks, and manholes.
- G. Concrete curing.
- H. Underslab vapor barrier.
- I. Protection of slabs to receive special finishes.

**1.02 RELATED REQUIREMENTS**

- A. Section 01 40 00 - Quality Requirements: Testing and Inspection Agency.
- B. Section 03 10 00 - Concrete Forming and Accessories: Forms and accessories for formwork.
- C. Section 03 20 00 - Concrete Reinforcing.
- D. Section 03 35 20 - Polished Concrete Finishing.
- E. Section 07 90 05 - Joint Sealers: Sealants for saw cut joints and isolation joints in slabs.
- F. Section 32 13 13 - Concrete Paving: Sidewalks, curbs and gutters.

**1.03 REFERENCE STANDARDS**

- A. ACI 211.1 - Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete; American Concrete Institute International; 1991 (Reapproved 2002).
- B. ACI 301 - Specifications for Structural Concrete; American Concrete Institute International; 2010.
- C. ACI 302.1R - Guide for Concrete Floor and Slab Construction; American Concrete Institute International; 2004 (Errata 2007).
- D. ACI 304R - Guide for Measuring, Mixing, Transporting, and Placing Concrete; American Concrete Institute International; 2000.
- E. ACI 305R - Hot Weather Concreting; American Concrete Institute International; 2010.
- F. ACI 306R - Cold Weather Concreting; American Concrete Institute International; 2010.
- G. ACI 308R - Guide to Curing Concrete; American Concrete Institute International; 2001 (Reapproved 2008).
- H. ACI 318 - Building Code Requirements for Structural Concrete and Commentary; American Concrete Institute International; 2011.
- I. ASTM C33/C33M - Standard Specification for Concrete Aggregates; 2013.
- J. ASTM C39/C39M - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens; 2014.
- K. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete; 2014.

- L. ASTM C109/C109M - Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-in. or (50-mm) Cube Specimens); 2013.
- M. ASTM C143/C143M - Standard Test Method for Slump of Hydraulic-Cement Concrete; 2012.
- N. ASTM C150/C150M - Standard Specification for Portland Cement; 2012.
- O. ASTM C260/C260M - Standard Specification for Air-Entraining Admixtures for Concrete; 2010a.
- P. ASTM C309 - Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete; 2011.
- Q. ASTM C494/C494M - Standard Specification for Chemical Admixtures for Concrete; 2013.
- R. ASTM C618 - Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete; 2012.
- S. ASTM C881/C881M - Standard Specification for Epoxy-Resin-Base Bonding Systems for Concrete; 2013.
- T. ASTM C1059/C1059M - Standard Specification for Latex Agents for Bonding Fresh to Hardened Concrete; 2013.
- U. ASTM C1240 - Standard Specification for Silica Fume Used in Cementitious Mixtures; 2012.
- V. ASTM C1315 - Standard Specification for Liquid Membrane-Forming Compounds Having Special Properties for Curing and Sealing Concrete; 2011.
- W. ASTM D1751 - Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types); 2004 (Reapproved 2013).
- X. ASTM E1155 - Standard Test Method for Determining F(F) Floor Flatness and F(L) Floor Levelness Numbers; 1996 (Reapproved 2008).
- Y. ASTM E1745 - Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs; 2011.

#### **1.04 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Submit manufacturers' data on manufactured products showing compliance with specified requirements and installation instructions.
- C. Design Mixtures: For each concrete mixture. Submit alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.
  1. Indicate amounts of mixing water to be withheld for later addition at Project site.
  2. Include substantiating substantial test data to show compliance with ACI 318 Chapter 5.
  3. Include aggregate grading curve for concrete mixes at exposed floor finishing per Section 03 35 20 - Polished Concrete Finishing.
- D. Concrete Mix Design Data: For each strength with history.
- E. Floor Joint Layout Drawings: Submit layout drawings for all joints, coordinate with joints in finishes.
- F. Samples: Submit samples of underslab vapor retarder to be used.
- G. Manufacturer's Installation Instructions: For concrete accessories, indicate installation procedures and interface required with adjacent construction.
- H. Project Record Documents: Accurately record actual locations of embedded utilities and components that will be concealed from view upon completion of concrete work.



**1.05 QUALITY ASSURANCE**

- A. Perform work of this section in accordance with ACI 301 and ACI 318.
  - 1. Maintain one copy of each document on site.
- B. Follow recommendations of ACI 305R when concreting during hot weather.
- C. Follow recommendations of ACI 306R when concreting during cold weather.
- D. Independent Testing, performed by Contractor's testing service to determine if field conditions meet or exceed all flooring manufacturer's requirements for installation and warranty:
  - 1. MVER - ASTM F 1869-04, "Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride"
  - 2. RH - ASTM F-2170-09, "Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes"
  - 3. PH - ASTM F 710, "Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring"
- E. Weather conditions - no pours when temperature is above 90 or below 40 degrees. Wind conditions not to exceed 10 mph.

**1.06 MOCK-UP**

- A. Construct and erect mock-up panel for architectural concrete surfaces indicated to receive special treatment or finish as result of formwork.
  - 1. Panel Size: Sufficient to illustrate full range of treatment.
  - 2. Locate where directed.
- B. Accepted mock-up panel is considered basis of quality for the finished work. Keep mock-up exposed to view for duration of concrete work.
- C. Mock-up may remain as part of the Work.

**PART 2 PRODUCTS****2.01 FORMWORK**

- A. Comply with requirements of Section 03 10 00.

**2.02 REINFORCEMENT**

- A. Comply with requirements of Section 03 20 00.

**2.03 CONCRETE MATERIALS**

- A. Cement: ASTM C 150, Type I - Normal and Type II - Moderate Portland type.
  - 1. Acquire all cement for entire project from same source.
- B. Fine and Coarse Aggregates: ASTM C 33.
  - 1. Acquire all aggregates for entire project from same source.
  - 2. Maximum Coarse-Aggregate Size: 1 inch, 3/4" at topping on metal deck.
    - a. Aggregate at high tolerance concrete floors shall be well rounded, continuously graded aggregate.
- C. Fly Ash: ASTM C618, Class C or F.
- D. Silica Fume: ASTM C1240, proportioned in accordance with ACI 211.1.
- E. Waterproofing Additive: Crystalline waterproofing intended for mixing into concrete to close concrete pores by growth of crystals, with no decrease in concrete strength or chemical resistance.
- F. Water: Clean and not detrimental to concrete.

**2.04 ADMIXTURES**

- A. Do not use chemicals that will result in soluble chloride ions in excess of 0.1 percent by weight of cement.
- B. Air Entrainment Admixture: ASTM C260/C260M.
- C. High Range Water Reducing and Retarding Admixture: ASTM C494/C494M Type G.
- D. High Range Water Reducing Admixture: ASTM C494/C494M Type F.
- E. Water Reducing and Accelerating Admixture: ASTM C494/C494M Type E.
- F. Water Reducing and Retarding Admixture: ASTM C494/C494M Type D.
- G. Accelerating Admixture: ASTM C494/C494M Type C.
- H. Retarding Admixture: ASTM C494/C494M Type B.
- I. Water Reducing Admixture: ASTM C494/C494M Type A.
- J. Shrinkage Reducing Admixture:
  - 1. Acceptable Products:
    - 2. a. Eclipse Floor 200 by Grace Construction Products: [www.na.graceconstruction.com](http://www.na.graceconstruction.com).
    - 3. b. Substitutions: See Section 01 60 00 - Product Requirements.

**2.05 ACCESSORY MATERIALS**

- A. Underslab Vapor Retarder: Multi-layer, fabric-, cord-, grid-, or aluminum-reinforced polyethylene or equivalent, complying with ASTM E1745, Class A; stated by manufacturer as suitable for installation in contact with soil or granular fill under concrete slabs. The use of single ply polyethylene is prohibited.
  - 1. Accessory Products: Vapor retarder manufacturer's recommended tape, adhesive, mastic, prefabricated boots, etc., for sealing seams and penetrations in vapor retarder.
  - 2. Permeance: 0.005 perms, maximum.
  - 3. Puncture Resistance: 7 pound-force, minimum, when tested in accordance with ASTM D1709/D1709M.
  - 4. Products:
    - a. Insulation Solutions, Inc; Viper VaporCheck II 15-mil (Class A): [www.insulationsolutions.com](http://www.insulationsolutions.com).
    - b. Stego Industries, LLC; Stego Wrap Vapor Barrier 15-mil (Class A): [www.stegoindustries.com](http://www.stegoindustries.com).
    - c. W.R. Meadows, Inc.; PERMINATOR Class A - 15 mils: [www.wrmeadows.com](http://www.wrmeadows.com).
    - d. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Non-Shrink Cementitious Grout: Premixed compound consisting of non-metallic aggregate, cement, water reducing and plasticizing agents.
  - 1. Minimum Compressive Strength at 4 Hours: 2,400 psi.
  - 2. Minimum Compressive Strength at 28 Days: 7,000 psi.
- C. Snap Tie Plugs: Preformed, non-shrink grout plugs to fill holes left by form ties; size to flush with wall surface; compatible permanent adhesive.

**2.06 BONDING AND JOINTING PRODUCTS**

- A. Bonding Agent: Neat Portland cement paste, mixed to a thick, brushable consistency.
- B. Latex Bonding Agent: Non-redispersible acrylic latex, complying with ASTM C1059/C1059M, Type II.
- C. Epoxy Bonding System:
  - 1. Complying with ASTM C881/C881M and of Type required for specific application.

- D. Slab Isolation Joint Filler: 1/2 inch thick, height equal to slab thickness, with removable top section that will form 1/2 inch deep sealant pocket after removal.
  - 1. Material: ASTM D1751, cellulose fiber.
- E. Slab Construction Joint Devices: Steel plate dowels, 1/4 inch x 4-1/2 inch, with plastic inserts.
  - 1. Plate Dowel by PNA Construction Technologies.
  - 2. Substitutions: See Section 01 60 00 - Product Requirements.

## 2.07 CURING MATERIALS

- A. Liquid Curing Compound: ASTM C1315 Type 1, Class A, ASTM C 309, Type 1 Class A penetration product with minimum 34% solids content.
  - 1. Products:
    - a. Creteseal CS 2000
    - b. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Polished Concrete Finishing: Curing Agent.
  - 1. Penetrating product. No product that would produce a bond breaking surface shall be applied.
  - 2. Protect slabs from soil contamination.
  - 3. Protect slabs from indentation and footprints during pour and curing.
- C. Evaporation Reducer: Liquid thin-film-forming compound that reduces rapid moisture loss caused by high temperature, low humidity, and high winds; intended for application immediately after concrete placement.
- D. Curing and Sealing Compound, Moisture Emission Reducing: Liquid, membrane-forming, clear sealer, for application to newly placed concrete; capable of providing adequate bond for flooring adhesives, initially and over the long term; with sufficient moisture vapor impermeability to prevent deterioration of flooring adhesives due to moisture emission.
  - 1. Use this product to cure and seal all slabs to receive adhesively applied flooring or roofing.
  - 2. Comply with ASTM C309 and ASTM C1315 Type I Class A.
  - 3. VOC Content: Less than 100 g/L.
  - 4. Solids Content: 25 percent, minimum.
- E. Moisture-Retaining Sheet: ASTM C171.
  - 1. Curing paper, regular.
  - 2. Polyethylene film, white opaque, minimum nominal thickness of 0.0040 in..
  - 3. White-burlap-polyethylene sheet, weighing not less than 10 oz/per linear yd, 40 inches wide.
- F. Water: Potable, not detrimental to concrete.

## 2.08 DENSIFIERS AND HARDENERS

- A. Liquid Densifier/Hardener: Penetrating chemical compound that reacts with concrete, filling the pores and dustproofing; for application to concrete after set.
  - 1. Composition: Sodium silicate.
  - 2. Products:
    - a. Dayton Superior Corporation ; Densifier J13 : [www.daytonsuperior.com](http://www.daytonsuperior.com).
    - b. L&M Construction Chemicals, Inc., a subsidiary of Laticrete International, Inc; SEAL HARD: [www.lmcc.com](http://www.lmcc.com).
    - c. Nox-Crete Products Group; Duro-Nox: [www.nox-crete.com](http://www.nox-crete.com).
    - d. SpecChem, LLC; SpecHard: [www.specchemllc.com](http://www.specchemllc.com).
    - e. Substitutions: See Section 01 60 00 - Product Requirements.

## 2.09 CONCRETE MIX DESIGN

- A. Proportioning Normal Weight Concrete: Comply with ACI 211.1 recommendations.
- B. Concrete Strength: Establish required average strength for each type of concrete on the basis of field experience or trial mixtures, as specified in ACI 301.

- C. Admixtures: Add acceptable admixtures as recommended in ACI 211.1 and at rates recommended or required by manufacturer.
  - 1. Concrete mix at Section 03 35 20 Polished Concrete Finishing to have Eclipse shrinkage reducing admixture at 1.0 gal/cubic yard.
- D. Use set retarding admixtures during hot weather only when approved by Architect.
- E. Use accelerating admixtures in cold weather only when approved by Architect. Use of admixtures will not relax cold weather placement requirements.
- F. Reference General Structural Notes on Drawings for additional requirements.

## **2.10 MIXING**

- A. Transit Mixers: Comply with ASTM C94/C94M.

## **2.11 POLISHED CONCRETE**

- A. Refer to Section 03 35 20 - Polished Concrete Finishing.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify lines, levels, and dimensions before proceeding with work of this section.

### **3.02 PREPARATION**

- A. Where new concrete is to be bonded to previously placed concrete, prepare existing surface by cleaning with steel brush and applying bonding agent in accordance with manufacturer's instructions.
  - 1. Use epoxy bonding system for bonding to damp surfaces, for structural load-bearing applications, and where curing under humid conditions is required.
  - 2. Use latex bonding agent only for non-load-bearing applications.
- B. Install vapor retarder under interior slabs on grade. Lap joints minimum 6 inches and seal watertight by taping edges and ends. Coordinate vapor retarder installation with installation of reinforcing specified in Section 03 2000. Repair damaged vapor retarder before concrete placement.

### **3.03 PLACING CONCRETE**

- A. Place concrete in accordance with ACI 304R.
- B. Place concrete for floor slabs in accordance with ACI 302.1R.
- C. Finish floors level and flat, unless otherwise indicated, within the tolerances specified below.

### **3.04 SLAB JOINTING**

- A. Locate joints as indicated on the drawings and approved joint layout submittals.
- B. Anchor joint fillers and devices to prevent movement during concrete placement.
- C. Isolation Joints: Use preformed joint filler with removable top section for joint sealant, total height equal to thickness of slab, set flush with top of slab.
- D. Place floor slabs in checkerboard or saw cut pattern on approved Floor Joint layout Plan.

### **3.05 FLOOR FLATNESS AND LEVELNESS TOLERANCES**

- A. Minimum F(F) Floor Flatness and F(L) Floor Levelness Values:
  - 1. Exposed to View and Foot Traffic: F(F) of 40; F(L) of 15.
  - 2. Under Thick-Bed Tile: F(F) of 20; F(L) of 15.
  - 3. Under Carpeting: F(F) of 25; F(L) of 20.
  - 4. Under Thin Resilient Flooring and Thinset Tile: F(F) of 35; F(L) of 25.

- B. Measure F(F) and F(L) in accordance with ASTM E1155, within 48 hours after slab installation; report both composite overall values and local values for each measured section.
- C. Correct the slab surface if composite overall value is less than specified and if local value is less than two-thirds of specified value or less than F(F) 13/F(L) 10.
- D. Correct defects by grinding or by removal and replacement of the defective work. Areas requiring corrective work will be identified. Re-measure corrected areas by the same process.

### 3.06 CONCRETE FINISHING

- A. Repair surface defects, including tie holes, immediately after removing formwork.
- B. Unexposed Form Finish: Rub down or chip off fins or other raised areas 1/4 inch or more in height.
- C. Exposed Form Finish: Rub down or chip off and smooth fins or other raised areas 1/4 inch or more in height. Provide finish as follows:
  1. Smooth Rubbed Finish: Wet concrete and rub with carborundum brick or other abrasive, not more than 24 hours after form removal.
  2. SCONC-2/Chemical Hardener: Apply hardener per manufacturer's instructions.
- D. Concrete Slabs: Finish to requirements of ACI 302.1R, and as follows:
  1. Surfaces to Receive Thick Floor Coverings: "Wood float" as described in ACI 302.1R; thick floor coverings include quarry tile, ceramic tile, and terrazzo with full bed setting system.
  2. Surfaces to Receive Thin Floor Coverings: "Steel trowel" as described in ACI 302.1R; thin floor coverings include carpeting, resilient flooring, seamless flooring, thin set quarry tile, thin set ceramic tile, and wood flooring system.
  3. Other Surfaces to Be Left Exposed: "Steel trowel" as described in ACI 302.1R, minimizing burnish marks and other appearance defects.
    - a. SCONC-1/Chemical Hardener: After slab has cured, apply hardener per manufacturer's instructions.
- E. In areas with floor drains, maintain floor elevation at walls; pitch surfaces uniformly to drains at 1:100 nominal.

### 3.07 CURING AND PROTECTION

- A. Comply with requirements of ACI 308R. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury.
- B. Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete.
- C. Surfaces Not in Contact with Forms:
  1. Initial Curing: Start as soon as free water has disappeared and before surface is dry. Keep continuously moist for not less than three days by water ponding, water-saturated sand, water-fog spray, or saturated burlap.
  2. Final Curing: Begin after initial curing but before surface is dry.
- D. Surfaces to Receive Polished Concrete Finish.
  1. Refer to Section 03 35 00 - Polished Concrete Finishing.
  2. Initial Curing: Start as soon as free water has disappeared and before surface is dry. Keep continuously moist for not less than seven days by water ponding, water-saturated sand, water-fog spray, or saturated burlap.
- E. Moisture Retaining Cover: Seal in place with waterproof tape or adhesive.

### 3.08 FIELD QUALITY CONTROL

- A. An independent testing agency will perform field quality control tests, as specified in Section 01 40 00.

- B. Provide free access to concrete operations at project site and cooperate with appointed firm.
- C. Submit proposed mix design of each class of concrete to inspection and testing firm for review prior to commencement of concrete operations.
- D. Tests of concrete and concrete materials may be performed at any time to ensure conformance with specified requirements.
- E. Compressive Strength Tests: ASTM C39/C39M. For each test, mold and cure three concrete test cylinders. Obtain test samples for every 100 cu yd or less of each class of concrete placed.
- F. Take one additional test cylinder during cold weather concreting, cured on job site under same conditions as concrete it represents.
- G. Perform one slump test for each set of test cylinders taken, following procedures of ASTM C143/C143M.

### **3.09 DEFECTIVE CONCRETE**

- A. Test Results: The testing agency shall report test results in writing to Architect and Contractor within 24 hours of test.
- B. Defective Concrete: Concrete not conforming to required lines, details, dimensions, tolerances or specified requirements.
- C. Repair or replacement of defective concrete will be determined by the Architect. The cost of additional testing shall be borne by Contractor when defective concrete is identified.
- D. Do not patch, fill, touch-up, repair, or replace exposed concrete except upon express direction of Architect for each individual area.

### **3.10 PROTECTION**

- A. Do not permit traffic over unprotected concrete floor surface until fully cured.
- B. Concrete to Receive Special Finishes: Protect concrete area where special finishes are specified at all times during construction to prevent oils, dirt, metal, excessive water and other potentially damaging materials from affecting the finished concrete surface. Protection measures listed below shall begin immediately after the concrete slab is poured.
  1. All hydraulic powered equipment shall be diapered to avoid staining of the concrete.
  2. All vehicle parking shall be prohibited on the finish slab area. If necessary to complete their scope of work, drop cloths shall be placed under vehicles at all times.
  3. No pipe cutting machine shall be used on the finish floor slab.
  4. Steel shall not be placed on finish slab to avoid rust staining.
  5. All equipment used on the finish slab shall be equipped with non-marking tires.

**END OF SECTION**

**POLISHED CONCRETE FINISHING****PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Sealer and hardener
- B. Grinding and polishing.
- C. Slip-resistant finish.

**1.02 RELATED SECTIONS**

- A. Section 03 30 00 - Cast-In-Place Concrete: Concrete material, installation and protection.
- B. Section 07 90 05 - Joint Sealers.

**1.03 REFERENCES**

- A. ASTM C779 - Standard Test Method for Abrasion Resistance of Horizontal Concrete Surfaces.
- B. ASTM C805 - Standard Test Method for Rebound Number of Hardened Concrete.
- C. ASTM E430 - Standard Test Methods for Measurement of Gloss of High-Gloss Surfaces by Abridged Goniophotometry; 2011.
- D. ASTM E1155 - Standard Test Method for Determining F(F) Floor Flatness and F(L) Floor Levelness Numbers; 1996 (Reapproved 2008).
- E. ASTM G23 - Practice for Operating Light-Exposure Apparatus (Carbon-Arc Type) With and Without Water for Exposure of Nonmetallic Materials (Withdrawn Standard)
- F. ACI 302 - Guide for Concrete Floor and Slab Construction.
- G. CCPA - Concrete Polishing Association of America.

**1.04 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide manufacturer's specifications and product data on materials.
- C. Samples: Submit three concrete samples, 12 x 12 inch in size, illustrating complete finish and sheen.
- D. Test Reports: Indicate compliance with specified performance requirements.
- E. Manufacturer's Instructions: Indicate complete preparation, installation procedures, and cure time.
- F. Maintenance Data: Routine and renewal maintenance recommendations.

**1.05 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than five years of documented experience.
- B. Installer Qualifications: Company specializing in performing the work of this section and approved by manufacturer, with not less than five years of documented experience.
- C. Perform work under direction of manufacturer's technical representative; representative to be at site while work is being performed.

**1.06 MOCK-UP**

- A. Provide two mock-ups, 6 feet long by 6 feet wide, illustrating the two aggregate exposures and complete polished finish.

- B. Locate where directed.
- C. Accepted mock-up may not remain as part of the Work.

#### **1.07 PRE-INSTALLATION MEETING**

- A. Convene one week before starting work of this section.
- B. Contractor shall coordinate the pre-installation conference with the following:
  1. Owner, Architect, Concrete Installer, Product Representative, polished concrete installer.
- C. Discussion items shall include:
  1. Moisture and humidity control
  2. Concrete moisture content, slump, admixtures, plasticizers, and other components that may affect performance of flooring adhesives.
  3. Moisture and vapor emissions testing.
  4. Floor flatness and levelness.
  5. Curing procedures
  6. Joints.
  7. Floor finish.
  8. Schedule.

#### **1.08 DELIVERY, STORAGE, AND PROTECTION**

- A. Deliver materials in manufacturer's sealed packaging, including application instructions.

#### **1.09 PROJECT CONDITIONS**

- A. Schedule concrete floor finishing to be completed prior to start of application of wall board or other finish wall and ceiling material.

#### **1.10 ENVIRONMENTAL REQUIREMENTS**

- A. Comply with floor finish manufacturer's written instructions.
- B. Maintain light level equivalent to minimum 200 Watt light source, placed 8 feet above the floor surface, for each 425 sq ft of floor being finished.
- C. Maintain ambient temperature of 50 degrees F minimum.
- D. Provide ventilation sufficient to prevent injurious gases from temporary heat or other sources during application.

### **PART 2 PRODUCTS**

#### **2.01 MANUFACTURERS**

- A. Basis of Design: Retro-Plate System by Advanced Floor Products, Inc:  
[www.retroplatesystem.com](http://www.retroplatesystem.com).
- B. Other Approved Manufactures:
  1. Lythic Solutions, Inc: [www.lythic.net](http://www.lythic.net).
  2. Substitutions: See Section 01 60 00 - Product Requirements.

#### **2.02 MATERIALS**

- A. Hardening / Sealing Agent: Retro-plate 99 by Advanced Floor Products, Inc
  1. Adhesion Resistance: Up to 400 percent per ASTM C 779.
  2. Impact Strength: Up to 21 percent per ASTM C 805.
  3. Ultraviolet Light and Water Spray: No adverse effect per ASTM G 23.
  4. Sheen: Semi-gloss.
- B. Water: Potable.
- C. Neutralizing Agent: Tri-sodium phosphate.



**PART 3 EXECUTION****3.01 INSTALLERS**

- A. Approved Installers:
  1. Sustainable Flooring Solutions; 360-571-5760.
  2. Lundeen Simonson Inc.; 509-484-7432.
  3. CRJ Construction Inc.; 206-762-3669.
  4. Substitutions: Refer to Section 01 60 00 - Product Requirements.

**3.02 EXAMINATION**

- A. Verify that substrate is acceptable without conditions that are detrimental to timely and proper installation of work of this Section.
- B. Verify that slab finish and surface profile complies with the following:
  1. Flatness Rating: Minimum 40.
  2. Levelness Rating: Minimum 20.
  3. Minimum concrete cure of 45 days or as directed by manufacturer.
- C. Verify that floor surfaces are free of latent defects.

**3.03 PROTECTION**

- A. Install temporary wall protection to prevent physical contact from polishing machines,
- B. Install 6-mil polyethylene barrier to 48" AFF at all walls prior to polishing operations.
- C. Use non-marking tired equipment on finish slabs.

**3.04 PREPARATION**

- A. Clean concrete surfaces as recommended by manufacturer.
- B. Remove lattice by manufacturer-approved grinding procedure. Grind entire area to one consistent appearance.
- C. Repairs are not acceptable unless specifically approved on a case-by-case basis by Architect. Repairs must be completed and cured prior to staining.

**3.05 INSTALLATION**

- A. Apply colorant, sealer, hardener and polish surfaces in accordance with manufacturer's instructions and under direction of manufacturer's technical representative.
- B. Finish Aggregate Exposure at Forum and Entry Lobby: Medium to larger aggregate exposure to match approved mock-up.
  1. Exposed Aggregate Area: CPAA Class C Medium Aggregate Exposure.
  2. Final Sheet: Level 2, 800 Diamond Finish (ASTM E430 - Level B Sheen - Medium Gloss).
- C. Finish Aggregate Exposure Except at Forum and Entry Lobby: Light to medium aggregate exposure to match approved mock-up.
  1. Exposed Aggregate Area: CPAA Class B Fine Aggregate Exposure.
  2. Final Sheen: Level 2, 800 Diamond Finish (ASTM E430 - Medium Gloss).
- D. Diamond Polish:
  1. Begin grinding as needed to expose aggregate.
  2. Continue grinding process as needed to refine visible scratch pattern.
  3. Blend edges with body of floor.
  4. Hand grind as necessary to keep grind consistent throughout each area.
  5. Begin resin polishing process using proper tooling to continue surface refinement and remove visible scratch patterns.
  6. Apply densifier to the floor as per manufacturer's instructions.

7. Complete polishing process to required grit to obtain a minimum average gloss reading of 55 to 60 (semi-gloss).
8. Apply protector product as specified per manufacturer's instructions.

E. Sealing, Hardening, and Polishing of Concrete Surface:

1. Apply to achieve waterproofing, hardening, dust-proofing, and abrasion resistance of the surface without changing the natural appearance of the concrete, except for the sheen.
2. Extend finish to within 1/2 inch of all vertical surfaces.
3. Polish to match approved mock-up.

**3.06 FIELD QUALITY CONTROL**

- A. Perform initial application under direction of Manufacturer's representative.
- B. Perform field inspection and testing in accordance with Section 01 40 00.

**3.07 CLEANING / PROTECTION**

- A. Clean finished floors as recommended by manufacturer.
- B. Protect finished concrete from subsequent construction operations.
- C. Do not permit traffic over unprotected floor surface.

**3.08 SCHEDULES**

- A. Apply polished concrete surfacing at the following locations:
  1. Interior exposed concrete floors.
  2. Interior concrete stair treads and landings.
  3. Interior precast concrete treads and risers.

**END OF SECTION**

**PRECAST ARCHITECTURAL CONCRETE**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Architectural precast concrete stair treads and risers.
- B. Architectural precast concrete wall panels at Vestibule and Lobby.
- C. Supports, anchors, and attachments.

**1.02 RELATED REQUIREMENTS**

- A. Section 01 62 11 - Delegated Design.
- B. Section 03 35 20 - Polished Concrete Finish: Finish at treads.
- C. Section 05 12 00 - Structural Steel Framing: Steel stair components.
- D. Section 05 51 00 - Metal Stairs: Stair system to accept precast treads and risers.
- E. Section 07 90 05 - Joint Sealers: Perimeter joints with sealant and backing.

**1.03 REFERENCE STANDARDS**

- A. ACI 318 - Building Code Requirements for Structural Concrete and Commentary; American Concrete Institute International; 2011.
- B. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon Steel Bars for Concrete Reinforcement; 2014.
- C. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2010.
- D. ASTM C33/C33M - Standard Specification for Concrete Aggregates; 2013.
- E. ASTM C150/C150M - Standard Specification for Portland Cement; 2012.
- F. ASTM C330/C330M - Standard Specification for Lightweight Aggregates for Structural Concrete; 2014.
- G. PCI MNL-116 - Manual for Quality Control for Plants and Production of Structural Precast Concrete Products; Precast/Prestressed Concrete Institute; 2007.
- H. PCI MNL-117 - Manual for Quality Control for Plants and Production of Architectural Precast Concrete Products; Precast/Prestressed Concrete Institute; 2007.
- I. PCI MNL-120 - PCI Design Handbook - Precast and Prestressed Concrete; Precast/Prestressed Concrete Institute; Seventh Edition, 2010.
- J. PCI MNL-122 - Architectural Precast Concrete; Precast/Prestressed Concrete Institute; 2007, Third Edition.
- K. PCI MNL-123 - Design and Typical Details of Connections for Precast and Prestressed Concrete; Precast/Prestressed Concrete Institute; 1988, Second Edition.
- L. PCI MNL-135 - Tolerance Manual for Precast and Prestressed Concrete Construction; Precast/Prestressed Concrete Institute; 2000.

**1.04 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Manufacturer's information on accessory products, including pigments, admixtures, inserts, plates, etc.

- C. Shop Drawings: Indicate layout, unit locations, configuration, unit identification marks, reinforcement, integral insulation, insulated panel system connectors, connection details, support items, location of lifting devices, dimensions, openings, and relationship to adjacent materials. Provide erection drawings.
  - 1. Include details of mix designs.
  - 2. Include structural design calculations.
- D. Delegated Design Data: As required by authorities having jurisdiction.
- E. Samples: Submit two samples, 12 x 12 inch in size, illustrating surface finish, color and texture.

**1.05 QUALITY ASSURANCE**

- A. Perform the work of this section in accordance with PCI MNL-116, PCI MNL-117, PCI MNL-120, PCI MNL-122, PCI MNL-123, PCI MNL-135, and ACI 318. Perform welding in accordance with AWS D1.1.
- B. Fabricator Qualifications:
  - 1. Firm having at least 2 years of documented experience in production of precast concrete of the type required.

**1.06 MOCK-UP**

- A. Provide one mockup of a precast stair tread and riser.
- B. Locate where directed.
- C. Accepted mock-up may remain as part of the Work.

**1.07 DELIVERY, STORAGE, AND HANDLING**

- A. Handling: Lift and support precast units only from support points.
- B. Protect units to prevent staining, chipping, or spalling of concrete.
- C. Mark units with date of production in location that will be concealed after installation.

**PART 2 PRODUCTS**

**2.01 PRECAST UNITS**

- A. Precast Architectural Concrete Units:
  - 1. Design Loads: Static loads, anticipated dynamic loading, including positive and negative wind loads, thermal movement loads, and erection forces as defined by applicable code and indicated on Structural Drawings.
  - 2. Calculate structural properties of units in accordance with ACI 318.
  - 3. Accommodate construction tolerances, deflection of building structural members, and clearances of intended openings.
  - 4. Provide connections that accommodate building movement and thermal movement and adjust to misalignment of structure without unit distortion or damage.
- B. Finish Type A: Ensure exposed-to-view finish surfaces of precast units are uniform in color and appearance.

**2.02 REINFORCEMENT**

- A. Reinforcing Steel: ASTM A615/A615M Grade 60 (420).
- B. Tensioning Steel Tendons: ASTM A 492 and A 240, Type 316 stainless steel prestressing tendons.

**2.03 CONCRETE MATERIALS**

- A. Cement: ASTM C150, Type I - Normal Portland type.

- B. Fine and Coarse Structural Aggregates: ASTM C33.
- C. Lightweight Structural Aggregate: ASTM C330.
- D. Water: Clean and not detrimental to concrete.

**2.04 SUPPORT DEVICES**

- A. Connecting and Support Devices; Anchors and Inserts: ASTM A666 Type 304 stainless steel.
  1. Clean surfaces of rust, scale, grease, and foreign matter.

**2.05 ACCESSORIES**

- A. Bearing Pads: High density plastic; Shore A Durometer 70; 1/8 inch thick, smooth both sides.

**2.06 MIX**

- A. Concrete: Minimum 5000 psi, 28 day strength, air entrained to 5 to 7 percent in accordance with ACI 301.

**2.07 FABRICATION**

- A. Fabricate in conformance with PCI MNL-116, PCI MNL-117 and PCI MNL-135.
- B. Treads, Landing, and Floors: Fabricate to thickness and sizes indicated on Drawings; divide into strips from larger pours.
- C. Tread Nosing: Provide slip-resistant grooves as indicated on Drawings.
- D. Wall Panels: Fabricate to sizes indicated on Drawings.
- E. Maintain plant records and quality control program during production of precast units. Make records available upon request.
- F. Use rigid molds, constructed to maintain precast unit uniform in shape, size, and finish.
- G. Maintain consistent quality during manufacture.
- H. Fabricate connecting devices, plates, angles, inserts, bolts, and accessories. Fabricate to permit initial placement and final attachment.
- I. Embed reinforcing steel, anchors, inserts plates, angles, and other cast-in items.
- J. Locate hoisting devices to permit removal after erection.
- K. Cure units to develop concrete quality, and to minimize appearance blemishes such as non-uniformity, staining, or surface cracking.
- L. Minor patching in plant is acceptable, providing structural adequacy and appearance of units is not impaired.

**2.08 FINISH - PRECAST UNITS**

- A. Finish: Ensure exposed-to-view finish surfaces of precast units are uniform in color and appearance acceptable to Section 03 35 20.

**2.09 FABRICATION TOLERANCES**

- A. Conform to PCI MNL-117 and PCI MNL-135, except as specifically amended below.
  1. Maximum Variation From Nominal Face Dimensions: Plus or minus 1/8 in.
  2. Maximum Variation From Square or Designated Skew: Plus or minus 1/8 inch in 10 feet.
  3. Maximum Variation from Thickness: Plus or minus 1/8 in.
  4. Maximum Misalignment of Anchors, Inserts, Openings: Plus or minus 1/8 inch.
  5. Maximum Bowing of Members: Plus or minus length/360.

**2.10 SOURCE QUALITY CONTROL**

- A. Section 01 40 00 - Quality Requirements: Provide mix design for concrete.
- B. Test samples in accordance with applicable ASTM standard.

**PART 3 EXECUTION**

**3.01 EXAMINATION**

- A. Verify that building structure, anchors, devices, and openings are ready to receive work of this section.

**3.02 PREPARATION**

- A. Provide for erection procedures and induced loads during erection. Maintain temporary bracing in place until final support is provided.

**3.03 ERECTION**

- A. Erect units without damage to shape or finish. Replace or repair damaged panels.
- B. Erect units level and plumb within allowable tolerances.
- C. Align and maintain uniform horizontal and vertical joints as erection progresses.
- D. When units require adjustment beyond design or tolerance criteria, discontinue affected work; advise Architect.
- E. Fasten units in place with mechanical connections.
- F. Set vertical units dry, without grout, attaining joint dimension with lead or plastic spacers.
- G. Seal perimeter and intermediate joints in accordance with Section 07 90 05.

**3.04 TOLERANCES**

- A. Erect members level and plumb within allowable tolerances. Conform to PCI MNL-135, except as specifically amended below.
  - 1. Plan Location from Building Grid Datum: Plus or minus 3/8 in.
  - 2. Top Elevation from Nominal Top Elevation: Plus or minus 1/8 inch.
  - 3. Maximum Plumb Variation Over Height of Structure or 100 ft (whichever is less): Plus or minus 1/2 inch.
  - 4. Exposed Joint Dimension: Plus or minus 3/16 inch.
  - 5. Maximum Jog in Alignment of Matching Faces or Edges: Plus or minus 3/16 inch.

**END OF SECTION**

**MASONRY VENEER****PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Clay Facing Brick.
- B. Mortar .
- C. Reinforcement and Anchorage.
- D. Flashing.
- E. Installation of Lintels.
- F. Accessories.

**1.02 RELATED REQUIREMENTS**

- A. Section 01 40 00 - Quality Requirements: Testing and Inspection Agency.
- B. Section 04 27 31 - Reinforced Unit Masonry.
- C. Section 05 50 00 - Metal Fabrications: Loose steel lintels.
- D. Section 09 99 00 - Painting and Coating: Brick masonry sealer.

**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 A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2009.
- C. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2010.
- D. ASTM C144 - Standard Specification for Aggregate for Masonry Mortar; 2011.
- E. ASTM C150/C150M - Standard Specification for Portland Cement; 2012.
- F. ASTM C207 - Standard Specification for Hydrated Lime for Masonry Purposes; 2006 (Reapproved 2011).
- G. ASTM C216 - Standard Specification for Facing Brick (Solid Masonry Units Made From Clay or Shale); 2014.
- H. ASTM C270 - Standard Specification for Mortar for Unit Masonry; 2012.
- I. ASTM C404 - Standard Specification for Aggregates for Masonry Grout; 2011.
- J. ASTM C979/C979M - Standard Specification for Pigments for Integrally Colored Concrete; 2010.

**1.04 ADMINISTRATIVE REQUIREMENTS**

- A. Preinstallation Meeting: Convene one week before starting work of this section.

**1.05 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data for masonry units and mortar.
- C. Samples: Submit four samples of facing brick units to illustrate color, texture, and extremes of color range.
- D. Manufacturer's Certificate: Certify that masonry units meet or exceed specified requirements.

**1.06 QUALITY ASSURANCE**

- A. Comply with provisions of ACI 530/530.1/ERTA, except where exceeded by requirements of the contract documents.

**1.07 MOCK-UP**

- A. Construct a masonry wall as a mock-up panel sized 8 feet long by 6 feet high; include mortar and accessories and structural backup in mock-up.
- B. Locate where directed.
- C. Mock-up may remain as part of the Work.

**1.08 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver, handle, and store masonry units by means that will prevent mechanical damage and contamination by other materials.
- B. Handle and store ceramic glazed masonry units in protective cartons or trays. Do not remove from protective packaging until ready for installation.

**1.09 FIELD CONDITIONS**

- A. Maintain materials and surrounding air temperature to minimum 40 degrees F prior to, during, and 48 hours after completion of masonry work.
- B. Maintain materials and surrounding air temperature to maximum 90 degrees F prior to, during, and 48 hours after completion of masonry work.

**PART 2 PRODUCTS**

**2.01 BRICK UNITS**

- A. Facing Brick: ASTM C216, Type FBS, Grade SW.
  - 1. Color: Mix of 28% Forest Blend, 15% Ebony, 32% Coal Creek, and 25% Manua Loa by Mutual Materials.
  - 2. Actual size: 2-1/4 x 11-5/8 x 3-5/8 inch.
  - 3. Special shapes: Molded units as required by conditions indicated, unless standard units can be sawn to produce equivalent effect, including:
    - a. 8 inch x 8 inch corner unit to achieve Modified 1/3 Running Bond at corners.
    - b. Structural core where indicated on Drawings.

**2.02 MORTAR MATERIALS**

- A. Portland Cement: ASTM C150/C150M, Type I; color as required to produce approved color sample.
- B. Hydrated Lime: ASTM C207, Type S.
- C. Mortar Aggregate: ASTM C144.
- D. Grout Aggregate: ASTM C404.
- E. Pigments for Colored Mortar: Pure, concentrated mineral pigments specifically intended for mixing into mortar and complying with ASTM C979/C979M.
  - 1. Color(s): As selected by Architect from manufacturer's full range.
  - 2. Manufacturers:
    - a. Davis Colors: [www.daviscolors.com](http://www.daviscolors.com).
    - b. Lambert Corporation: [www.lambertusa.com](http://www.lambertusa.com).
    - c. Solomon Colors: [www.solomoncolors.com](http://www.solomoncolors.com).
- F. Water: Clean and potable.
- G. Accelerating Admixture: Nonchloride type for use in cold weather.



- H. Moisture-Resistant Admixture: Water repellent compound designed to reduce capillarity.

**2.03 REINFORCEMENT AND ANCHORAGE**

- A. Masonry Veneer Anchors: 2-piece anchors that permit differential movement between masonry veneer and structural backup, hot dip galvanized to ASTM A 153/A 153M, Class B.
  - 1. Anchor plates: Not less than 0.105 inch thick, designed for fastening to structural backup through sheathing by two fasteners; provide design with legs that penetrate sheathing and insulation to provide positive anchorage.
  - 2. Vertical adjustment: Not less than 1-1/4 inches.
  - 3. Pintle: 11 gage.
  - 4. Continuous Wire Reinforcement: 9 gage.
  - 5. Fasteners: Galvanized steel; type as recommended by manufacturer to suit application.
  - 6. Seismic Feature: Provide lip, hook, or clip on end of wire ties to engage or enclose not less than one continuous horizontal joint reinforcement wire of 0.1483 inch diameter.
  - 7. Manufacturers:
    - a. Model HB-213 with Seismicclip Interlock System by Hohmann & Barnard, Inc: [www.h-b.com](http://www.h-b.com).
    - b. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Metal-to-Metal Fasteners: Self-drilling, self-tapping screws; corrosion resistant finish or hot dip galvanized to ASTM A153/A153M.

**2.04 FLASHING**

- A. Stainless Steel: ASTM A666, Type 304, soft temper; 26 gage, 0.0187 inch thick; finish 2B to 2D.

**2.05 ACCESSORIES**

- A. Preformed Control Joints: Closed cell polyvinyl chloride, polyethylene, polyurethane, or rubber material. Oversized 50 percent to joint width; self-expanding; 3 inch wide x maximum lengths. Provide with corner and tee accessories, fused joints.
- B. Cavity Vents / Weeps: Cell vent weep, preformed plastic, size and shape to fit mortar joint.
  - 1. Manufacturers:
    - a. CavClear Weep Vents by CavClear/Archovations, Inc: [www.cavclear.com](http://www.cavclear.com).
    - b. Cell Vent Weep by Dur-O-Wal: [www.dur-o-wal.com](http://www.dur-o-wal.com).
    - c. No. 85 Cell Vent by Heckmann Building Products: [www.heckmannbuildingprods.com](http://www.heckmannbuildingprods.com).
    - d. Quadro-Vent by Hohmann & Bernard, Inc: [www.h-b.com](http://www.h-b.com).
    - e. Mortar Maze Cell Vents by Advanced Building Products Inc: [www.advancedflashing.com](http://www.advancedflashing.com).
    - f. Substitutions: See Section 01 60 00 - Product Requirements.
- C. Cavity Mortar Diverter: Semi-rigid polyethylene or polyester mesh blocks, sized to fill bottom of wall cavity and suspend mortar droppings above weep/cavity vents to allow cavity drainage. ; nominal 10 inch height.
  - 1. CavClear Masonry Mat by Archovations, Inc.: [www.cavclear.com](http://www.cavclear.com)
  - 2. Mortar Net by Mortar Net USA, Ltd: [www.mortarnet.com](http://www.mortarnet.com).
  - 3. Mortar Break II by Advanced Building Products Inc: [www.advancedflashing.com](http://www.advancedflashing.com).
  - 4. Substitutions: See Section 01 60 00 - Product Requirements.
- D. Cleaning Solution: Non-acidic, not harmful to masonry work or adjacent materials.

**2.06 MORTAR MIXES**

- A. Mortar for Unit Masonry: ASTM C270, Proportion Specification.
  - 1. Masonry below grade and in contact with earth: Type S.
  - 2. Exterior, non-loadbearing masonry: Type S.
- B. Colored Mortar: Proportion selected pigments and other ingredients to match Architect's sample, without exceeding manufacturer's recommended pigment-to-cement ratio.

**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 COURSING**

- A. Establish lines, levels, and coursing indicated. Protect from displacement.
- B. Maintain masonry courses to uniform dimension. Form vertical and horizontal joints of uniform thickness.
- C. Brick Units:
  1. Bond: 1/3 Running Bond.
  2. Coursing: Three units and three mortar joints to equal 8 inches.
  3. Mortar Joints: Concave.

**3.03 PLACING AND BONDING**

- A. Lay solid masonry units in full bed of mortar, with full head joints, uniformly jointed with other work.
- B. Buttering corners of joints or excessive furrowing of mortar joints is not permitted.
- C. Remove excess mortar as work progresses.
- D. Interlock intersections and external corners.
- E. Do not shift or tap masonry units after mortar has achieved initial set. Where adjustment must be made, remove mortar and replace.
- F. Perform job site cutting of masonry units with proper tools to provide straight, clean, unchipped edges. Prevent broken masonry unit corners or edges.
- G. Isolate top joint of masonry veneer from horizontal structural framing members or support angles with compressible joint filler.

**3.04 WEEPS/CAVITY VENTS**

- A. Install weeps in veneer walls at 24 inches on center horizontally above through-wall flashing, above shelf angles and lintels, and at bottom of walls.

**3.05 CAVITY MORTAR CONTROL**

- A. Do not permit mortar to drop or accumulate into cavity air space or to plug weep/cavity vents.
- B. For cavity walls, build inner wythe ahead of outer wythe to accommodate accessories.

**3.06 REINFORCEMENT AND ANCHORAGE - MASONRY VENEER**

- A. Masonry Back-Up: Embed anchors to bond veneer at maximum 16 inches on center vertically and 18 inches on center horizontally or one anchor for every 2.0 sf of wall area. Place additional anchors at perimeter of openings and ends of panels, so maximum spacing of anchors is 8 inches on center.
- B. Stud Back-Up: Secure veneer anchors to stud framed back-up and embed into masonry veneer at maximum 18 inches on center vertically and 16 inches on center horizontally or one anchor for every 2.0 sf of wall area. Place additional anchors at perimeter of openings and ends of panels, so maximum spacing of anchors is 8 inches on center.
- C. Seismic Reinforcement: Connect veneer anchors with continuous horizontal wire reinforcement before embedding anchors in mortar.

**3.07 MASONRY FLASHINGS**

- A. Whether or not specifically indicated, install masonry flashing to divert water to exterior at all locations where downward flow of water will be interrupted.
  - 1. Extend flashings full width at such interruptions and at least 4 inches into adjacent masonry or turn up at least 4 inches to form watertight pan at non-masonry construction.
  - 2. Remove or cover protrusions or sharp edges that could puncture flashings.
  - 3. Seal lapped ends and penetrations of flashing before covering with mortar.
- B. Extend metal flashings through exterior face of masonry and turn down to form drip.
- C. Lap end joints of flashings at least 4 inches and seal watertight with mastic or elastic sealant.

**3.08 LINTELS**

- A. Install loose steel lintels over openings.
- B. Maintain minimum 6 inch bearing on each side of opening.

**3.09 CONTROL AND EXPANSION JOINTS**

- A. Do not continue horizontal joint reinforcement through control and expansion joints.
- B. Install preformed control joint device in continuous lengths. Seal butt and corner joints in accordance with manufacturer's instructions.
- C. Form expansion joint as detailed.

**3.10 TOLERANCES**

- A. Maximum Variation From Unit to Adjacent Unit: 1/16 inch.
- B. Maximum Variation from Plane of Wall: 1/4 inch in 10 ft and 1/2 inch in 20 ft or more.
- C. Maximum Variation from Plumb: 1/4 inch per story non-cumulative; 1/2 inch in two stories or more.
- D. Maximum Variation from Level Coursing: 1/8 inch in 3 ft and 1/4 inch in 10 ft; 1/2 inch in 30 ft.
- E. Maximum Variation of Mortar Joint Thickness: Head joint, minus 1/4 inch, plus 3/8 inch.

**3.11 CUTTING AND FITTING**

- A. Cut and fit for pipes and conduit. 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.

**3.12 FIELD QUALITY CONTROL**

- A. An independent testing agency will perform quality control tests, as specified in Section 01 4000.
- B. Special Inspection of reinforcing and ties as required by Code.

**3.13 CLEANING**

- A. Remove excess mortar and mortar smears as work progresses.
- B. Replace defective mortar. Match adjacent work.
- C. Clean soiled surfaces with cleaning solution.
- D. Use non-metallic tools in cleaning operations.

**3.14 PROTECTION**

- A. Without damaging completed work, provide protective boards at exposed external corners that are subject to damage by construction activities.

**END OF SECTION**

**REINFORCED UNIT MASONRY**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Concrete Block.
- B. Mortar and Grout.
- C. Reinforcement and Anchorage.
- D. Accessories.

**1.02 RELATED REQUIREMENTS**

- A. Section 03 20 00 - Concrete Reinforcing: Reinforcing steel for grouted masonry.
- B. Section 04 20 01 - Masonry Veneer: Brick veneer masonry.
- C. Section 07 90 05 - Joint Sealers: Backing rod and sealant at control and expansion joints.

**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 C90 - Standard Specification for Loadbearing Concrete Masonry Units; 2014.
- C. ASTM C91/C91M - Standard Specification for Masonry Cement; 2012.
- D. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete; 2014.
- E. ASTM C140/C140M - Standard Test Methods of Sampling and Testing Concrete Masonry Units and Related Units; 2014.
- F. ASTM C144 - Standard Specification for Aggregate for Masonry Mortar; 2011.
- G. ASTM C150/C150M - Standard Specification for Portland Cement; 2012.
- H. ASTM C207 - Standard Specification for Hydrated Lime for Masonry Purposes; 2006 (Reapproved 2011).
- I. ASTM C270 - Standard Specification for Mortar for Unit Masonry; 2012.
- J. ASTM C404 - Standard Specification for Aggregates for Masonry Grout; 2011.
- K. ASTM C476 - Standard Specification for Grout for Masonry; 2010.
- L. ASTM C780 - Standard Test Method for Preconstruction and Construction Evaluation of Mortars for Plain and Reinforced Unit Masonry; 2012.
- M. ASTM C1019 - Standard Test Method for Sampling and Testing Grout; 2013.
- N. ASTM C1072 - Standard Test Method for Measurement of Masonry Flexural Bond Strength; 2013.
- O. ASTM C1314 - Standard Test Method for Compressive Strength of Masonry Prisms; 2012.
- P. ASTM E518/E518M - Standard Test Methods for Flexural Bond Strength of Masonry; 2010.

**1.04 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data for masonry units and mortar and grout.
- C. Shop Drawings: Indicate bar sizes, spacings, reinforcement quantities, bending and cutting schedules, reinforcement supporting and spacing devices, and accessories.

1. Reinforcing Steel: Detail bending and placement of unit masonry reinforcing bars. Comply with ACI 315, "Details and Detailing of Concrete Reinforcement." Show elevations of reinforced walls.
  2. Masonry Units: Show sizes, profiles, coursing, and locations of special shapes.
- D. Mix Designs: Provide the following for each type of mortar and grout:
1. One of the following for each mortar mix:
    - a. Mix designs indicating type and proportions of ingredients in compliance with the Proportion Specifications of ASTM C 270; or,
    - b. Mix designs and results of mortar tests performed in accordance with the Property Specifications of ASTM C 270.
  2. One of the following for each grout mix:
    - a. Mix designs indicating type and proportions of the ingredients according to the proportion requirements of ASTM C 476; or,
    - b. Mix designs and results of grout strength tests performed in accordance with ASTM C 476; or,
    - c. Results of compressive strength tests performed in accordance with ASTM C 1019, and slump flow and visual stability index (VSI) as determined by ASTM C 1611.
  3. Include test reports, per ASTM C 1019, for grout mixes required to comply with compressive strength requirement.
- E. Manufacturer's Certificate: Certify that masonry units meet or exceed specified requirements.

**1.05 QUALITY ASSURANCE**

- A. Comply with provisions of ACI 530/530.1/ERTA, except where exceeded by requirements of the contract documents.

**1.06 MOCK-UP**

- A. Construct a masonry wall as a mock-up panel sized 8 feet long by 6 feet high; include mortar and accessories, reinforcement, and grout in mock-up.
- B. Locate where directed.
- C. Mock-up may remain as part of the Work.

**1.07 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver, handle, and store masonry units by means that will prevent mechanical damage and contamination by other materials.

**1.08 FIELD CONDITIONS**

- A. Maintain materials and surrounding air temperature to minimum 40 degrees F prior to, during, and 48 hours after completion of masonry work.
- B. Maintain materials and surrounding air temperature to maximum 90 degrees F prior to, during, and 48 hours after completion of masonry work.

**PART 2 PRODUCTS**

**2.01 CONCRETE MASONRY UNITS**

- A. Concrete Block: Comply with referenced standards and as follows:
  1. Size: Standard units with nominal face dimensions of 16 x 8 inches and nominal depths as indicated on the drawings for specific locations.
  2. Special Shapes: Provide non-standard blocks configured for corners.
  3. Load-Bearing Units: ASTM C90, medium weight.
    - a. Hollow block, as indicated.
    - b. Exposed Face Finish: Smooth.
    - c. Color: To match Mutual Materials Gray.

4. Provide structural unit masonry that develops indicated net-area compressive strengths (f'm) at 28 days.

## **2.02 MORTAR AND GROUT MATERIALS**

- A. Masonry Cement: ASTM C91/C91M Type N.
- B. Portland Cement: ASTM C150/C150M, Type I; color as required to produce approved color sample.
  1. Hydrated Lime: ASTM C207, Type S.
  2. Mortar Aggregate: ASTM C144.
  3. Grout Aggregate: ASTM C404.
- C. Water: Clean and potable.

## **2.03 REINFORCEMENT AND ANCHORAGE**

- A. Reinforcing Steel: Type specified in Section 03 20 00; size as indicated on drawings; uncoated finish.

## **2.04 ACCESSORIES**

- A. Preformed Control Joints: Rubber material. Provide with corner and tee accessories, fused joints.
- B. Joint Filler: Closed cell polyvinyl chloride; oversized 50 percent to joint width; self expanding; 1/2 inch wide x by maximum lengths available.
- C. Cleaning Solution: Non-acidic, not harmful to masonry work or adjacent materials.

## **2.05 MORTAR MIXES**

- A. Mortar for Unit Masonry: ASTM C270, using the Proportion Specification.
  1. Engineered masonry: Type M.
  2. Masonry below grade and in contact with earth: Type S.
  3. Exterior, loadbearing masonry: Type N.
  4. Interior, loadbearing masonry: Type N.

## **2.06 MORTAR MIXING**

- A. Thoroughly mix mortar ingredients using mechanical batch mixer, in accordance with ASTM C270 and in quantities needed for immediate use.
- B. Maintain sand uniformly damp immediately before the mixing process.
- C. Do not use anti-freeze compounds to lower the freezing point of mortar.
- D. If water is lost by evaporation, re-temper only within two hours of mixing.

## **2.07 GROUT MIXES**

- A. Bond Beams and Lintels: Strength as indicated in General Structural Notes; 8-10 inches slump, provide premixed type in accordance with ASTM C94/C94M.
  1. Fine grout for spaces with smallest horizontal dimension of 2 inches or less.
  2. Coarse grout for spaces with smallest horizontal dimension greater than 2 inches.
- B. Engineered Masonry: Strength as indicated in General Structural Notes; 8-10 inches slump, provide premixed type in accordance with ASTM C94/C94M.
  1. Fine grout for spaces with smallest horizontal dimension of 2 inches or less.
  2. Coarse grout for spaces with smallest horizontal dimension greater than 2 inches.

## **2.08 GROUT MIXING**

- A. Mix grout in accordance with ASTM C94/C94M.

- B. Thoroughly mix grout ingredients in quantities needed for immediate use in accordance with ASTM C476 for fine and coarse grout.
- C. Add admixtures in accordance with manufacturer's instructions; mix uniformly.
- D. Do not use anti-freeze compounds to lower the freezing point of grout.

## **2.09 PRECONSTRUCTION TESTING**

- A. Testing will be conducted by an independent test agency, in accordance with provisions of Section 01 40 00.
- B. Concrete Masonry: Test each type, class, and grade of concrete masonry unit in accordance with ASTM C140/C140M for conformance to requirements of this specification.
- C. Mortar Mixes: Test mortars prebatched by weight in accordance with ASTM C780 recommendations for preconstruction testing.
- D. Grout Mixes: Test grout batches in accordance with ASTM C1019 procedures.
- E. Compressive Strength: Where indicated, test masonry prisms in accordance with ASTM C1314.
  1. Prepare two sets of prisms; test one set at 7 days and the other at 28 days.
  2. Clay masonry prisms: Height-to-thickness ratio of 5.0.
  3. Concrete masonry prisms: Height-to-thickness ratio of not less than 1.33 and not more than 5.0; apply correction factor per ACI 530/530.1/ERTA for ratio other than 2.0.

## **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 supplied for installation under other sections.
- B. Clean reinforcement of loose rust.
- C. Provide temporary bracing during installation of masonry work. Maintain in place until building structure provides permanent bracing.
- D. For areas where high-lift grouting will be employed, provide cleanout openings as follows:
  1. Hollow Masonry: Not less than 8 inches high at the bottom of each cell to be grouted, formed by cutting out face shell of masonry unit.

### **3.03 COURSING**

- A. Establish lines, levels, and coursing indicated. Protect from displacement.
- B. Maintain masonry courses to uniform dimension. Form vertical and horizontal joints of uniform thickness.
- C. Concrete Masonry Units:
  1. Bond: Running.
  2. Coursing: One unit and one mortar joint to equal 8 inches.
  3. Mortar Joints: Concave.

### **3.04 PLACING AND BONDING**

- A. Lay hollow masonry units with face shell bedding on head and bed joints.
- B. Buttering corners of joints or excessive furrowing of mortar joints is not permitted.



- C. Remove excess mortar as work progresses.
- D. Interlock intersections and external corners, except for units laid in stack bond.
- E. Do not shift or tap masonry units after mortar has achieved initial set. Where adjustment must be made, remove mortar and replace.
- F. Perform job site cutting of masonry units with proper tools to provide straight, clean, unchipped edges. Prevent broken masonry unit corners or edges.
- G. Cut mortar joints flush where wall tile is scheduled or resilient base is scheduled.

### **3.05 REINFORCEMENT AND ANCHORAGE**

- A. Reinforcement Bars: Secure at locations indicated and to avoid displacement during grouting. Minimum spacing between bars or to masonry surfaces shall be one bar diameter.
- B. Reinforced Hollow Unit Masonry: Keep vertical cores to be grouted clear of mortar, including bed area of first course.
  - 1. Bond Beams: At bond beams or other locations for horizontally reinforced masonry, provide special masonry units or saw to accommodate reinforcement.

### **3.06 GROUTING**

- A. Use either high-lift or low-lift grouting techniques, at Contractor's option, subject to other limitations of contract documents.
- B. Refer to General Structural Notes on Drawings.

### **3.07 CONTROL AND EXPANSION JOINTS**

- A. Do not continue horizontal joint reinforcement through control and expansion joints.
- B. Form control joint with a sheet building paper bond breaker fitted to one side of the hollow contour end of the block unit. Fill the resultant core with grout fill. Rake joint at exposed unit faces for placement of backer rod and sealant.
- C. Install preformed control joint device in continuous lengths. Seal butt and corner joints in accordance with manufacturer's instructions.
- D. Size control joint in accordance with Section 07 90 05 for sealant performance.

### **3.08 BUILT-IN WORK**

- A. As work progresses, install built-in metal door frames and other items to be built into the work and furnished under other sections.
- B. Install built-in items plumb, level, and true to line.
- C. Bed anchors of metal door and glazed frames in adjacent mortar joints. Fill frame voids solid with grout.
  - 1. Fill adjacent masonry cores with grout minimum 12 inches from framed openings.
- D. Do not build into masonry construction organic materials that are subject to deterioration.

### **3.09 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 and 1/2 inch in 20 ft or more.
- D. Maximum Variation from Plumb: 1/4 inch per story non-cumulative; 1/2 inch in two stories or more.

- E. Maximum Variation from Level Coursing: 1/8 inch in 3 ft and 1/4 inch in 10 ft; 1/2 inch in 30 ft.
- F. Maximum Variation of Joint Thickness: 1/8 inch in 3 ft.
- G. Maximum Variation from Cross Sectional Thickness of Walls: 1/4 inch.

**3.10 CUTTING AND FITTING**

- A. Cut and fit for chases. 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.

**3.11 FIELD QUALITY CONTROL**

- A. An independent testing agency will perform field quality control tests, as specified in Section 01 40 00.
- B. Concrete Masonry Unit Tests: Test each variety of concrete unit masonry in accordance with ASTM C140/C140M for conformance to requirements of this specification.
- C. Mortar Tests: Test each type of mortar in accordance with recommended procedures in ASTM C780, testing with same frequency as masonry samples.
- D. Test and evaluate grout in accordance with ASTM C1019 procedures.
  - 1. Test with same frequency as specified for masonry units.
- E. Prism Tests: Test masonry and mortar panels for compressive strength in accordance with ASTM C1314 and for flexural bond strength in accordance with ASTM C1072 or ASTM E518/E518M; perform tests and evaluate results.

**3.12 CLEANING**

- A. Remove excess mortar and mortar smears as work progresses.
- B. Replace defective mortar. Match adjacent work.
- C. Clean soiled surfaces with cleaning solution.
- D. Use non-metallic tools in cleaning operations.

**3.13 PROTECTION**

- A. Without damaging completed work, provide protective boards at exposed external corners that are subject to damage by construction activities.

**END OF SECTION**

**STRUCTURAL STEEL FRAMING****PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Structural steel framing members, support members.
- B. Grouting under base plates.

**1.02 RELATED REQUIREMENTS**

- A. Section 01 40 00 - Quality Requirements: Testing and Inspection Agency.
- B. Section 03 45 00 - Precast Architectural Concrete: Precast stair components.
- C. Section 05 31 00 - Steel Decking: Support framing for small openings in deck.
- D. Section 05 50 00 - Metal Fabrications: Steel fabrications affecting structural steel work.
- E. Section 05 51 00 - Metal Stairs and Railings.

**1.03 REFERENCE STANDARDS**

- A. AISC (MAN) - Steel Construction Manual; American Institute of Steel Construction, Inc.; 2011.
- B. AISC S303 - Code of Standard Practice for Steel Buildings and Bridges; American Institute of Steel Construction, Inc.; 2010.
- C. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2012.
- D. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless; 2012.
- E. ASTM A108 - Standard Specification for Steel Bar, Carbon and Alloy, Cold Finished; 2013.
- F. ASTM A307 - Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength; 2012.
- G. ASTM A490 - Standard Specification for Structural Bolts, Alloy Steel, Heat Treated, 150 ksi Minimum Tensile Strength; 2012.
- H. ASTM A490M - Standard Specification for High-Strength Steel Bolts, Classes 10.9 and 10.9.3, for Structural Steel Joints (Metric); 2012.
- I. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes; 2013.
- J. ASTM A501 - Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing; 2007.
- K. ASTM A563 - Standard Specification for Carbon and Alloy Steel Nuts; 2007a (Reapproved 2014).
- L. ASTM A563M - Standard Specification for Carbon and Alloy Steel Nuts [Metric]; 2007.
- M. ASTM A992/A992M - Standard Specification for Structural Steel Shapes; 2011.
- N. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength, Low Alloy, High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardenable; 2013.
- O. ASTM A1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability and Ultra-High Strength; 2014.
- P. ASTM C1107/C1107M - Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink); 2014.

- Q. ASTM F436 - Standard Specification for Hardened Steel Washers; 2011.
- R. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination; American Welding Society; 2012.
- S. AWS D1.1/D1.1M - Structural Welding Code - Steel; American Welding Society; 2010 w/Errata.
- T. RCSC (HSBOLT) - Specification for Structural Joints Using High-Strength Bolts; Research Council on Structural Connections; 2009.
- U. SSPC-Paint 15 - Steel Joist Shop Primer; Society for Protective Coatings; 1999 (Ed. 2004).
- V. SSPC-Paint 20 - Zinc-Rich Primers (Type I, "Inorganic," and Type II, "Organic"); Society for Protective Coatings; 2002 (Ed. 2004).

#### **1.04 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings:
  1. Indicate profiles, sizes, spacing, locations of structural members, openings, attachments, fasteners, and connections.
  2. Connections and splices not detailed.
  3. Indicate cambers.
  4. Indicate welded connections with AWS A2.4 welding symbols. Indicate net weld lengths.
- C. Manufacturer's Mill Certificate: Certify that products meet or exceed specified requirements.
- D. Welders Certificates: Certify welders employed on the Work, verifying AWS qualification within the previous 12 months.

#### **1.05 QUALITY ASSURANCE**

- A. Fabricate structural steel members in accordance with AISC "Steel Construction Manual."
- B. Comply with Section 10 of AISC "Code of Standard Practice for Steel Buildings and Bridges" for architecturally exposed structural steel.
- C. Fabricator: Company specializing in performing the work of this section with minimum 5 years of documented experience.
- D. Erector: Company specializing in performing the work of this section with minimum 5 years of documented experience.
- E. Design connections not detailed on the drawings under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed in Oregon.

### **PART 2 PRODUCTS**

#### **2.01 MATERIALS**

- A. Steel Angles, Plates, and Channels: ASTM A36/A36M.
- B. Steel W Shapes and Tees: ASTM A992/A992M.
- C. Cold-Formed Structural Tubing: ASTM A500/A500M, Grade B.
- D. Hot-Formed Structural Tubing: ASTM A501, seamless or welded.
- E. Steel Sheet: ASTM A1011/A1011M, Designation SS, Grade 30 hot-rolled, or ASTM A1008/A1008M, Designation SS, Grade 30 cold-rolled.
- F. Pipe: ASTM A53/A53M, Grade B, Finish black.
- G. Shear Stud Connectors: Made from ASTM A 108 Grade 1015 bars.

- H. High-Strength Structural Bolts: ASTM A 325 or A 490 (ASTM A 490M), with matching ASTM A 563 (ASTM A 563M) nuts and ASTM F 436 washers; Type 1 alloy steel.
- I. Carbon Steel Bolts: ASTM A 307.
- J. Welding Materials: AWS D1.1; E70XX, type required for materials being welded. CVN 20 ft-lbs at -20 degrees F for welds at structural flange.
- K. Grout: Non-shrink, non-metallic aggregate type, complying with ASTM C1107/C1107M and capable of developing a minimum compressive strength of 7,000 psi at 28 days.
- L. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.
- M. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20, Type I - Inorganic, complying with VOC limitations of authorities having jurisdiction.

**2.02 FABRICATION - GENERAL**

- A. Shop fabricate to greatest extent possible.
- B. Continuously seal joined members by continuous welds. Grind visually exposed welds smooth.
- C. Fabricate connections for bolt, nut, and washer connectors.
- D. Develop required camber for members.

**2.03 FABRICATION - EXPOSED STEEL**

- A. Architectural: All joints as inconspicuous as possible, whether welded or mechanical.
  - 1. Welded Joints: Continuously welded and ground smooth and flush.
  - 2. Mechanical Joints: Butted tight, flush, and hairline; concealed fastenings only.
  - 3. Exposed Edges and Corners: Eased to small uniform radius.
  - 4. Metal Surfaces to be Painted: Sanded or ground smooth, suitable for highest quality gloss finish.

**2.04 FINISH**

- A. Prepare structural component surfaces in accordance with SSPC SP 1, Solvent Cleaning.
- B. Shop prime structural steel members. Do not prime surfaces that will be fireproofed, field welded, in contact with concrete, or high strength bolted.

**2.05 SOURCE QUALITY CONTROL**

- A. High-Strength Bolts: Provide testing and verification of shop-bolted connections in accordance with RCSC "Specification for Structural Joints Using High-Strength Bolts" per Statement of Special Inspections.
- B. Welded Connections: Visually inspect all shop-welded connections and test at least 25 percent of welds per the Statement of Special Inspections.

**PART 3 EXECUTION**

**3.01 EXAMINATION**

- A. Verify that conditions are appropriate for erection of structural steel and that the work may properly proceed.

**3.02 ERECTION**

- A. Erect structural steel in compliance with AISC "Code of Standard Practice for Steel Buildings and Bridges".

- B. Allow for erection loads, and provide sufficient temporary bracing to maintain structure in safe condition, plumb, and in true alignment until completion of erection and installation of permanent bracing.
- C. Field weld components and shear studs indicated on shop drawings.
- D. Use carbon steel bolts only for temporary bracing during construction, unless otherwise specifically permitted on drawings. Install high-strength bolts in accordance with RCSC "Specification for Structural Joints Using High-Strength Bolts".
- E. Do not field cut or alter structural members without approval of Architect.
- F. After erection, prime welds, abrasions, and surfaces not shop primed, except surfaces to be in contact with concrete.
- G. Grout solidly between column plates and bearing surfaces, complying with manufacturer's instructions for nonshrink grout. At exposed locations, trowel grouted surfaces smooth, splaying neatly to 45 degrees.
- H. Exposed Steel: Architectural as specified in Fabrication.

### **3.03 TOLERANCES**

- A. Maximum Variation From Plumb: 1/4 inch per story, non-cumulative.
- B. Maximum Offset From True Alignment: 1/4 inch.

### **3.04 FIELD QUALITY CONTROL**

- A. An independent testing agency will perform field quality control tests, as specified in Section 01 40 00.
- B. High-Strength Bolts: Provide testing and verification of shop-bolted connections in accordance with RCSC "Specification for Structural Joints Using High-Strength Bolts" per Statement of Special Inspections.
- C. Welded Connections: Visually inspect all shop-welded connections and test at least 25 percent of welds per the Statement of Special Inspections.

**END OF SECTION**

## STEEL JOIST FRAMING

### PART 1 GENERAL

#### 1.01 SECTION INCLUDES

- A. Open web steel joists , with bridging, attached seats and anchors.
- B. Supplementary framing for roof openings greater than 18 inches.

#### 1.02 RELATED REQUIREMENTS

- A. Section 01 40 00 - Quality Requirements: Testing and Inspection Agency.
- B. Section 01 62 11 - Delegated Design.
- C. Section 05 12 00 - Structural Steel Framing: Superstructure framing.
- D. Section 05 31 00 - Steel Decking: Support framing for openings less than 18 inches in decking.

#### 1.03 REFERENCE STANDARDS

- A. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2012.
- B. ASTM A307 - Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength; 2012.
- C. ASTM E94 - Standard Guide for Radiographic Examination; 2004 (Reapproved 2010).
- D. ASTM E164 - Standard Practice for Contact Ultrasonic Testing of Weldments; 2013.
- E. ASTM E165/E165M - Standard Test Method for Liquid Penetrant Examination for General Industry; 2012.
- F. ASTM E709 - Standard Guide for Magnetic Particle Testing; 2014.
- G. AWS D1.1/D1.1M - Structural Welding Code - Steel; American Welding Society; 2010 w/Errata.
- H. IAS AC172 - Accreditation Criteria for Fabricator Inspection Programs for Structural Steel; International Accreditation Service, Inc.; 2011.
- I. RCSC (HSBOLT) - Specification for Structural Joints Using High-Strength Bolts; Research Council on Structural Connections; 2009.
- J. SJI (SPEC) - Catalog of Standard Specifications and Load Tables for Steel Joists and Joist Girders; Steel Joist Institute; 2011.
- K. SJI Technical Digest No. 9 - Handling and Erection of Steel Joists and Joist Girders; Steel Joist Institute; 2008.
- L. SSPC-Paint 15 - Steel Joist Shop Primer; Society for Protective Coatings; 1999 (Ed. 2004).
- M. SSPC-SP 2 - Hand Tool Cleaning; Society for Protective Coatings; 1982 (Ed. 2004).

#### 1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Indicate standard designations, joist coding, configurations, sizes, spacings, cambers, locations of joists, bridging, connections, and attachments.
  - 1. Include the design engineer's stamp or seal on each sheet of shop drawings.
- C. Calculations: Submit structural calculations prepared and stamped by Oregon registered structural engineer.
- D. Manufacturer's Qualification Statement: Provide documentation showing steel fabricator is accredited under IAS AC172.

- E. Certification: Submit certification of SJI quality control for supplied components.

### **1.05 QUALITY ASSURANCE**

- A. Design connections not detailed on the drawings under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed in Oregon.
- B. Perform Work, including that for headers and other supplementary framing, in accordance with SJI Standard Specifications Load Tables and SJI Technical Digest No.9.
- C. Manufacturer Qualifications: Company specializing in performing the work of this section with minimum five years documented experience.
- D. Fabricator Qualifications: A qualified steel fabricator that is accredited by the International Accreditation Service (IAS) Fabricator Inspection Program for Structural Steel (AC172).
- E. Erector Qualifications: Company specializing in performing the work of this section with minimum three years documented experience.

### **1.06 DELIVERY, STORAGE, AND HANDLING**

- A. Transport, handle, store, and protect products to SJI requirements.

## **PART 2 PRODUCTS**

### **2.01 MATERIALS**

- A. Open Web Joists: SJI Type LH Joists:
  1. Provide bottom chord extensions as indicated.
  2. Minimum End Bearing on Steel Supports: Comply with referenced SJI standards.
  3. Minimum End Bearing on Masonry or Concrete Supports: Comply with referenced SJI standards.
  4. Finish: Shop primed.
- B. Anchor Bolts, Nuts and Washers: ASTM A 307, plain.
- C. Structural Steel For Supplementary Framing and Joist Leg Extensions: ASTM A 36/A 36M.
- D. Welding Materials: AWS D1.1/D1.1M; type required for materials being welded.
- E. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.

### **2.02 FABRICATION**

- A. Frame special sized openings in joist web framing as detailed.

### **2.03 FINISH**

- A. Shop prime joists as specified.
- B. Prepare surfaces to be finished in accordance with SSPC-SP 2.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify existing conditions prior to beginning work.

### **3.02 ERECTION**

- A. Erect joists with correct bearing on supports.
- B. Allow for erection loads. Provide sufficient temporary bracing to maintain framing safe, plumb, and in true alignment.
- C. After joist alignment and installation of framing, field weld joist seats to steel bearing surfaces.



- D. Install supplementary framing for floor and roof openings greater than 18 inches.
- E. Do not permit erection of decking until joists are braced bridged, and secured or until completion of erection and installation of permanent bridging and bracing.
- F. Do not field cut or alter structural members without approval of joist manufacturer.
- G. After erection, prime welds, damaged shop primer, damaged galvanizing, and surfaces not shop primed, except surfaces specified not to be primed.

**3.03 TOLERANCES**

- A. Maximum Variation From Plumb: 1/4 inch.
- B. Maximum Offset From True Alignment: 1/4 inch.

**3.04 FIELD QUALITY CONTROL**

- A. An independent testing agency will perform field quality control tests, as specified in Section 01 40 00.
- B. High-Strength Bolts: Provide testing and verification of field-bolted connections in accordance with RCSC "Specification for Structural Joints Using High-Strength Bolts", testing at least 25 percent of bolts at each connection.
- C. Welded Connections: Visually inspect all field-welded connections and test at least 25 percent of welds using one of the following:
  - 1. Radiographic testing performed in accordance with ASTM E94.
  - 2. Ultrasonic testing performed in accordance with ASTM E164.
  - 3. Liquid penetrant inspection performed in accordance with ASTM E165/E165M.
  - 4. Magnetic particle inspection performed in accordance with ASTM E709.

**END OF SECTION**

## STEEL DECKING

### PART 1 GENERAL

#### 1.01 SECTION INCLUDES

- A. Acoustical roof deck.
- B. Roof deck.
- C. Composite floor deck.
- D. Supplementary framing for openings up to and including 18 inches.
- E. Bearing plates and angles.

#### 1.02 RELATED REQUIREMENTS

- A. Section 01 40 00 - Quality Requirements: Testing and Inspection Agency.
- B. Section 03 20 00 - Concrete Reinforcing.
- C. Section 03 30 00 - Cast-in-Place Concrete: Concrete topping over metal deck.
- D. Section 05 12 00 - Structural Steel Framing: Support framing for openings larger than 18 inches and shear stud connectors.
- E. Section 05 21 00 - Steel Joist Framing: Support framing for openings larger than 18 inches and shear stud connectors.
- F. Section 05 50 00 - Metal Fabrications: Support framing for openings larger than 18 inches.

#### 1.03 REFERENCE STANDARDS

- A. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2012.
- B. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2013.
- C. AWS D1.3 - Structural Welding Code - Sheet Steel; American Welding Society; 2008.
- D. FM P7825 - Approval Guide; Factory Mutual Research Corporation; current edition.
- E. SDI (DM) - Publication No.31, Design Manual for Composite Decks, Form Decks, Roof Decks; Steel Deck Institute; 2007.
- F. SSPC-Paint 20 - Zinc-Rich Primers (Type I, "Inorganic," and Type II, "Organic"); The Society for Protective Coatings; 2002 (Ed. 2004).

#### 1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittals procedures.
- B. Shop Drawings: Indicate deck plan, support locations, projections, openings, reinforcement, pertinent details, and accessories.
- C. Product Data: Provide deck profile characteristics, dimensions, structural properties, and finishes.

#### 1.05 QUALITY ASSURANCE

- A. Design deck layout, spans, fastening, and joints under direct supervision of a Professional Engineer experienced in design of this work and licensed in Oregon.
- B. Installer Qualifications: Company specializing in performing the work of this Section with minimum 3 years of experience.

**1.06 DELIVERY, STORAGE, AND HANDLING**

- A. Cut plastic wrap to encourage ventilation.
- B. Separate sheets and store deck on dry wood sleepers; slope for positive drainage.

**PART 2 PRODUCTS****2.01 MANUFACTURERS**

- A. Steel Deck:
  1. Canam Steel Corporation: [www.canam-steeljoists.ws](http://www.canam-steeljoists.ws).
  2. Cordeck, Inc: [www.cordeck.com](http://www.cordeck.com).
  3. Nucor-Vulcraft Group: [www.vulcraft.com](http://www.vulcraft.com).
  4. Verco Decking, Inc: [www.vercodeck.com](http://www.vercodeck.com).
  5. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Acoustical Deck:
  1. Epicore Roof Deck by Epic Metals: [www.epicmetals.com](http://www.epicmetals.com).
  2. Substitutions: See Section 01 60 00 - Product Requirements.

**2.02 STEEL DECK**

- A. Acoustical Roof Deck: Non-composite type, steel sheet with plain vertical flute faces perforated with 1/8 inch diameter holes staggered 3/8 inch on center; internal glass or mineral fiber insulation with continuous galvanized mesh:
  1. Galvanized Steel Sheet: ASTM A653/A653M, Structural Steel (SS) , with G90/Z275 galvanized coating.
  2. Primer: Shop coat of manufacturer's standard primer paint over cleaned and phosphatized substrate.
  3. Minimum Base Metal Thickness: As indicated on Drawings.
  4. Nominal Height: As indicated on Drawings.
  5. Profile: Continuous dovetail-shaped ribs.
  6. Formed Sheet Width: 24 inch.
  7. Side Joints: As indicated on Drawings.
  8. End Joints: As indicated on Drawings.
  9. NRC Rating: 0.95.
- B. Roof Deck: Non-composite type, fluted steel sheet; FM Global approved:
  1. Galvanized Steel Sheet: ASTM A653/A653M, Structural Steel (SS) , with G60/Z180 galvanized coating.
  2. Primer: Shop coat of manufacturer's standard primer paint over cleaned and phosphatized substrate.
  3. Minimum Base Metal Thickness: As indicated on Drawings.
  4. Nominal Height: As indicated on Drawings.
  5. Profile: Fluted; SDI Type - B.
  6. Formed Sheet Width: 24 inch.
  7. Side Joints: As indicated on Drawings.
  8. End Joints: As indicated on Drawings.
- C. Composite Floor Deck: Fluted steel sheet embossed to interlock with concrete:
  1. Galvanized Steel Sheet: ASTM A653/A653M, Structural Steel (SS) Grade 33/230, with G90/Z275 galvanized coating.
  2. Primer: Shop coat of manufacturer's standard primer paint over cleaned and phosphatized substrate.
  3. Minimum Base Metal Thickness: As indicated on Drawings.
  4. Nominal Height: As indicated on Drawings.
  5. Profile: SDI, fluted"W" Type, unless noted otherwise.
  6. Formed Sheet Width: 24 inch.
  7. Side Joints: As indicated on Drawings.
  8. End Joints: As indicated on Drawings.

**2.03 ACCESSORY MATERIALS**

- A. Bearing Plates and Angles: ASTM A36/A36M steel, unfinished.
- B. Fasteners: Galvanized hardened steel, self tapping.
- C. Weld Washers: Mild steel, uncoated, 3/4 inch outside diameter, 1/8 inch thick.
- D. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20, complying with VOC limitations of authorities having jurisdiction.
- E. Flute Closures: Closed cell foam rubber, 1 inch thick; profiled to fit tight to the deck.
- F. Acoustical Insulation: Glass fiber type, minimum 1.1 lb/cu ft density; profiled to suit deck.
- G. Edge Forms.

**PART 3 EXECUTION****3.01 INSTALLATION**

- A. Erect metal deck in accordance with SDI Design Manual and manufacturer's instructions. Align and level.
- B. On concrete and masonry surfaces provide minimum 4 inch bearing.
- C. On steel supports provide minimum 2 inch bearing.
- D. Fasten deck to steel support members at ends and intermediate supports.
- E. Weld deck in accordance with AWS D1.3.
- F. Close openings above walls and partitions perpendicular to deck flutes with single row of foam cell closures.
- G. Place metal cant strips in position and fusion weld.
- H. Position roof drain pans with flange bearing on top surface of deck. Fusion weld at each deck flute.
- I. Immediately after welding deck and other metal components in position, coat welds, burned areas, and damaged surface coating, with touch-up primer.

**3.02 FIELD QUALITY CONTROL**

- A. An independent testing agency will perform field quality control tests, as specified in Section 01 40 00.
- B. Testing and inspection of field welds.

**END OF SECTION**

## COLD-FORMED METAL FRAMING

### PART 1 GENERAL

#### 1.01 SECTION INCLUDES

- A. Formed steel stud exterior wall and interior bearing wall framing.
- B. Exterior wall Z furring.
- C. Formed steel joist framing and bridging.
- D. Thermal isolation strips.

#### 1.02 RELATED REQUIREMENTS

- A. Section 01 40 00 - Quality Requirements: Testing and Inspection Agency.
- B. Section 05 12 00 - Structural Steel Framing: Structural building framing.
- C. Section 04 20 01 - Masonry Veneer: Veneer masonry supported by wall stud metal framing.
- D. Section 05 31 00 - Steel Decking.
- E. Section 07 21 00 - Thermal Insulation: Insulation within framing members.
- F. Section 07 90 05 - Joint Sealers.
- G. Section 09 21 16 - Gypsum Board Assemblies: Lightweight, non-load bearing metal stud framing.

#### 1.03 REFERENCE STANDARDS

- A. AISI SG02-1 - North American Specification for the Design of Cold-Formed Steel Structural Members; American Iron and Steel Institute; 2001 with 2004 supplement. (replaced SG-971)
- B. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2009.
- C. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2013.
- D. ASTM C955 - Standard Specification for Load-Bearing (Transverse and Axial) Steel Studs, Runners (Tracks), and Bracing or Bridging for Screw Application of Gypsum Panel Products and Metal Plaster Bases; 2011c.
- E. SSPC-Paint 20 - Zinc-Rich Primers (Type I, "Inorganic," and Type II, "Organic"); Society for Protective Coatings; 2002 (Ed. 2004).

#### 1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on standard framing members; describe materials and finish, product criteria, limitations and proposed use and location.
- C. Product Data: Provide manufacturer's data on factory-made framing connectors, showing compliance with requirements.
- D. Manufacturer's Installation Instructions: Indicate special procedures, conditions requiring special attention .

#### 1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the types of products specified in this section, and with minimum three years of documented experience.
- B. Installer Qualifications: Company specializing in performing the work of this section with minimum three years documented experience and approved by manufacturer.

**PART 2 PRODUCTS****2.01 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.

**2.02 FRAMING MATERIALS**

- A. Studs and Track: ASTM C955; studs formed to channel, "C", or "Sigma" shape with punched web; U-shaped track in matching nominal width and compatible height.
  - 1. Gage and Depth: As indicated on the drawings.
  - 2. Galvanized in accordance with ASTM A653/A653M, G90/Z275 coating at exterior walls and G60/Z180 at interior walls.
- B. Exterior Z Furring: Fabricated from ASTM A653/A653M steel sheet, with G90/Z275 hot dipped galvanized coating.
  - 1. Gage and Depth: As indicated on Drawings.
- C. Framing Connectors: Factory-made, formed steel sheet.
  - 1. Structural Performance: Maintain load and movement capacity required by applicable code, when evaluated in accordance with AISI North American Specification for the Design of Cold Formed Steel Structural Members.
  - 2. Movement Connections: Provide mechanical anchorage devices that accommodate movement using slotted holes, shouldered screws or screws and anti-friction or stepped bushings, while maintaining structural performance of framing. Provide movement connections where indicated on drawings.
    - a. Where continuous studs bypass elevated floor slab, connect stud to slab in manner allowing vertical and horizontal movement of slab without affecting studs; allow for minimum movement of 1/2 inch.
    - b. Where top of stud wall terminates below structural floor or roof, connect studs to structure in manner allowing vertical and horizontal movement of slab without affecting studs; allow for minimum movement of 1/2 inch.
    - c. Provide top track preassembled with connection devices spaced to fit stud spacing indicated on drawings; minimum track length of 12 feet.
    - d. Products: Safeco Steel Stud Company, Item identifiers as indicated on Drawings, or equal.
  - 3. Fixed Connections: Provide non-movement connections for tie-down to foundation, floor-to-floor tie-down, roof-to-wall tie-down, joist hangers, gusset plates, and stiffeners as indicated on Drawings.

**2.03 ACCESSORIES**

- A. Bracing, Furring, Bridging: Formed sheet steel, thickness determined for conditions encountered; finish to match framing components.
- B. Thermal Isolation Strips: Flexible, non-porous aerogel blanket insulation; 1-1/2 inch wide strip, 0.39 inch thickness; self-adhering.
  - 1. Thermablok by Thermablok, Inc: [www.thermoblok.com](http://www.thermoblok.com).
  - 2. Substitutions: See Section 01 60 00 - Product Requirements.
- C. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20, Type I - Inorganic, complying with VOC limitations of authorities having jurisdiction.

**2.04 FASTENERS**

- A. Self-Drilling, Self-Tapping Screws, Bolts, Nuts and Washers: Hot dip galvanized per ASTM A153/A153M.
  - 1. See General Structural Notes on Drawings.
- B. Anchorage Devices: Powder actuated.
  - 1. See General Structural Notes on Drawings.

**PART 3 EXECUTION****3.01 EXAMINATION**

- A. Verify that substrate surfaces are ready to receive work.

**3.02 INSTALLATION OF STUDS**

- A. Install components in accordance with manufacturers' instructions and ASTM C1007 requirements.
- B. Align floor and ceiling tracks; locate to wall layout. Secure in place with fasteners at maximum 24 inches on center. Coordinate installation of sealant with floor and ceiling tracks.
- C. Place studs at 16 inches on center; not more than 2 inches from abutting walls and at each side of openings. Connect studs to tracks using clip and tie method.
- D. Construct corners using minimum of three studs. Install double studs at wall openings, door and window jambs.
- E. Install load bearing studs full length in one piece. Splicing of studs is not permitted.
- F. Coordinate placement of insulation in multiple stud spaces made inaccessible after erection.
- G. Install intermediate studs above and below openings to align with wall stud spacing.
- H. Provide deflection allowance in stud track, directly below horizontal building framing at non-load bearing framing.
- I. Touch-up field welds and damaged galvanized surfaces with primer.

**3.03 INSTALLATION OF EXTERIOR FURRING**

- A. Install furring components in accordance with manufacturer's instructions.
- B. Install thermal isolation strips between furring and substrate in accordance with manufacturer's instructions.
- C. Place furring at 16 and 24 inches o.c. as indicated on Drawings. Connect furring to studs using fastener method.

**3.04 TOLERANCES**

- A. Maximum Variation from True Position: 1/4 inch.
- B. Maximum Variation of any Member from Plane: 1/4 inch.

**3.05 FIELD QUALITY CONTROL**

- A. An independent testing agency will perform field quality control tests, as specified in Section 01 40 00.
- B. Testing and inspection of automatic stud welding.

**END OF SECTION**

## METAL FABRICATIONS

### PART 1 GENERAL

#### 1.01 SECTION INCLUDES

- A. Shop fabricated steel and aluminum items, including:
  - 1. Sunshades.
  - 2. Support for ceiling suspended toilet partitions.
  - 3. Concealed metal support for overhead grilles and doors.
  - 4. Bench supports.
  - 5. Lintels.
  - 6. Relieving Angles.
  - 7. Grates for elevator sump.
  - 8. Elevator hoistway beams.
  - 9. Ladder at elevator pit.
  - 10. Bleacher support.
  - 11. Wire mesh screens and gates at covered walks.
  - 12. Miscellaneous supports for mechanical equipment.
  - 13. Concealed metal braces in architectural woodwork.
  - 14. Other work as indicated on Drawings.

#### 1.02 RELATED REQUIREMENTS

- A. Section 01 40 00 - Quality Requirements: Independent Testing Agency.
- B. Section 03 30 00 - Cast-in-Place Concrete: Placement of metal fabrications in concrete.
- C. Section 04 20 01 - Masonry Veneer: Placement of metal fabrications in brick veneer.
- D. Section 04 27 31 - Reinforced Unit Masonry: Placement of metal fabrications in masonry.
- E. Section 05 12 00 - Structural Steel Framing: Structural steel and beams.
- F. Section 05 31 00 - Steel Decking.
- G. Section 05 51 00 - Metal Stairs.
- H. Section 05 51 33 - Ladders: Aluminum ladders.
- I. Section 09 90 00 - Painting and Coating: Paint finish.
- J. Section 12 66 13 - Telescoping Bleachers.
- K. 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/A36M - Standard Specification for Carbon Structural Steel; 2012.
- C. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2013.
- D. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2009.
- E. ASTM A283/A283M - Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates; 2013.
- F. ASTM A307 - Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength; 2012.
- G. ASTM A325 - Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength; 2010.



- H. ASTM A325M - Standard Specification for Structural Bolts, Steel, Heat Treated 830 MPa Minimum Tensile Strength (Metric); 2013.
- I. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes; 2013.
- J. AWS D1.1/D1.1M - Structural Welding Code - Steel; American Welding Society; 2010 w/Errata.
- K. SSPC-Paint 15 - Steel Joist Shop Primer; Society for Protective Coatings; 1999 (Ed. 2004).
- L. SSPC-Paint 20 - Zinc-Rich Primers (Type I, "Inorganic," and Type II, "Organic"); Society for Protective Coatings; 2002 (Ed. 2004).
- M. SSPC-SP 2 - Hand Tool Cleaning; Society for Protective Coatings; 1982 (Ed. 2004).

#### **1.04 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories. Include erection drawings, elevations, and details where applicable.

### **PART 2 PRODUCTS**

#### **2.01 MATERIALS - STEEL**

- A. Steel Angles, Channel and Plates: ASTM A36/A36M.
- B. Steel Tubing: ASTM A500/A500M, Grade B cold-formed structural tubing.
- C. Plates: ASTM A283.
- D. Carbon Steel Bolts: ASTM A 307.
- E. High Strength Bolts, Nuts, and Washers: ASTM A325 (ASTM A325M), Type 1, galvanized to ASTM A153/A153M where connecting galvanized components.
- F. Welding Materials: AWS D1.1/D1.1M; type required for materials being welded.
- G. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.
- H. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20, Type I - Inorganic, complying with VOC limitations of authorities having jurisdiction.
- I. Concrete Anchors: As indicated on Structural Drawings.
- J. Concrete Screws: As indicated on Structural Drawings.
- K. Epoxy Bolts: Threaded steel rods. As indicated on Structural Drawings.
- L. Galvanized Steel Sheet: ASTM A 653/A 653M, with G90/Z275 zinc coating, thickness as indicated on Drawings.

#### **2.02 MATERIALS - ALUMINUM**

- A. Aluminum Grate (Sunshades): Aluminum bar grating, swaged construction, mill finish.
  1. Series SGAL 150A by McNichols Company: [www.mcnichols.com](http://www.mcnichols.com)
  2. Substitutions: See Section 01 60 00 - Product Requirements.

#### **2.03 MATERIALS - WIRE FABRIC**

- A. Wire Fabric Sheet: 0.162 inch (18 gage) steel wire, intercrimp fabric; square mesh, 1 inch center to center wire spacing.
  1. McNichols Co., [www.mcnichols.com](http://www.mcnichols.com).

2. Substitutions: See Section 01 60 00 - Product Requirements.

#### **2.04 ACCESSORIES**

- A. Bolts, Nuts, and Washers: Stainless steel.
- B. Isolation Material: Neoprene washers and strips.
- C. Sealant: Type B - MS Polymer Sealant specified in Section 07 90 05.
- D. Cable: Stainless steel, 1/4 inch diameter, 1x19 construction cable; with matching fixed ends and tension adjusting fittings.

#### **2.05 FABRICATION**

- A. Fit and shop assemble items in largest practical sections, for delivery to site.
- B. Fabricate items with joints tightly fitted and secured.
- C. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.
- D. Exposed Mechanical Fastenings: Flush countersunk screws or bolts; unobtrusively located; consistent with design of component, except where specifically noted otherwise.
- E. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.

#### **2.06 FABRICATED ITEMS**

- A. Elevator Pit Ladders: Steel; in compliance with ANSI A14.3; with mounting brackets and attachments; galvanized 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.
- B. Relieving Angles: Galvanized steel; prime paint finish.
- C. Lintels: As detailed; galvanized finish.
- D. Door Frames for Overhead Door Openings and Wall Openings: Channel and Angle sections; galvanized finish.
- E. Elevator Hoistway Beams: Beam sections; prime paint finish.
- F. Toilet Partition Suspension Members: Steel structural sections; prime paint finish.
- G. Elevator Pit Grates: Steel; fully welded; band cut ends; galvanized finish.
  - 1. Bearing Bars: 1-1/4 x 1/8 inch spaced 1-3/16 inch on center.
  - 2. Cross Bars: 3/16 inch spaced 4 inches on center.
- H. Sunshades: Refer to Drawings.
  - 1. Structure, Frame and Brackets: Fabricated steel; galvanized; powder coat finished; color as selected.
  - 2. Grating: Aluminum, mill finish; powder coated finish; color as selected.
  - 3. Support Cable: Stainless steel.
  - 4. Fabrication: Per Section 05 12 00.
- I. Covered Walk Gates: Steel; fully welded; galvanized finish.
  - 1. Layout as indicated on Drawings.
  - 2. Steel tube stile and rails with wire mesh facing.
- J. Bleacher Support Bracket: Steel; fully welded; galvanized finish.
  - 1. Configuration as indicated on Drawings.

**2.07 FINISHES - STEEL**

- A. Prepare surfaces to be primed in accordance with SSPC-SP2.
- B. Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.
- C. Prime Painting: One coat; prepare galvanized surfaces prior to priming.
- D. Galvanizing of Structural Steel Members: Galvanize after fabrication to ASTM A123/A123M requirements. Provide minimum 2.0 oz/sq ft galvanized coating.
- E. Galvanizing of Non-structural Items: Galvanize after fabrication to ASTM A123/A123M requirements.

**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.

**3.02 PREPARATION**

- A. Supply setting templates to the appropriate entities for steel items required to be cast into concrete.

**3.03 INSTALLATION**

- A. Install items plumb and level, accurately fitted, free from distortion or defects.
- B. Provide for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.
- C. Field weld components indicated .
- D. Perform field welding in accordance with AWS D1.1/D1.1M.
- E. Obtain approval prior to site cutting or making adjustments not scheduled.
- F. After erection, prime welds, abrasions, and surfaces not shop primed or galvanized, except surfaces to be in contact with concrete.

**3.04 TOLERANCES**

- A. Maximum Variation From Plumb: 1/4 inch per story, non-cumulative.
- B. Maximum Offset From True Alignment: 1/4 inch.
- C. Maximum Out-of-Position: 1/4 inch.

**3.05 FIELD QUALITY CONTROL**

- A. An independent testing agency will perform field quality control tests, as specified in Section 01 40 00.

B. Special inspection for post-installed concrete anchors.

**END OF SECTION**

## METAL STAIRS AND RAILINGS

### PART 1 GENERAL

#### 1.01 SECTION INCLUDES

- A. Engineered structural steel stair framing and supports.
- B. Engineered handrails and guardrails at stairs and landings.

#### 1.02 RELATED REQUIREMENTS

- A. Section 01 40 00 - Quality Requirements: Testing and Inspection Agency.
- B. Section 01 62 11 - Delegated Design.
- C. Section 03 30 00 - Cast-in-Place Concrete: Placement of metal anchors in concrete; concrete fill.
- D. Section 03 35 20 - Polished Concrete Finish: Finish on concrete treads, risers and landings.
- E. Section 03 45 00- Precast Architectural Concrete: Precast treads and risers.
- F. Section 04 22 00 - Concrete Unit Masonry: Placement of metal fabrications in masonry.
- G. Section 09 90 00 - Painting and Coating: Paint finish.

#### 1.03 REFERENCE STANDARDS

- A. ASTM A6/A6M - Standard Specification for General Requirements for Rolled Structural Steel Bars, Plates, Shapes, and Sheet Piling; 2014.
- B. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2012.
- C. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2009.
- D. ASTM A 269 - Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Use; 2004.
- E. ASTM A283/A283M - Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates; 2013.
- F. ASTM A325 - Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength; 2010.
- G. ASTM A325M - Standard Specification for Structural Bolts, Steel, Heat Treated 830 MPa Minimum Tensile Strength (Metric); 2013.
- H. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2013.
- I. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination; American Welding Society; 2012.
- J. AWS D1.1/D1.1M - Structural Welding Code - Steel; American Welding Society; 2010 w/Errata.
- K. SSPC-Paint 15 - Steel Joist Shop Primer; Society for Protective Coatings; 1999 (Ed. 2004).
- L. SSPC-SP 2 - Hand Tool Cleaning; Society for Protective Coatings; 1982 (Ed. 2004).

#### 1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories.
  - 1. Indicate welded connections using standard AWS A2.4 welding symbols. Indicate net weld lengths.

2. Include the design engineer's stamp or seal on each sheet of shop drawings.
- C. Delegated Design Data: As required by authorities having jurisdiction.
- D. Design Calculations: Submit design calculations prepared by Oregon registered engineer for all pre-engineered stairs, handrails and guardrails.
- E. Welders' Certificates.

### **1.05 QUALITY ASSURANCE**

- A. Structural Designer Qualifications: Professional Structural Engineer experienced in design of this work and licensed in Oregon, 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. A company specializing in manufacturing products specified in this section, with not less than five years of documented experience.

## **PART 2 PRODUCTS**

### **2.01 METAL STAIRS - GENERAL**

- A. Metal Stairs: Provide stairs of the design specified, complete with landing platforms, vertical and horizontal supports, railings, and guards, fabricated accurately for anchorage to each other and to building structure.
  1. Regulatory Requirements: Provide stairs and railings complying with the most stringent requirements of local, state, and federal regulations; where requirements of the contract documents exceed those of regulations, comply with the contract documents.
  2. Handrails: Comply with applicable accessibility requirements of ADA Standards.
  3. Structural Design: Provide complete stair and railing assemblies complying with the applicable local code.
  4. Dimensions: As indicated on drawings.
  5. Shop assemble components; disassemble into largest practical sections suitable for transport and access to site.
  6. No sharp or rough areas on exposed travel surfaces and surfaces accessible to touch.
  7. Separate dissimilar metals using paint or permanent tape.
- B. Metal Jointing and Finish Quality Levels:
  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.
- 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 SUPPORTED STAIRS**

- A. Jointing and Finish Quality Level: Architectural, as defined above.
- B. Treads: Precast concrete, see Section 03 45 00; supported by bent steel tread pans as indicated on Drawings.
- C. Risers: Closed; same material and thickness as tread pans.
- D. Stringers: Rolled steel channels.
  1. Stringer Depth: As indicated on drawings or as required by design.

- 2. End Closure: Sheet steel of same thickness as risers welded across ends.
- E. Landings: Similar construction, using corrugated steel decking, supported and reinforced as required to achieve design load capacity; cast-in-place concrete surface.
- F. Railings: Layout and details as indicated on Drawings.
- G. Guardrail Infill: Wire mesh.
- H. Finish: Shop- or factory-prime painted; field finished.

### 2.03 HANDRAILS AND GUARDS

- A. Handrails: Stainless steel round pipe rails unless otherwise indicated.
  - 1. Outside Diameter: 1.66 inch, nominal 1-1/4 inch inside diameter.
  - 2. Configurations: As indicated on Drawings; stair system attached, wall attached and free standing.
- B. Guardrails: Refer to Drawings.
  - 1. Top and Bottom Rails: Flat bar as indicated on Drawings.
  - 2. Infill at Mesh Railings: Flat woven wire mesh panels.
    - a. Material and Finish: Plain steel.
    - b. Wire Size: 11 gage on 8 gage.
    - c. Wire Spacing: 1-1/16 x 4-1/2 inch.
    - d. Mounting: Mesh welded to vertical supports and top and bottom rails.
    - e. Mounting: Mesh welded to steel bar frame, frame welded to posts.
    - f. Basis of Design:
      - 1) The Western Group: [www.architecturalwire.com](http://www.architecturalwire.com).
      - 2) Substitutions: See Section 01 60 00 - Product Requirements.
  - 3. End and Intermediate Posts: Same material and size as top rails.
    - a. Horizontal Spacing: As indicated on drawings or as needed by design.
    - b. Mounting: Welded to top surface of stringer.

### 2.04 MATERIALS

- A. Steel Sections: ASTM A 36/A 36M.
- B. Stainless Steel Tubing: ASTM A 269, Type 304.
- C. Steel Plates: ASTM A6/A6M or ASTM A283/A283M.
- 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/A1011M, Designation CS (commercial steel).
  - 2. Cold-Rolled Steel Sheet: ASTM A1008/A1008M, Designation CS (commercial steel).
- E. Ungalvanized Steel Sheet: ASTM A 1008/A 1008M, Designation SS, Grade 33, Type 1.
- F. Galvanized Steel Sheet: ASTM A653/A653M, Structural Steel (SS) Grade 33/230 with G40/Z120 coating.
- G. Concrete Fill: Type specified in Section 03 30 00.

### 2.05 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. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.

### 2.06 SHOP FINISHING

- A. Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.

- B. Do not prime surfaces in direct contact with concrete or where field welding is required.
- C. Prime Painting: Use specified shop- and touch-up primer.
  1. Preparation of Steel: In accordance with SSPC-SP 2, Hand Tool Cleaning.
  2. Preparation of Galvanized Surfaces: Prepare as recommended by primer manufacturer for proper coating bond.
  3. Number of Coats: One.

### **PART 3 EXECUTION**

#### **3.01 EXAMINATION**

- A. Verify that field conditions are acceptable and are ready to receive work.

#### **3.02 PREPARATION**

- A. When field welding is required, clean and strip primed steel items to bare metal.
- B. Supply items required to be cast into concrete and embedded in masonry with setting templates.

#### **3.03 INSTALLATION**

- A. Install components plumb and level, accurately fitted, free from distortion or defects.
- B. Provide anchors, plates, angles, hangers, and struts required for connecting stairs to structure.
- C. Allow for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.
- D. Provide welded field joints where specifically indicated on drawings. Perform field welding in accordance with AWS D1.1/D1.1M.
- E. Other field joints may be either welded or bolted provided the result complies with the limitations specified for jointing quality levels.
- F. Obtain approval prior to site cutting or creating adjustments not scheduled.
- G. After erection, prime welds, abrasions, and surfaces not shop primed or galvanized, except surfaces to be in contact with concrete.

#### **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. An independent testing agency will perform field quality control tests, as specified in Section 01 40 00.
- B. High-Strength Bolts: Provide testing and verification of field-bolted connections in accordance with AISC "Specification for Structural Joints Using ASTM A325 or A490 Bolts", testing at least 25 percent of bolts at each connection.
- C. Welded Connections: Visually inspect all field-welded connections and test at least 25 percent of welds using one of the following:
  1. testing performed in accordance with ASTM E 94.
  2. Ultrasonic testing performed in accordance with ASSTM E 164.
  3. Liquid penetrant inspection performed in accordance with ASTM E 165.
  4. magnetic particle inspection performed in accordance with ASTM E 709.

**END OF SECTION**



## LADDERS

### PART 1 GENERAL

#### 1.01 SECTION INCLUDES

- A. Ships ladders.
- B. Wall ladders.
- C. Mounting hardware.

#### 1.02 RELATED SECTIONS

- A. Section 05 50 00 - Metal Fabrications: Fabricated elevator pit ladders.

#### 1.03 REFERENCES

- A. ASTM B 209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
- B. ASTM B 221- Standard Specification for Aluminum and Aluminum-Alloy Extruded bars, Rods, Wire, Profiles, and Tubes.
- C. OSHA 1910.27 - Fixed Ladders.

#### 1.04 DESIGN REQUIREMENTS

- A. Designed and engineered pre-fabricated ladder system.
- B. Comply with OSHA 1910.27 and Oregon Structural Specialty Code.
- C. Loading Design: Minimum 300 pounds, minimum.

#### 1.05 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide manufactures standard product data.
- C. Shop Drawings: Indicate profiles, sizes, connection attachments, reinforcing, size and type of fasteners, and accessories. Indicate erection drawings, elevations, and details where applicable.
- D. Manufacturer's Instructions: Indicate installation requirements.

#### 1.06 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years of documented experience.

#### 1.07 WARRANTY

- A. See Section 01 78 00 - Closeout Requirements.
- B. Provide manufacturer's standard product warranty.

### PART 2 PRODUCTS

#### 2.01 SHIPS LADDER

- A. Type: Fixed inclined ladder; 75 degree incline.
- B. Width: 24 inches clear thread.
- C. Treads: Tubular aluminum extrusions, minimum 1-1/4 inch in section, 4-1/8 inch depth; spaced at 12 inches on center; serrated surface.
- D. Side Rails: Aluminum extrusions; full penetration TIG welds.
- E. Handrails: 1-1/2 inch diameter aluminum pipe with end caps.

- F. Wall Attachment: Standard with manufacturer, compatible with wall and floor structure.
- G. Finish: Standard factory gray enamel.
- H. Product:
  1. Model 520 by O'Keeffe's Inc: [www.okeeffes.com](http://www.okeeffes.com).
  2. Substitutions: See Section 01 60 00 - Product Requirements.

## **2.02 WALL LADDER**

- A. Type: Fixed wall, vertical
- B. Rungs: Tubular aluminum extrusions, minimum 1-1/4 inch in section and 18 inch long; spaced at 12 inches on center.
- C. Side Rails: Two interlocking aluminum extrusions, minimum 1/8 inch wall thickness by 3 inch wide; stainless steel fasteners, full penetration TIG welds; clean, smooth and burr-free surfaces.
- D. Wall Attachment: Standard with manufacturer, compatible with wall and floor structure.
- E. Finish: Clear anodic.
- F. Product:
  1. Model 500 Heavy Duty Tubular Rail Ladder by O'Keeffe's Inc: [www.okeeffes.com](http://www.okeeffes.com).
  2. Substitutions: See Section 01 60 00 - Product Requirements.

## **2.03 WALL LADDER WITH EXTENSIONS**

- A. Type: Fixed wall, vertical, with extensions.
- B. Rungs: Tubular aluminum extrusions, minimum 1-1/4 inch in section and 18 inch long; spaced at 12 inches on center.
- C. Side Rails: Two interlocking aluminum extrusions, minimum 1/8 inch wall thickness by 3 inch wide; stainless steel fasteners, full penetration TIG welds; clean, smooth and burr-free surfaces.
- D. Wall Attachment: Standard with manufacturer, compatible with wall and floor structure.
- E. Finish: Clear anodic.
- F. Product:
  1. Model 504 Heavy Duty Tubular Rail Ladder by O'Keeffe's Inc: [www.okeeffes.com](http://www.okeeffes.com).
  2. Substitutions: See Section 01 60 00 - Product Requirements.

## **2.04 ACCESSORIES**

- A. Anchors: Stainless Steel, type and capacity to meet structural requirements.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify that field conditions are acceptable and are ready to receive work.

### **3.02 INSTALLATION**

- A. Install in accordance with manufacturer's instructions.
- B. Install ladder units plumb and level, accurately filled, free from distortion or defects.
- C. Do not cut components unless approved by manufacturer.
- D. Secure ladders floor/roof construction as appropriate. Do not attach ladders to roofed surfaces.

### **3.03 ERECTION 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**

**EXTERIOR METAL RAILINGS****PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Steel handrails at exterior stairs and ramps.
- B. Stainless steel handrails.

**1.02 RELATED REQUIREMENTS**

- A. Section 01 40 00 - Quality Requirements: Testing and inspection agency.
- B. Section 01 62 11 - Delegated Design.
- C. Section 03 30 00 - Cast-in-Place Concrete: Placement of anchors in concrete.
- D. Section 05 51 00 - Metal Stairs: Metal stairs.
- E. Section 09 90 00 - Painting and Coating: Powder coated finish.

**1.03 REFERENCE STANDARDS**

- A. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2012.
- B. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless; 2012.
- C. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2013.
- D. ASTM A 269 - Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Use; 2004.
- E. ASTM E935 - Standard Test Methods for Performance of Permanent Metal Railing Systems and Rails for Buildings; 2013.
- F. ASTM E985 - Standard Specification for Permanent Metal Railing Systems and Rails for Buildings; 2000 (Reapproved 2006).
- G. SSPC-Paint 15 - Steel Joist Shop Paint; 1999 (Ed. 2004).
- H. SSPC-Paint 20 - Zinc-Rich Primers (Type I, "Inorganic," and Type II, "Organic"); 2002 (Ed. 2004).

**1.04 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories.
  - 1. Include the design engineer's stamp or seal on each sheet of shop drawings.
- C. Delegated Design Data: As required by authorities having jurisdiction.
- D. Design Calculations: Submit design calculations prepared by Oregon registered engineer for all pre-engineered stairs, handrails and guardrails.
- E. Welders' Certificates.

**PART 2 PRODUCTS****2.01 RAILINGS - GENERAL REQUIREMENTS**

- A. Design, fabricate, and test railing assemblies in accordance with the most stringent requirements of ASTM E985 and applicable local code.

- B. Distributed Loads: Design railing assembly, wall rails, and attachments to resist distributed force of 75 pounds per linear foot applied to the top of the assembly and in any direction, without damage or permanent set. Test in accordance with ASTM E 935.
- C. Concentrated Loads: Design railing assembly, wall rails, and attachments to resist a concentrated force of 200 pounds applied at any point on the top of the assembly and in any direction, without damage or permanent set. Test in accordance with ASTM E 935.
- D. Allow for expansion and contraction of members and building movement without damage to connections or members.
- E. Dimensions: See drawings for configurations and heights.
- F. Provide anchors and other components as required to attach to structure, made of same materials as railing components unless otherwise indicated; where exposed fasteners are unavoidable provide flush countersunk fasteners.
- G. Provide slip-on non-weld mechanical fittings to join lengths, seal open ends, and conceal exposed mounting bolts and nuts, including but not limited to elbows, T-shapes, splice connectors, flanges, escutcheons, and wall brackets.

## **2.02 STEEL RAILING SYSTEM**

- A. Steel Plate: ASTM A 36.
- B. Steel Pipe: ASTM A 53/A 53M, Grade B Schedule 40, black finish.
- C. Stainless Steel Pipe: ASTM A 269, Type 304.
- D. Non-Weld Mechanical Fittings: Slip-on, galvanized malleable iron castings, for Schedule 40 pipe, with flush setscrews for tightening by standard hex wrench, no bolts or screw fasteners.
- E. Exposed Fasteners: No exposed bolts or screws.
- F. Galvanizing: In accordance with requirements of ASTM A123/A123M.
  - 1. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20, Type I - Inorganic.
- G. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.

## **2.03 FABRICATION**

- A. Accurately form components to suit specific project conditions and for proper connection to building structure.
- B. Fit and shop assemble components in largest practical sizes for delivery to site.
- C. Fabricate components with joints tightly fitted and secured.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify that field conditions are acceptable and are ready to receive work.

### **3.02 INSTALLATION**

- A. Install components plumb and level, accurately fitted, free from distortion or defects, with tight joints.
- B. Anchor railings securely to structure; coordinate location of wall backing.
- C. Conceal anchor bolts and screws whenever possible. Where not concealed, use flush countersunk fastenings.

**3.03 TOLERANCES**

- A. Maximum Variation From Plumb: 1/4 inch per floor level, non-cumulative.
- B. Maximum Offset From True Alignment: 1/4 inch.
- C. Maximum Out-of-Position: 1/4 inch.

**3.04 FIELD QUALITY CONTROL**

- A. An independent testing agency will perform field quality control tests, as specified in Section 01 40 00.

**END OF SECTION**

## PIPE AND TUBE RAILINGS

### PART 1 GENERAL

#### 1.01 SECTION INCLUDES

- A. Safety guardrail system.
- B. Self-closing gates.

#### 1.02 RELATED REQUIREMENTS

- A. Section 01 62 11 - Delegated Design.
- B. Section 05 51 00 - Metal Stairs and Railings: Pre-engineered metal stairs.

#### 1.03 REFERENCE STANDARDS

- A. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless; 2012.
- B. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes; 2013.
- C. ASTM E935 - Standard Test Methods for Performance of Permanent Metal Railing Systems and Rails for Buildings; 2013.
- D. ASTM E985 - Standard Specification for Permanent Metal Railing Systems and Rails for Buildings; 2000 (Reapproved 2006).

#### 1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Indicate profiles, sizes, connection attachments, anchorage, size and type of fasteners, and accessories.
- C. Delegated Design Data: As required by authorities having jurisdiction.

### PART 2 PRODUCTS

#### 2.01 MANUFACTURERS

- A. Handrails and Railings:
  1. Safety Rail Systems: [www.safetyrailsystems.com](http://www.safetyrailsystems.com).
  2. Kee Safety, Inc: [www.keesafety.com](http://www.keesafety.com).
  3. The Wagner Companies: [www.wagnercompanies.com](http://www.wagnercompanies.com).
  4. Substitutions: See Section 01 60 00 - Product Requirements.

#### 2.02 RAILINGS - GENERAL REQUIREMENTS

- A. Design, fabricate, and test railing assemblies in accordance with the most stringent requirements of ASTM E985 and applicable local code.
- B. Distributed Loads: Design railing assembly, wall rails, and attachments to resist distributed force of 75 pounds per linear foot applied to the top of the assembly and in any direction, without damage or permanent set. Test in accordance with ASTM E 935.
- C. Concentrated Loads: Design railing assembly, wall rails, and attachments to resist a concentrated force of 200 pounds applied at any point on the top of the assembly and in any direction, without damage or permanent set. Test in accordance with ASTM E 935.
- D. Dimensions: See drawings for configurations and heights.
  1. Wall Rails: 1-5/8 inches diameter, round.
  2. Intermediate Rails: 1-5/8 inches diameter, round.
  3. Posts: 1-5/8 inches diameter, round.

- E. Provide anchors and other components as required to attach to structure, made of same materials as railing components unless otherwise indicated; where exposed fasteners are unavoidable provide flush countersunk fasteners.
  1. For anchorage to stud walls, provide backing plates, for bolting anchors.
- F. Provide slip-on non-weld mechanical fittings to join lengths, seal open ends, and conceal exposed mounting bolts and nuts, including but not limited to elbows, T-shapes, splice connectors, flanges, escutcheons, and wall brackets.
- G. Provide self-closing gate and latch as indicated on Drawings.

### **2.03 STEEL RAILING SYSTEM**

- A. Steel Pipe: ASTM A 53/A 53M, Grade B Schedule 40, black finish.
- B. Non-Weld Mechanical Fittings: Slip-on, galvanized malleable iron castings, for Schedule 40 pipe, with flush setscrews for tightening by standard hex wrench, no bolts or screw fasteners.
- C. Exposed Fasteners: Flush countersunk screws or bolts; consistent with design of railing.
- D. Toe Guard: Steel.
- E. Shop Finish: Safety yellow factory finish.

### **2.04 FABRICATION**

- A. Accurately form components to suit specific project conditions and for proper connection to building structure.
- B. Fit and shop assemble components in largest practical sizes for delivery to site.
- C. Fabricate components with joints tightly fitted and secured.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify that field conditions are acceptable and are ready to receive work.

### **3.02 INSTALLATION**

- A. Install in accordance with manufacturer's instructions.
- B. Install components plumb and level, accurately fitted, free from distortion or defects, with tight joints.
- C. Anchor railings securely to structure.
- D. Conceal anchor bolts and screws whenever possible. Where not concealed, use flush countersunk fastenings.

### **3.03 TOLERANCES**

- A. Maximum Variation From Plumb: 1/4 inch per floor level, non-cumulative.
- B. Maximum Offset From True Alignment: 1/4 inch.
- C. Maximum Out-of-Position: 1/4 inch.

**END OF SECTION**



## ROUGH CARPENTRY

### PART 1 GENERAL

#### 1.01 SECTION INCLUDES

- A. Floor sheathing / underlayment.
- B. Wall sheathing.
- C. Roof sheathing.
- D. Roof-mounted curbs.
- E. Roofing nailers.
- F. Preservative treated wood materials.
- G. Fire retardant treated wood materials.
- H. Miscellaneous framing and sheathing.
- I. Wood nailers associated with roofing and flashing.
- J. Miscellaneous wood nailers, furring, and grounds.

#### 1.02 RELATED REQUIREMENTS

- A. Section 07 21 00 - Thermal Insulation: Composite polyisocyanurate board insulation faced with plywood.
- B. Section 07 54 00 - Thermoplastic Membrane Roofing.

#### 1.03 REFERENCE STANDARDS

- A. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2009.
- B. ASTM D2898 - Standard Test Methods for Accelerated Weathering of Fire-Retardant-Treated Wood for Fire Testing; 2010.
- C. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2014.
- D. AWPA U1 - Use Category System: User Specification for Treated Wood; American Wood Protection Association; 2012.
- E. PS 1 - Structural Plywood; 2009.
- F. PS 2 - Performance Standard for Wood-Based Structural-Use Panels; National Institute of Standards and Technology, U.S. Department of Commerce; 2010.
- G. PS 20 - American Softwood Lumber Standard; National Institute of Standards and Technology, Department of Commerce; 2010.

#### 1.04 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.
- B. Fire-Retardant Treated Wood: Mark each piece of wood with producer's stamp indicating compliance with specified requirements.

#### 1.05 DELIVERY, STORAGE, AND HANDLING

- A. General: Cover wood products to protect against moisture. Support stacked products to prevent deformation and to allow air circulation.

- B. Fire Retardant Treated Wood: Prevent exposure to precipitation during shipping, storage, or installation.

## **PART 2 PRODUCTS**

### **2.01 GENERAL REQUIREMENTS**

- A. Dimension Lumber: Comply with PS 20 and requirements of specified grading agencies.
  1. If no species is specified, provide any species graded by the agency specified; if no grading agency is specified, provide lumber graded by any grading agency meeting the specified requirements.
  2. Grading Agency: Any grading agency whose rules are approved by the Board of Review, American Lumber Standard Committee ([www.alsc.org](http://www.alsc.org)) and who provides grading service for the species and grade specified; provide lumber stamped with grade mark unless otherwise indicated.
- B. Lumber fabricated from old growth timber is not permitted.

### **2.02 DIMENSION LUMBER**

- A. Sizes: Nominal sizes as indicated on drawings, S4S.
- B. Moisture Content: S-dry or MC19.
- C. Miscellaneous Framing, Blocking, Nailers, Grounds, and Furring:
  1. Lumber: S4S, No. 2 or Standard Grade.
  2. Boards: Standard or No. 3.
- D. Lumber to Receive Preservative Pressure Treatment:
  1. Species: Hem-fir.
  2. Grade: No. 2.

### **2.03 CONSTRUCTION PANELS**

- A. Subfloor/Underlayment Combination: PS 1 or PS 2, rated Single Floor.
  1. Bond Classification: Exterior.
  2. Span Rating: As indicated on Drawings.
  3. Performance Category: As indicated on Drawings.
  4. Edges: Tongue and groove.
- B. Subflooring: APA Floor Sheathing; plywood.
  1. Bond Classification: Exterior.
  2. Span Rating: As indicated on Drawings.
  3. Thickness: As indicated on Drawings.
- C. Underlayment: APA Underlayment; plywood, Exposure 2, 1/2 inch thick; fully sanded face; fire-retardant treated.
- D. Roof Sheathing: PS1 or PS 2.
  1. Grade: Structural 1 Sheathing.
  2. Bond Classification: Exposure 1.
  3. Performance Category: As indicated on Drawings.
  4. Span Rating: As indicated on Drawings.
  5. Edges: Tongue and groove.
- E. Wall Sheathing: PS 1 or PS 2 type.
  1. Bond Classification: Exterior.
  2. Grade: Structural I Sheathing.
  3. Span Rating: As indicated on Drawings.
  4. Performance Category: As indicated on Drawings.
  5. Edge Profile: Square edge.

**2.04 ACCESSORIES**

- A. Fasteners and Anchors:
  1. Metal and Finish: Hot-dipped galvanized steel per ASTM A 153/A 153M for high humidity and preservative-treated wood locations, unfinished steel elsewhere.
  2. Drywall Screws: Bugle head, hardened steel, power driven type, length three times thickness of sheathing.
  3. Powder Actuated Anchors: At structural core brick masonry as indicated on Drawings.
- B. Prefabricated Connectors and Hangers: Hot dipped galvanized steel, sized to suit framing conditions.
  1. Specific Products: As indicated on Drawings.
  2. Manufacturers:
    - a. Basis of Design: Simpson Strong-Tie: [www.strongtie.com](http://www.strongtie.com).
    - b. Substitutions: See Section 01 60 00 - Product Requirements.
- C. Glue/Adhesive: Waterproof, water base, air cure type, cartridge dispensed.

**2.05 FACTORY WOOD TREATMENT**

- A. Treated Lumber and Plywood: Comply with requirements of AWPA U1 - Use Category System for wood treatments determined by use categories, expected service conditions, and specific applications.
  1. Fire-Retardant Treated Wood: Mark each piece of wood with producer's stamp indicating compliance with specified requirements.
  2. Preservative-Treated Wood: Provide lumber and plywood marked or stamped by an ALSC-accredited testing agency, certifying level and type of treatment in accordance with AWPA standards.
- B. Fire Retardant Treatment at Exterior Wall Assemblies and as indicated on Drawings:
  1. Exterior Type: AWPA U1, Category UCFB, Commodity Specification H, chemically treated and pressure impregnated; capable of providing a maximum flame spread rating of 25 when tested in accordance with ASTM E84, with no evidence of significant combustion when test is extended for an additional 20 minutes both before and after accelerated weathering test performed in accordance with ASTM D2898.
    - a. Kiln dry wood after treatment to a maximum moisture content of 19 percent for lumber and 15 percent for plywood.
    - b. Treat all exterior rough carpentry items.
- C. Preservative Pressure Treatment of Lumber Above Grade: AWPA U1, Use Category UC3B, Commodity Specification A using waterborne preservative to 0.25 lb/cu ft retention.
  1. Kiln dry lumber after treatment to maximum moisture content of 19 percent.
  2. Treat lumber in contact with roofing, flashing, or waterproofing.
  3. Treat lumber in contact with masonry or concrete.

**PART 3 EXECUTION****3.01 INSTALLATION - GENERAL**

- A. Select material sizes to minimize waste.
- B. Reuse scrap to the greatest extent possible; clearly separate scrap for use on site as accessory components, including: shims, bracing, and blocking.
- C. Where treated wood is used on interior, provide temporary ventilation during and immediately after installation sufficient to remove indoor air contaminants.

**3.02 FRAMING INSTALLATION**

- A. Select material sizes to minimize waste.

- B. Reuse scrap to the greatest extent possible; clearly separate scrap for use on site as accessory components, including: shims, bracing, and blocking.

### **3.03 BLOCKING, NAILERS, AND SUPPORTS**

- A. Provide framing and blocking members as indicated or as required to support finishes, fixtures, specialty items, and trim.

### **3.04 ROOF EDGE AND WALL COPING NAILERS**

- A. Roof Edge: Install treated wood nailers at perimeter of roof areas and perimeter of penetrations:
  - 1. Use multiple layers to achieve height to match thickness of rigid insulation.
  - 2. Secure to metal decking with screws spaced 12 inches on center, staggered 1/3 of nailer width, and installed within 6 inches of each nailer end. Install two screws at each nailer end; install in accordance with Factory Mutual Prevention Data Sheet 1-49.

### **3.05 INSTALLATION OF CONSTRUCTION PANELS**

- A. Subflooring/Underlayment Combination: Glue and nail to framing; staples are not permitted.
- B. Subflooring: Nail to framing; staples are not permitted.
- C. Underlayment: Secure to subflooring with nails .
- D. Roof Sheathing: Secure panels with long dimension perpendicular to framing members, with ends staggered and over firm bearing.
  - 1. At long edges use sheathing clips where joints occur between roof framing members.
  - 2. Nail panels to framing; staples are not permitted.
- E. Wall Sheathing: Secure with long dimension perpendicular to wall studs, with ends over firm bearing and staggered, using nails, screws, or staples.

### **3.06 TOLERANCES**

- A. Framing Members: 1/4 inch from true position, maximum.
- B. Variation from Plane (Other than Floors): 1/4 inch in 10 feet maximum, and 1/4 inch in 30 feet maximum.

**END OF SECTION**

**PRE-FABRICATED PLYWOOD I JOISTS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Wood chord and plywood or particleboard web joists for floor framing;
- B. Bridging, bracing and anchorage;
- C. Framing for openings
- D. Preservative treatment of wood.

**1.02 RELATED REQUIREMENTS**

- A. Section 01 62 11 - Delegated Design.
- B. Section 06 10 00 – Rough Carpentry
- C. Section 06 17 36 – Metal Web Wood Joists

**1.03 REFERENCE STANDARDS**

- A. APA – Engineered Wood Association: APA/EWA PSI 400 – Performance Standard for Wood I Joists.
- B. American Society for Testing and Materials: ASTM D2559 – Standard Specification for Adhesives for Structural Laminated Wood Products for Use Under Exterior (Wet Use) Exposure Conditions.
- C. American Wood-Preservers' Association: AWPA C1 – All Timber Products – Preservative Treatment by Pressure Process.
- D. National Evaluation Service (NES): Report No. NER-200.

**1.04 SUBMITTALS**

- A. Shop Drawings: Provide shop drawings which indicate sizes and spacings of joists, fastener description and spacings, loads, framed openings, stamped by a professional engineer licensed in the State of Oregon. Submit joist configurations, bearing and anchor/hanger details, bridging and bracing.
- B. Design Calculations: Submit design calculations that conform to the dimensions and design loads shown in the drawings, stamped by a professional engineer licensed in the State of Oregon.
- C. Evaluation reports, from ICC-ES.

**1.05 DESIGN REQUIREMENTS**

- A. Design members and their connections to supporting structure for the more stringent of the applied loads and deflection limitations shown on the drawings or as required by the applicable building code.
- B. Where joist size and spacing is indicated on the drawings, products with a lesser strength or stiffness (EI) shall not be substituted nor shall equivalent products at a larger spacing.

**1.06 QUALITY ASSURANCE**

- A. Perform Work in accordance with the following:
  - 1. I-Joist Quality Assurance Agency.
  - 2. Manufacturers Requirements.

3. National Evaluation Services (NES) Report NO. NER-200.
4. APA Design/Construction Guide: I Joists for Residential Floors (Form x 710).

#### **1.07 QUALIFICATIONS**

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years experience.
- B. Design joists and associated components under direct supervision of a Professional Engineer experienced in design of this Work and licensed in the State of Oregon.

#### **1.08 DELIVERY, STORAGE, AND HANDLING**

- A. Division 1 Section – Product Requirements: Product storage and handling requirements.
- B. Protect structural components from warping or distortion by stacking in vertical position, braced to resist movement. Protect from weather by covering with waterproofing sheeting, securely anchored. Provide for air circulation around stacks and under coverings.

### **PART 2 PRODUCTS**

#### **2.01 MANUFACTURERS**

- A. Manufacturers:
  1. RedBuilt LLC. [www.redbuilt.com](http://www.redbuilt.com)
  2. Substitutions: See Section 01 60 00 - Product Requirements.

#### **2.02 ACCESSORIES**

- A. Adhesive: ASTM D2559.
- B. Wood Blocking, Support Members and Framing for Openings, beveled plates.
- C. Fasteners:
  1. Fasteners: Hot dipped galvanized steel for high humidity and treated wood locations, unfinished steel elsewhere.

#### **2.03 FABRICATION**

- A. Fabricate joists to achieve structural requirements specified.
- B. Brace members for support during transit.
- C. Fabricate to achieve minimum end bearing per manufacturer's requirements.
- D. Frame special sized openings in web as indicated on Drawings.

#### **2.04 FACTORY WOOD TREATMENT**

- A. Wood Preservative (Pressure Treatment): AWWPA Treatment C1 using water borne preservative with 0.25 lbs/cu ft retention.

#### **2.05 MATERIALS**

- A. Flange Material: Structural composite lumber made from wood veneers with grain primarily parallel to member lengths, evaluated and monitored according to ASTM D 5456 and manufactured with an exterior-type adhesive complying with ASTM D 2559.
- B. Web Material: Either oriented strand board or plywood, complying with DOC PS 1 or DOC PS 2, Exposure 1.
- C. Structural Properties: Provide units matching the depths indicated and with design strength and stiffness (EI) values not less than those indicated.

- D. Provide units complying with APA PRI-400, factory marked with APA trademark indicating nominal joist depth, joist class, span ratings, mill identification, and compliance with APA standard.

**2.06 IDENTIFICATION**

- A. Each of the joists shall be factory marked with APA trademark indicating nominal joist depth, joist class, span ratings, mill identification, and compliance with APA standard.

**PART 3 EXECUTION**

**3.01 EXAMINATION**

- A. Division 1 Section – Administrative Requirements: Coordination and project conditions.
- B. Verify supports and openings are ready to receive joists.

**3.02 PREPARATION**

- A. Coordinate placement and bearing and support items.

**3.03 ERECTION**

- A. Install products to comply with manufacturer's written instructions.
- B. Set structural members level and plumb, in correct position.
- C. Install metal framing anchors to comply with manufacturer's written instructions. Install fasteners in each intended fastener hole.
- D. Make provisions for erection loads, and for sufficient temporary bracing to maintain structure plumb and in alignment until completion of erection and installation of permanent bracing.
- E. Do not field cut or alter structural members without approval of Architect/Engineer.
- F. Do not splice members between supports unless otherwise indicated.
- G. Place headers and supports to frame openings.
- H. Frame openings between joists with lumber and provide blocking and framing as required to support facing materials, fixtures, specialty items and trim in accordance with Section 06 10 00 - Rough Carpentry.
- I. Coordinate placement of sheathing with work of this Section.

**3.04 STORAGE AND HANDLING**

- A. Joists shall be stored in a vertical position and protected from the weather.

**3.05 ERECTION TOLERANCES**

- A. Division 1 Section – Quality Requirements: Tolerances.
- B. Framing Members: 1/2" maximum, from indicated position.

**END OF SECTION**

## **METAL-WEB WOOD JOISTS**

### **PART 1 GENERAL**

#### **1.01 SECTION INCLUDES**

- A. Wood chord metals joists for floor framing.
- B. Bridging, bracing and anchorage.
- C. Framing for openings.
- D. Preservative treatment of wood.

#### **1.02 RELATED REQUIREMENTS**

- A. Section 01 62 11 - Delegated Design.
- B. Section 06 10 00 – Rough Carpentry.
- C. Section 06 17 33 - Pre-Fabricated Wood I-Joists.

#### **1.03 REFERENCE STANDARDS**

- A. American Wood-Preservers' Association: AWPA C1 – All Timber Products – Preservative Treatment by Pressure Process.

#### **1.04 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Indicate size and spacing of joists, fastener description and spacings, loads, framed openings stamped by a professional engineer licensed in the State of Oregon. Submit joist configurations, bearing and anchor/hanger details, bridging and bracing.
- C. Design Calculations: Submit design calculations that conform to the dimensions and design loads shown in the drawings, stamped by a professional engineer licensed in the State of Oregon.

#### **1.05 DESIGN REQUIREMENTS**

- A. Design members and their connections to supporting structure for the more stringent of the applied loads and deflection limitations shown on the drawings or as required by the applicable building code.
- B. Where joist size and spacing is indicated on the drawings, products with a lesser strength or stiffness (EI) shall not be substituted nor shall equivalent products at a larger spacing.

#### **1.06 QUALITY ASSURANCE**

- A. Perform Work in accordance with the following:
  - 1. I-Joist Quality Assurance Agency.
  - 2. Manufacturers Requirements.
  - 3. National Evaluation Services (NES) Report NO. NER-148.
- B. Quality Standard: Comply with AITC A190.1, "Structural Glued Laminated Timber."

#### **1.07 QUALIFICATIONS**

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years experience.



- B. Design joists and associated components under direct supervision of Professional Engineer experienced in design of this Work and licensed in the State of Oregon.

**1.08 DELIVERY, STORAGE, AND HANDLING**

- A. Division 1 Section – Product Requirements: Product storage and handling requirements.
- B. Protect joists from warping or other distortion by stacking in vertical position, braced to resist movement under protection from weather.

**PART 2 PRODUCTS**

**2.01 MANUFACTURERS**

- A. Manufacturers:
  - 1. RedBuilt, LLC
  - 2. Substitutions: Section 01 60 00 – Product Requirements.

**2.02 MATERIALS**

- A. Materials shall comply with ICC ES Report No. ESR-1774. Chord members, web members, connecting pins and bearing hardware/attachments shall be of material and size as required by design.

**2.03 ACCESSORIES**

- A. Wood Blocking, Support Members, Framing for Openings, beveled plates.

**2.04 FABRICATION**

- A. Fabricate joists to achieve structural requirements specified.
- B. Brace members for support during transit.
- C. Fabricate to achieve minimum end bearing per manufacturer's requirements.
- D. Frame special sized openings in web as indicated on Drawings.

**2.05 TOLERANCES**

- A. Length bearing to bearing:
  - 1. For trusses up to 30 feet: +/- 1/8".
  - 2. For trusses greater than 30 feet: +/- 1/4".
  - 3. Depth: +/- 1/8".

**2.06 IDENTIFICATION**

- A. Each truss joist shall be identified by a stamp indicating the truss series, ICC ES evaluation report number, manufacturer's name, plant number, date of fabrication, and the independent inspection agency's logo.

**PART 3 EXECUTION**

**3.01 EXAMINATION**

- A. Division 1 Section – Administrative Requirements: Coordination and project conditions.
- B. Verify supports and openings are ready to receive joists.

**3.02 PREPARATION**

- A. Coordinate placement and bearing and support items.

**3.03 ERECTION**

- A. Set members level and plumb, in correct position.

- B. Make provisions for erection loads, and for sufficient temporary bracing to maintain structure plumb and in alignment until completion of erection and installation of permanent bracing.
- C. Do not field cut or alter structural members without approval of Architect/Engineer.
- D. Place headers and supports to frame openings.
- E. Frame openings between joists with lumber in accordance with Division 6 Section "Rough Carpentry".
- F. Coordinate placement of sheathing with work of this Section.
- G. After erection, touch-up damaged galvanized surfaces with primer consistent with shop coat.
- H. Prior to enclosing joists, the contractor shall give notification to the manufacturer representative to provide an opportunity for review of the installation.

**3.04 ERECTION TOLERANCES**

- A. Division 1 Section – Quality Requirements: Tolerances.
- B. Framing Members: 1/2" maximum, from indicated position.

**END OF SECTION**

**GLUED-LAMINATED CONSTRUCTION****PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Glue laminated wood beams.
- B. Fire retardant treatment of wood.
- C. Steel hardware and attachment brackets.

**1.02 RELATED REQUIREMENTS**

- A. Section 06 10 00 - Rough Carpentry: Wood framing, wood sheathing and blocking.
- B. Section 09 90 00 - Painting and Coating: Field finishing of exposed members.

**1.03 REFERENCE STANDARDS**

- A. AITC 117 - Standard Specifications for Structural Glued Laminated Timber of Softwood Species; American Institute of Timber Construction; 2010.
- B. AITC A190.1 - American National Standard for Wood Products - Structural Glued Laminated Timber; American Institute of Timber Construction; 2007.
- C. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2012.
- D. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2013.
- E. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2009.
- F. ASTM A325 - Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength; 2010.
- G. ASTM A325M - Standard Specification for Structural Bolts, Steel, Heat Treated 830 MPa Tensile Strength (Metric); 2013.
- H. ASTM A563 - Standard Specification for Carbon and Alloy Steel Nuts; 2007a (Reapproved 2014).
- I. ASTM A563M - Standard Specification for Carbon and Alloy Steel Nuts [Metric]; 2007.
- J. ASTM D2559 - Standard Specification for Adhesives for Bonded Structural Wood Products for Use Under Exterior Exposure Conditions; 2012a.
- K. ASTM D2898 - Standard Test Methods for Accelerated Weathering of Fire-Retardant-Treated Wood for Fire Testing; 2010.
- L. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2014.
- M. AWPA U1 - Use Category System: User Specification for Treated Wood; American Wood-Preservers' Association; 2012.
- N. WWPA G-5 - Western Lumber Grading Rules; Western Wood Products Association; 2011.

**1.04 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide technical data on wood preservative materials, application technique and resultant performance information.
- C. Shop Drawings: Indicate framing system, sizes and spacing of members, loads and cambers, bearing and anchor details, bridging and bracing, framed openings .

**1.05 QUALITY ASSURANCE**

- A. Manufacturer/Fabricator Qualifications: Company specializing in manufacture of glue laminated structural units with three years of documented experience, and certified by AITC in accordance with AITC A190.1.

**1.06 DELIVERY, STORAGE, AND HANDLING**

- A. Protect members to AITC requirements:
  - 1. Exposed Members: Individually wrapped.
  - 2. Concealed Members: Bundle wrapped.
- B. Leave individual wrapping in place until finishing occurs.
- C. Fire Retardant Treated Wood: Prevent exposure to precipitation during shipping, storage, or installation.

**PART 2 PRODUCTS**

**2.01 GLUED-LAMINATED UNITS**

- A. Glued-Laminated Unit: Fabricate in accordance with AITC grade(s) as noted under Fabrication.
  - 1. Verify dimensions and site conditions prior to fabrication.
  - 2. Cut and fit members accurately to length to achieve tight joint fit.
  - 3. Fabricate member with camber built in.
  - 4. Do not splice or join members in locations other than those indicated without permission.
  - 5. Fabricate steel hardware and connections with joints neatly fitted, welded, and ground smooth.

**2.02 MATERIALS**

- A. Lumber: Douglas Fir lumber conforming to WWPA grading rules with 12 percent maximum moisture content before fabrication. Design for the following values:
  - 1. Refer to General Structural Notes on Drawings.
- B. Steel Connections and Brackets: ASTM A36/A36M weldable quality, galvanize per ASTM A123/A123M.
- C. Anchor Bolts: ASTM A325 (ASTM A325M) Type 1 heavy hex high strength bolts and ASTM A563 (A 563M) nuts; hot-dip galvanized to meet requirements of ASTM A153/A153M, matching washers.
- D. Laminating Adhesive: Tested for wet/exterior service in accordance with ASTM D2559.

**2.03 WOOD TREATMENT**

- A. Fire Retardant Treatment:
  - 1. Exterior Type: AWPA U1 Use Category UCFB, Commodity Specification H, chemically treated and pressure impregnated; 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 30 minutes both before and after accelerated weathering test performed in accordance with ASTM D2898.
    - a. Kiln dry wood after treatment to a maximum moisture content of 19 percent prior to lamination.
    - b. Fire retardant treat members located in exterior wall construction.

**2.04 FABRICATION**

- A. Fabricate glue laminated structural members in accordance with AITC grades:
  - 1. Exposed Members: Premium.
  - 2. Concealed Members: Industrial.
- B. Verify dimensions and site conditions prior to fabrication.

- C. Cut and fit members accurately to length to achieve tight joint fit.
- D. Fabricate member with camber built in.
- E. Do not splice or join members in locations other than those indicated without permission.
- F. Fabricate steel hardware and connections with joints neatly fitted, welded, and ground smooth.

**PART 3 EXECUTION**

**3.01 EXAMINATION**

- A. Verify that supports are ready to receive units.
- B. Verify sufficient end bearing area.

**3.02 PREPARATION**

- A. Coordinate placement of bearing items.

**3.03 ERECTION**

- A. Lift members using protective straps to prevent visible damage.
- B. Set structural members level and plumb, in correct positions or sloped where indicated.
- C. Provide temporary bracing and anchorage to hold members in place until permanently secured.
- D. Fit members together accurately without trimming, cutting, splicing, or other unauthorized modification.

**3.04 TOLERANCES**

- A. Framing Members: 1/2 inch maximum from true position.

**END OF SECTION**

**FINISH CARPENTRY****PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Finish carpentry items.
- B. Window sills (Plastic laminate faced plywood).
- C. Hardware and attachment accessories.

**1.02 RELATED REQUIREMENTS**

- A. Section 05 40 00 - Cold-Formed Metal Framing: Exterior wall framing.
- B. Section 06 40 00 - Architectural Woodwork: Wood wall panels, wood ceiling panels, wood door and relite frames.
- C. Section 09 21 16 - Gypsum Board Assemblies: Interior non-bearing wall framing, grounds, and concealed blocking.
- D. Section 09 90 00 - Painting and Coating: Painting and finishing of finish carpentry items.

**1.03 REFERENCE STANDARDS**

- A. NEMA LD 3 - High-Pressure Decorative Laminates; National Electrical Manufacturers Association; 2005.
- B. PS 1 - Structural Plywood; 2009.

**1.04 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements for submittal procedures.
- B. Shop Drawings: Indicate materials, component profiles, fastening methods, jointing details, accessories, to a minimum scale of 1-1/2 inch to 1 ft.
- C. Samples: Submit two samples of wood trim 6 inch long.

**1.05 QUALITY ASSURANCE**

- A. Fabricator Qualifications: Company specializing in fabricating the products specified in this section with minimum five years of documented experience.

**1.06 DELIVERY, STORAGE, AND HANDLING**

- A. Protect work from moisture damage.

**1.07 PROJECT CONDITIONS**

- A. Sequence installation to ensure utility connections are achieved in an orderly and expeditious manner.

**PART 2 PRODUCTS****2.01 WOOD-BASED COMPONENTS**

- A. Wood fabricated from old growth timber is not permitted.

**2.02 SHEET MATERIALS**

- A. Softwood Plywood Not Exposed to View: Any face species, veneer core; PS 1 Grade A-B; glue type as recommended for application; 48 x 96 inch sheet size.

**2.03 PLASTIC LAMINATE MATERIALS**

- A. Plastic Laminate: NEMA LD 3, HGS ; satin finish; Crisp Linen 4942-38 manufactured by Wilsonart.
- B. Laminate Adhesive: Type recommended by laminate manufacturer to suit application; not containing formaldehyde or other volatile organic compounds.

**2.04 FASTENINGS**

- A. Fasteners: Of size and type to suit application; galvanized finish in concealed locations and stainless finish in exposed locations.

**2.05 FABRICATION**

- A. Shop assemble work for delivery to site, permitting passage through building openings.
- B. Cap exposed plastic laminate finish edges with material of same finish and pattern.
- C. When necessary to cut and fit on site, provide materials with ample allowance for cutting. Provide trim for scribing and site cutting.
- D. Apply plastic laminate finish in full uninterrupted sheets consistent with manufactured sizes. Fit corners and joints hairline; secure with concealed fasteners.

**PART 3 EXECUTION****3.01 EXAMINATION**

- A. Verify adequacy of backing and support framing.

**3.02 INSTALLATION**

- A. Set and secure materials and components in place, plumb and level.
- B. Carefully scribe work abutting other components, with maximum gaps of 1/32 inch. Do not use additional overlay trim to conceal larger gaps.

**3.03 TOLERANCES**

- A. Maximum Variation from True Position: 1/16 inch.
- B. Maximum Offset from True Alignment with Abutting Materials: 1/32 inch.

**END OF SECTION**

**ARCHITECTURAL WOODWORK****PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Wood veneer wall paneling.
- B. Wood veneer perforated wall paneling.
- C. Wood veneer perforated ceiling panels.
- D. Solid wood trim.

**1.02 RELATED SECTIONS**

- A. Section 06 20 00 - Finish Carpentry: Window sills.
- B. Section 06 41 00 - Architectural Wood Casework: Wood veneer faced casework; plastic laminate faced casework.
- C. Section 08 14 16 - Flush Wood Doors: Doors.
- D. Section 08 80 00 - Glazing: Glass.
- E. Section 09 21 16 - Gypsum Board Assemblies: Furring and acoustical insulation materials.
- F. Section 09 22 26 - Suspension Systems: Support system for wood panel ceilings.
- G. Section 09 90 00 - Painting and Coating: Site finishing of wood door and relite frames.
- H. Section 10 14 00 - Signage.

**1.03 REFERENCES**

- A. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2005.
- B. AWI/AWMAC (QSI) - Architectural Woodwork Standards; Architectural Woodwork Institute and Architectural Woodwork Manufacturers Association of Canada; Woodwork Institute; 2009.
- C. PS 1 - Construction and Industrial Plywood; National Institute of Standards and Technology (Department of Commerce); 1995.
- D. PS 20 - American Softwood Lumber Standard; National Institute of Standards and Technology (Department of Commerce); 2005.

**1.04 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings, Paneling: Indicate materials, surface graining elevations of sheet paneling, fastening methods and layout, joining methods, and interruptions to other work, to a minimum scale of 1-1/2 inch to 1 ft. Include plan of panel number sequencing.
- C. Shop Drawings, Casework: Indicate materials, component profiles and elevations, assembly methods, joint details, fastening methods, accessory listings, hardware locations and schedule of finishes.
- D. Product Data: Provide data on fire retardant treatment materials and application instructions.
- E. Samples: Submit two samples of finished plywood, 12 x 12 inch in size, illustrating wood grain and specified finish.
- F. Samples: Submit two samples of wood trim, 12 inch long.



**1.05 QUALITY ASSURANCE**

- A. Fabricator: Company specializing in fabricating the products specified in this section with minimum three years of documented experience.

**1.06 DELIVERY, STORAGE, AND HANDLING**

- A. Protect work from moisture damage.
- B. Do not deliver wood materials to project site until building is fully enclosed and interior temperature and humidity are in accordance with recommendations of AWI Quality Standards Illustrated.

**1.07 PROJECT CONDITIONS**

- A. Verify that field measurements are as indicated.
- B. Coordinate the work with electrical rough-in, installation of associated and adjacent components .

**PART 2 PRODUCTS****2.01 WOOD-BASED MATERIALS - GENERAL**

- A. Wood fabricated from old growth timber is not permitted.

**2.02 LUMBER MATERIALS**

- A. Softwood Lumber: NIST PS 20; Graded in accordance with AWI/AWMAC Quality Standards Illustrated, Economy quality; Douglas fir species, maximum moisture content of 6 percent; with mixed grain .

**2.03 SHEET MATERIALS**

- A. Softwood Plywood: PS 1 Grade A-A; Graded in accordance with AWI/AWMAC Quality Standards Illustrated, Premium quality; veneer core; Douglas fir face species, rotary cut; of grain quality suitable for transparent finish; 48 x 96 inch sheet size; 3/4 inch thickness.
- B. Softwood Faced Hardwood Plywood (ApplePly): HPVA HP-1 Grade A-A; uniform laminations of solid grade Birch; PS 1 Grade A-A; Douglas fir face species, rotary cut; of grain quality suitable for transparent finish; 48 x 96 inch sheet size; 3/4 inch thickness.
  1. ApplePly by States Industries LLC: [www.appleply.com](http://www.appleply.com).
  2. Substitutions: See Section 01 60 00 - Product Requirements.

**2.04 ADHESIVES AND FASTENERS**

- A. Adhesives: Type suitable for intended purpose, complying with applicable air quality regulations.
- B. Fasteners: Of size and type to suit application; galvanized finish in concealed locations and stainless steel or chrome plated finish in exposed locations.

**2.05 ACCESSORIES**

- A. Lumber for Shimming, Blocking, and Backing: Softwood lumber of Douglas fir species.
- B. Wood Filler: Tinted to match surface finish color.
- C. Adhesive: Type recommended by fabricator to suit application.
- D. Fasteners: Size and type to suit application.
- E. Furring: Z-furring and hat-channels as specified in Section 09 21 16 - Gypsum Board Assemblies.
- F. Acoustical Insulation: Specified in Section 09 21 16 - Gypsum Board Assemblies.
- G. Skrim: Polyethylene sheeting, black color.

**2.06 WOOD TREATMENT PROCESSES**

- A. Fire Retardant Treatment (FR-S Type) for Lumber: Chemically treated and pressure impregnated; capable of providing flame spread index of 25, maximum, and smoke developed index of 450, maximum, when tested in accordance with ASTM E 84.
  1. Flame Control No. 130 manufactured by Flame Control Coatings, LLC:  
www.flamecontrol.com.
  2. Substitutions: See Section 01 60 00 - Product Requirements.

**2.07 SHOP TREATMENT OF WOOD MATERIALS**

- A. Provide UL approved identification on fire retardant treated material.
- B. Deliver fire retardant treated materials cut to required sizes. Minimize field cutting.
- C. Redry wood after pressure treatment to maximum 7 percent moisture content.

**2.08 FABRICATION - PANELS**

- A. Fabricate to AWI/AWMAC Architectural Woodwork Standards Premium quality, of Flush design.
- B. Fabricate panels with book matching between adjacent leaves. Center match panels on each elevation.
- C. At panels more than one leaf high, fabricate with architectural end matching.
- D. Shop prepare and identify panels for grain matching during site erection.
- E. Perforated Wood Veneer Panels: Perforation size and pattern as indicated on Drawings.
- F. Prepare panels for delivery to site, permitting passage through building openings.
- G. Finish exposed edges of panels as specified by grade requirements.
- H. When necessary to cut and fit on site, provide materials with ample allowance for cutting and scribing.

**2.09 FABRICATION - OTHER ITEMS**

- A. Fabricate to AWI/AWMAC Architectural Woodwork Standards Premium quality.
- B. Shop assemble work for delivery to site, permitting passage through building openings.
- C. Fit exposed sheet material edges with 3/8 inch matching hardwood edging. Use one piece for full length only.
- D. When necessary to cut and fit on site, provide materials with ample allowance for cutting. Provide trim for scribing and site cutting.
- E. When necessary to cut and fit on site, provide materials with ample clearance for cutting. Provide trim for scribing and site cutting.
- F. Kerf concealed back of thick trim items to prevent cupping.
- G. Sand work smooth, ready for finishing.
- H. Install skim on back side of perforated wood panels.

**2.10 SHOP FINISH - WALL AND CEILING PANELS**

- A. Finish work in accordance with AWI/AWMAC Architectural Woodwork Standards, Section 5 - Finishing: System 12, Polyurethane, Water Based; matt finish.

**PART 3 EXECUTION**

**3.01 EXAMINATION**

- A. Verify adequacy of backing and support framing.
- B. Verify mechanical, electrical, and building items affecting work of this section are placed and ready to receive this work.

**3.02 INSTALLATION**

- A. Install work in accordance with requirements of AWI/AWMAC Architectural Woodwork Standards for specified grade.
- B. Do not begin installation until wood materials have been fully acclimated to interior conditions as recommended by AWI/AWMAC Architectural Woodwork Standards.
- C. Set and secure materials and components in place, plumb and level, using concealed fasteners wherever possible.
- D. Where necessary to cut and fit on site, scribe work abutting other components. Do not use additional overlay trim to conceal gaps.

**3.03 ERECTION TOLERANCES**

- A. Maximum Variation from True Position: 1/16 inch.
- B. Maximum Offset from True Alignment with Abutting Materials: 1/32 inch.

**END OF SECTION**

**ARCHITECTURAL WOOD CASEWORK****PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Specially fabricated veneer faced cabinet units.
- B. Custom display cases.
- C. Custom media desk (Wood veneer faced casework with solid surfacing countertop).
- D. Custom reception desk (Wood veneer faced casework with solid surfacing countertop).
- E. Custom library shelving.
- F. Countertops.
- G. Cabinet hardware.
- H. Factory finishing.
- I. Preparation for installing utilities.

**1.02 RELATED REQUIREMENTS**

- A. Section 06 20 00 - Finish Carpentry.
- B. Section 06 40 00 - Architectural Woodwork.
- C. Section 08 80 00 - Glazing: Glazing work to be coordinated with casework.
- D. Section 09 21 16 - Gypsum Board Assemblies: Metal framing and backing.
- E. Section 12 51 18 - Moveable Casework.

**1.03 REFERENCE STANDARDS**

- A. ANSI A135.4 - American National Standard for Basic Hardboard; 2012.
- B. APA - American Plywood Association, Grading Rules,
- C. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards; 2009.
- D. BHMA A156.9 - American National Standard for Cabinet Hardware; Builders Hardware Manufacturers Association; 2010 (ANSI/BHMA A156.9).
- E. NEMA LD 3 - High-Pressure Decorative Laminates; National Electrical Manufacturers Association; 2005.
- F. PS 1 - Structural Plywood; 2009.
- G. PS 20 - American Softwood Lumber Standard; National Institute of Standards and Technology (Department of Commerce); 2010.

**1.04 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Indicate materials, component profiles and elevations, assembly methods, joint details, fastening methods, accessory listings, hardware location and schedule of finishes.
- C. Product Data: Provide data for hardware accessories.
- D. Samples: Submit actual samples of architectural cabinet construction, minimum 12 inches square, illustrating proposed cabinet, countertop, and shelf unit substrate and finish.
- E. Samples: Submit actual sample items of proposed pulls, hinges, shelf standards, and locksets, demonstrating hardware design, quality, and finish.

**1.05 QUALITY ASSURANCE**

- A. Fabricator Qualifications: Company specializing in fabricating the products specified in this section with minimum five years of documented experience.
- B. Perform work in accordance with AWI/AWMAC Architectural Woodwork Standards, Custom quality, unless other quality is indicated for specific items.

**1.06 MOCK-UP**

- A. Provide mock-up of typical base cabinet, wall cabinet, and countertop, including hardware, finishes, and plumbing accessories.
- B. Locate where directed.
- C. Mock-up may remain as part of the Work.

**1.07 DELIVERY, STORAGE, AND HANDLING**

- A. Protect units from moisture damage.

**1.08 FIELD CONDITIONS**

- A. During and after installation of custom cabinets, maintain temperature and humidity conditions in building spaces at same levels planned for occupancy.

**PART 2 PRODUCTS****2.01 CABINETS**

- A. Quality Grade: Unless otherwise indicated provide products of quality specified by AWI/AWMAC/WI Architectural Woodwork Standards (AWS) for Premium Grade.
- B. Wood Veneer Faced Cabinet:
  - 1. Exposed Surfaces: PS 1, VG Douglas fir, rotary cut, book-matched.
  - 2. Semi-Exposed Surfaces: PS 1, VG Douglas fir, rotary cut, random-matched.
  - 3. Concealed Surfaces: PS 1, VG Douglas, rotary cut, random-matched.
- C. Plastic Laminate Faced Cabinets: Custom grade.

**2.02 LUMBER MATERIALS**

- A. Softwood Lumber: NIST PS 20; Graded in accordance with AWI/AWMAC Architectural Woodwork Standards, Grade I/Premium; average moisture content of 5-10 percent; species as follows:
  - 1. Concealed Surfaces: Species Douglas fir.
- B. Hardwood Lumber: NHLA; Graded in accordance with AWI/AWMAC Architectural Woodwork Standards, Grade II/Custom; average moisture content of 5-10 percent; species as follows:
  - 1. Exposed Surfaces: Edgebanding and trim at wood faced casework.

**2.03 PANEL MATERIALS**

- A. Softwood Plywood: PS 1; APA A-A Grade; graded in accordance with AWI/AWMAC Quality Standards Illustrated, Premium quality; core of veneer; type of glue recommended for specific application; thickness as required; face veneer as indicated.
- B. Softwood Faced Hardwood Plywood (ApplePly): HPVA HP-1 Grade A-A; uniform laminations of solid grade Birch. PS 1 Grade A-A; Douglas fir face species, rotary cut; of grain quality suitable for transparent finish; 48 x 96 inch sheet size; 3/4 inch thickness.
  - 1. ApplePly by States Industries LLC: [www.appleply.com](http://www.appleply.com).
  - 2. Substitutions: See Section 01 60 00 - Product Requirements.

- C. Hardboard: AHA A135.4; Pressed wood fiber with resin binder, Class 1 - Tempered, 1/4 inch thick, smooth two sides (S2S); use for drawer bottoms, dust panels, and other components indicated on drawings.
- D. Hardwood Edgebanding: Use solid hardwood edgebanding matching species, color, grain, and grade for exposed portions of cabinetry.

#### 2.04 LAMINATE MATERIALS

- A. High Pressure Decorative Laminate (HPDL): NEMA LD 3, types as recommended for specific applications and as follows:
  1. Horizontal Surfaces: HGS, 0.048 inch nominal thickness, through color, colors as scheduled, finish as scheduled.
    - a. Base Cabinets and Open Shelving: Pencil Wood by Formica.
    - b. Countertops: Linen Crisp 4942-38 by Wilsonart.
  2. Vertical Surfaces: VGS, 0.028 inch nominal thickness, through color, colors as scheduled, finish as scheduled.
  3. Acid Resistant Surfaces: HGL, 0.037 inch nominal thickness; chemical and stain resistant type; phenolic resin.
    - a. Countertops: Wilsonart Chemsurf, Carbon Mesh 4880-38.
  4. Cabinet Liner: CLS, 0.020 inch nominal thickness, through color, colors as scheduled, finish as scheduled.
  5. Laminate Backer: BKL, 0.020 inch nominal thickness, undecorated; for application to concealed backside of panels faced with high pressure decorative laminate.

#### 2.05 SOLID SURFACING MATERIALS

- A. Solid Surfacing Sheet and Plastic Resin Castings: Complying with 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.
  1. Flat Sheet Thickness: 1/2 inch, minimum.
  2. Surface Burning Characteristics: Flame spread 25, maximum; smoke developed 450, maximum; when tested in accordance with ASTM E 84.
  3. NSF approved for food contact.
  4. Sinks and Bowls: Separate units for undercounter mounting; minimum 3/4 inch wall thickness; comply with ANSI Z124.3.
  5. Finish on Exposed Surfaces: Matte, gloss rating of 5 to 20.
  6. Color: Corian Dove.
  7. Manufacturers:
    - a. Dupont : [www.corian.com](http://www.corian.com).
    - b. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Quartz Surfacing: Homogenous quartz surface material.
  1. Flat Sheet Thickness: 3/4 inch, minimum.
  2. Surface Burning Characteristics: Flame spread 10, maximum smoke developed 50.
  3. NSF approved for food contact.
  4. Finish on Exposed Surfaces: Semi-gloss.
  5. Color: Crystal White Polishes.
  6. Products:
    - a. Pental Quartz: [www.pentalquartz.com](http://www.pentalquartz.com).
    - b. Substitutions: See Section 01 60 00 - Product Requirements.

#### 2.06 COUNTERTOPS

- A. Solid Wood Laminated Surfacing: Custom quality hardwood; maple, plain sawn, exposed edge grain; laminated with waterproof adhesives; thickness as recommended by fabricator; suitable for transparent finish; 2 inches thick or as indicated on Drawings.

- B. Solid Surfacing Countertops: Plywood substrate covered with solid surfacing sheet, conventionally fabricated, with self-edge.
- C. Plastic Laminate Countertops: Plywood substrate covered with HPDL, conventionally fabricated and self-edge banded and turn-down edge as indicated on Drawings..

## 2.07 ACCESSORIES

- A. Adhesive: Type recommended by fabricator to suit application.
- B. Fasteners: Size and type to suit application.
- C. Bolts, Nuts, Washers, Lags, Pins, and Screws: Of size and type to suit application; galvanized or chrome-plated finish in concealed locations and stainless steel or chrome-plated finish in exposed locations.
- D. Concealed Joint Fasteners: Threaded steel.
- E. Grommets: Standard plastic, painted metal, or rubber grommets for cut-outs, in color to match adjacent surface.
- F. Glass Doors and Shelves: Tempered safety glass specified in Section 08 80 00. Grind edges with radius, smooth; 1/4 inch thickness.
- G. Metal Fascia (Display Case): Steel sheet metal, 14 gage; bend to profile indicated on Drawings; ease edges; shop prime for field finishing.
- H. Steel Supports: Stainless steel, 0.078 inch thick; No. 4 finish; bend to profile indicated on Drawings.

## 2.08 HARDWARE

- A. Hardware: BHMA A156.9, types as indicated for quality grade specified.
- B. Adjustable Shelf Supports (Open Wall Shelving): Standard back-mounted system using heavy-duty surface mounted metal shelf standards with double slots and coordinated cantilevered shelf brackets to support 18 inch deep shelves, zinc plated finish, for nominal 1 inch spacing adjustments.
  - 1. Products:
    - a. Model 85 Standard and Model 185-18 Bracket by Knape & Vogt: [www.kv.com](http://www.kv.com).
    - b. Substitutions: See Section 01 60 00 - Product Requirements.
- C. Glass Shelf Supports (Display Case): Back-mounted system using heavy duty surface mounted metal shelf standards with slots and coordinated cantilevered 14 gage shelf support brackets to support 16 inch deep glass shelves, zinc plated finish, for nominal 1 inch spacing adjustments.
  - 1. Products:
    - a. Model Model 85 Standard and Model 161 Lock Bracket by Knape & Vogt: [www.kv.com](http://www.kv.com).
    - b. Substitutions: See Section 01 60 00 - Product Requirements.
- D. Shelf Rests: Steel, angular with riveted 0.5 mm diameter pin and securing hole; nickel plated.
  - 1. Products:
    - a. Item No. 282.11.710 by Hafele America Co: [www.hafeleus.com](http://www.hafeleus.com).
    - b. Substitutions: See Section 01 60 00 - Product Requirements.
- E. Drawer and Door Pulls: "U" shaped wire pull, steel with satin finish, 4 inch centers.
  - 1. Products:
    - a. No. 4484 by Stanley Manufacturing Co.: [www.stanleyhardware.com](http://www.stanleyhardware.com).
    - b. EPCO Stainless Steel Wire Pull by Engineered Products Co: [www.epcohardware.com](http://www.epcohardware.com).
    - c. Substitutions: Not permitted.
- F. Cabinet Locks: Keyed cylinder, two keys per lock, master keyed, steel with satin finish.
  - 1. Products:
    - a. 100DR and 200DW by Olympus Lock: [www.olympus-lock.com](http://www.olympus-lock.com).

- b. Substitutions: See Section 01 60 00 - Product Requirements.
- G. Drawer Slides:
- 1. Type: Full extension.
  - 2. Static Load Capacity: Heavy Duty grade.
    - a. Pencil and Box Drawers: 100 pound capacity.
    - b. File Drawers: 200 pound capacity.
  - 3. Mounting: Side mounted.
  - 4. Stops: Integral type.
  - 5. Features: Provide self closing/stay closed type.
  - 6. Products:
    - a. Series 230m by Julius Blum, Inc: [www.blum.com](http://www.blum.com).
    - b. Accuride International, Inc: [www accuride.com](http://www accuride.com).
    - c. Substitutions: Not permitted.
- H. Hinges: Semiconcealed self-closing type, steel with satin finish.
- 1. Products:
    - a. Julius Blum, Inc: [www.blum.com](http://www.blum.com).
    - b. Substitutions: Not permitted.
- I. Hinges: Continuous piano type, steel with satin finish.
- 1. Products:
    - a. Model STS 311-1/4 by Stanley Manufacturing Co: [www.stanleyhardware.com](http://www.stanleyhardware.com).
    - b. Substitutions: See Section 01 60 00 - Product Requirements.
- J. Sliding Glass Door Track Assemblies: Upper and lower track of satin anodized aluminum, with matching shoe equipped with ball-bearing rollers; two bi-pass door panels; widths as indicated on Drawings.
- 1. Products:
    - a. Model KVM-P992ZC by Knape & Vogt: [www.kv.com](http://www.kv.com).
    - b. Substitutions: See Section 01 60 00 - Product Requirements.
- K. Sliding Glass Door Lock: Ratchet type, chrome finish; keyed.
- 1. Products:
    - a. Model KVM-963KA by Knape & Vogt: [www.kv.com](http://www.kv.com).
    - b. Substitutions: See Section 01 60 00 - Product Requirements.
- L. Grommets: Ring type, 3 inch diameter; brushed aluminum.
- 1. Products:
    - a. Model ABG3 by Doug Mocket & Company.
    - b. Substitutions: See Section 01 60 00 - Product Requirements
- M. Wire Management: 3 inch x 3 inch formed channel plastic raceway.
- 1. Products:
    - a. Model WM9 by Doug Mocket & Company.
    - b. Substitutions: See Section 01 60 00 - Product Requirements.
- N. Coat Hooks: Single hook type; satin finish.
- 1. Products:
    - a. B-6717 by Bobrick Washroom Equipment Inc: [www.bobrick.com](http://www.bobrick.com).
    - b. Substitutions: See Section 01 60 00 - Product Requirements.
- O. Casters of Mobile Casework (Media Room 202): Heavy duty swiveling type, 5 inch diameter, non-marring thermoplastic rubber (TPR) wheels; 198 lbs capacity. Provide in sets of four casters, two with breaks and two without breaks of each moveable casework unit.
- 1. Products:
    - a. Institutional Caster Series M68 by Bassick
    - b. Substitutions: See Section 01 60 00 - Product Requirements.
- P. Countertop Support Brackets: Welded steel, concealed vertical plate support; T-shaped horizontal support; minimum 1,800 capacity; black powder coat finish.



1. Product:
  - a. Concealed Bracket C by A&M Hardware, Inc: [www.aandmhardware.com](http://www.aandmhardware.com).
  - b. Substitutions: See Section 01 60 00 - Product Requirements.

## **2.09 FABRICATION**

- A. Cabinet Style: Reveal overlay.
- B. Cabinet Doors and Drawer Fronts: Flush style.
- C. Drawer Construction Technique: Dovetail joints.
- D. Assembly: Shop assemble cabinets for delivery to site in units easily handled and to permit passage through building openings.
- E. Edging: Fit shelves, doors, and exposed edges with specified edging. 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. Apply cabinet liner to the interior surface of drawers.
  3. Cap exposed plastic laminate finish edges with material of same finish and pattern.
- H. Matching Wood Grain: Comply with requirements of quality standard for specified Grade and as follows:
  1. Provide center matched panels at each elevation.
  2. Provide sequence matching across each elevation.
- I. Mechanically fasten back splash to countertops as recommended by laminate manufacturer at 16 inches on center.
- J. Provide cutouts for plumbing fixtures. Verify locations of cutouts from on-site dimensions. Prime paint cut edges.
- K. Casters: Install four casters on each

## **2.10 FACTORY FINISHING**

- A. Sand work smooth and set exposed nails and screws.
- B. For opaque finishes, apply wood filler in exposed nail and screw indentations and sand smooth.
- C. On items to receive transparent finishes, use wood filler matching or blending with surrounding surfaces and of types recommended for applied finishes.
- D. Finish work in accordance with AWI/AWMAC/WI Architectural Woodwork Standards (AWS), Section 5 - Finishing for Grade specified and as follows:
  1. Transparent:
    - a. System - 5, Varnish, Conversion.
    - b. Stain: As selected by Architect.
    - c. Sheen: Flat.
- E. Finish work in accordance with AWI/AWMAC Architectural Woodwork Quality Standards Illustrated, Section 1500, Conversion Varnish, Transparent.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify adequacy of backing and support framing.

- B. Verify location and sizes of utility rough-in associated with work of this section.

**3.02 INSTALLATION**

- A. Set and secure custom cabinets in place, assuring that they are rigid, plumb, and level.
- B. Use fixture attachments in concealed locations for wall mounted components.
- 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.
- F. Countersink anchorage devices at exposed locations. Conceal with solid wood plugs of species to match surrounding wood; finish flush with surrounding surfaces.

**3.03 ADJUSTING**

- A. Adjust installed work.
- B. Adjust moving or operating parts to function smoothly and correctly.

**3.04 CLEANING**

- A. Clean casework, counters, shelves, hardware, fittings, and fixtures.

**END OF SECTION**

**FIBERGLASS REINFORCED PLASTIC PANELS****PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Fiberglass reinforced polyester panel system for adhesive mounting.
- B. Moldings, adhesive, and joint sealants.

**1.02 RELATED SECTIONS**

- A. Section 09 21 16 - Gypsum Board Assemblies: Substrates.

**1.03 REFERENCES**

- A. ASTM D 570 - Standard Test Method for Water Absorption of Plastics; 1998.
- B. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2005.

**1.04 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
  - 1. Preparation instructions and recommendations.
  - 2. Storage and handling requirements and recommendations.
  - 3. Installation methods.
- C. Maintenance Instructions.

**1.05 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.

**1.06 PROJECT 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 PANEL SYSTEM (FRP)**

- A. Plastic Panel System: Factory finished panels, trim, sealant, and accessories.
- B. Panels: Fiberglass reinforced polyester, USDA approved for incidental food contact.
  - 1. Surface Burning Characteristics: Flame spread index of 200 or less, smoke developed index of 450 or less, when tested in accordance with ASTM E 84 (Class C/III).
  - 2. Surface Texture: Smooth, matte-gloss.
  - 3. Color: White.
  - 4. Thickness: 0.09 inch, nominal.
  - 5. Width: 48 inches.
  - 6. Height: 96 inches.
  - 7. Water Absorption: 0.17 percent, when tested in accordance with ASTM D 570.
- C. Products:
  - 1. Glasbord by Kemlite Company, Inc: [www.glasbord.com](http://www.glasbord.com).
  - 2. Substitutions: See Section 01 60 00 - Product Requirements.
- D. Panel Trim: Extruded PVC, in manufacturer's standard colors.

1. Outside corners, inside corners, edge trim, and division molding.

E. Sealant: Silicone Sealant; gunnable silicone rubber; clear.

**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. Take panels out of cartons and allow to acclimatize to room conditions for at least 48 hours 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. Clean surfaces thoroughly prior to installation.

D. Protect existing surfaces from damage due to installation.

**3.03 INSTALLATION**

A. Install in accordance with manufacturer's instructions.

B. Use the adhesives recommended by the panel manufacturer unless prohibited by local regulations; obtain manufacturer's approval of alternative adhesives.

C. Install continuous bead of silicone sealant in each joint and trim groove and between trim and adjacent construction, maintaining 1/8 inch expansion space.

D. Avoid contamination of panel faces with adhesives, solvents, or cleaners; clean as necessary and replace if not possible to repair to original condition.

E. Protect installed products until completion of project.

F. Touch-up, repair or replace damaged products after Substantial Completion.

**END OF SECTION**

## SHEET WATERPROOFING

### PART 1 GENERAL

#### 1.01 SECTION INCLUDES

- A. Sheet membrane waterproofing.
- B. Accessories.
- C. Drainage panels.

#### 1.02 RELATED REQUIREMENTS

- A. Section 32 20 00 - Earth Moving: Excavation and fill.
- B. Section 03 30 00 - Cast-In-Place Concrete: Concrete substrate.

#### 1.03 REFERENCE STANDARDS

- A. ASTM D412 - Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers-Tension; 2006a (Reapproved 2013).

#### 1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data for membrane.
- C. Shop Drawings: Indicate special joint or termination conditions and conditions of interface with other materials.
- D. Manufacturer's Installation Instructions: Indicate special procedures.
- E. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

#### 1.05 QUALITY ASSURANCE

- A. Membrane Manufacturer Qualifications: Company specializing in waterproofing sheet membranes with three years experience.
- B. Installer Qualifications: Company specializing in performing the work of this section with minimum three years experience.

#### 1.06 FIELD CONDITIONS

- A. Maintain ambient temperatures above 40 degrees F for 24 hours before and during application and until liquid or mastic accessories have cured.

#### 1.07 WARRANTY

- A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.
- B. Contractor shall correct defective Work within a five year period after Date of Substantial Completion; remove and replace materials concealing waterproofing at no extra cost to Owner.
- C. Provide five year manufacturer warranty for waterproofing failing to resist penetration of water , except where such failures are the result of structural failures of building. Hairline cracking of concrete due to temperature change or shrinkage is not considered a structural failure.

### PART 2 PRODUCTS

#### 2.01 MEMBRANE MATERIALS

- A. Composite Laminate Membrane: Comprised of 0.056 inch thickness of rubberized asphalt and a 0.040 inch thickness of polyethylene film; 0.060 inch total thickness; self-adhering.

1. Sheet Width: 36 inch, minimum.
2. Tensile Strength: 325 psi, measured in accordance with ASTM D 412.
3. Ultimate Elongation: 300 percent, measured in accordance with ASTM D 412.
4. Water Absorption: 0.1 to 0.23 percent increase in weight, maximum, measured in accordance with ASTM D 570, 24 hour immersion.
5. Water Vapor Permeability: 0.05 perm inch, measured in accordance with ASTM E 96/E 96M.
6. Products:
  - a. Bituthane 3000 by W. R. Grace Company: [www.na.graceconstruction.com](http://www.na.graceconstruction.com).
  - b. Polyguard No. 650 by Polyguard Products, Inc: [www.polyguardproducts.com](http://www.polyguardproducts.com).
  - c. Jiffy Seal 140/60 by Protecto Wrap Company: [www.protectowrap.com](http://www.protectowrap.com).
  - d. CCW Miradri 860 by Carlisle Coatings and Waterproofing: [www.carlisle-ccw.com](http://www.carlisle-ccw.com).
  - e. Substitutions: See Section 01 60 00 - Product Requirements.

- B. Seaming Materials: As recommended by membrane manufacturer.
- C. Membrane Sealant: As recommended by membrane manufacturer.
- D. Termination Bars: Stainless steel; compatible with membrane and adhesives.
- E. Surface Primer: Recommended by membrane manufacturer for substrate.
- F. Thinner and Cleaner: As recommended by adhesive manufacturer, compatible with sheet membrane.

## **2.02 ACCESSORIES**

- A. Sealant: Recommended by membrane manufacturer.
- B. Drainage Panel: 0.40 inch thick formed plastic, hollowed sandwich with fabric and film faces.
  1. Hydroduct 220 Drainage Composite by W. R. Grace: [www.na.graceconstruction.com](http://www.na.graceconstruction.com).
  2. Polyflow 10P by Polyguard Products, Inc: [www.polyguardproducts.com](http://www.polyguardproducts.com).
  3. Protecto Drain 2000-V by Protecto Wrap Company: [www.protectowrap.com](http://www.protectowrap.com).
  4. Miradrain 9000 by Carlisle Coatings and Waterproofing: [www.carlisle-ccw.com](http://www.carlisle-ccw.com).
  5. Substitutions: 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 durable; free of matter detrimental to adhesion or application of waterproofing system.
- C. 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. Vacuum substrate clean.
- C. Do not apply waterproofing to surfaces unacceptable to membrane manufacturer.
- D. Seal cracks and joints with sealant using depth to width ratio as recommended by sealant manufacturer.
- E. Pre-strip wall cracks over 1/16 inch width with 8 inch wide membrane.
- F. Apply primer at a rate recommended by membrane manufacturer. Protect primer from rain or frost until dry.

**3.03 INSTALLATION - MEMBRANE**

- A. Install membrane waterproofing in accordance with manufacturer's instructions.
- B. Roll out membrane. Minimize wrinkles and bubbles.
- C. Self-Adhering Membrane: Remove release paper layer. Roll out on substrate with a mechanical roller to encourage full contact bond.
- D. Overlap edges and ends and seal by method recommended by manufacturer, minimum 3 inches. Seal permanently waterproof. Apply uniform bead of sealant to joint edge.
- E. Reinforce membrane with multiple thickness of membrane material over joints, whether joints are static or dynamic.
- F. Weather lap joints on sloped substrate in direction of drainage. Seal joints and seams.
- G. Install flexible flashings. Seal items penetrating through membrane with flexible flashings. Seal watertight to membrane.
- H. Seal membrane and flashings to adjoining surfaces. Install termination bar at all edges. Install counterflashing over all exposed edges.

**3.04 INSTALLATION - DRAINAGE PANEL**

- A. Place drainage panel directly against membrane, butt joints, place to encourage drainage downward. Scribe and cut boards around projections, penetrations, and interruptions.
- B. Adhere protection board to substrate with compatible adhesive.

**3.05 PROTECTION**

- A. Do not permit traffic over unprotected or uncovered membrane.

**3.06 SCHEDULE**

- A. Elevator Pits: One ply of composite laminate membrane applied to exterior face of walls, reinforced corners; drainage panel cover.
- B. Other Locations: As indicated on Drawings.

**END OF SECTION**

**THERMAL INSULATION****PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Board insulation at over roof deck, over roof sheathing, and exterior wall behind exterior wall finish.
- B. Batt insulation in exterior wall construction.
- C. Foam insulation at cavities in wall assemblies.

**1.02 RELATED REQUIREMENTS**

- A. Section 07 21 13.01 - Floor Slab Board Insulation.
- B. Section 07 25 00 - Weather Barriers: Separate air barrier and vapor retarder materials.
- C. Section 07 41 13 - Metal Roof Panels: Metal roofing system.
- D. Section 07 54 00 - Thermoplastic Membrane Roofing; Insulation specified as part of roofing system.

**1.03 REFERENCE STANDARDS**

- A. ASTM C 272 - Standard Test Method for Water Absorption of Core Materials for Structural Sandwich Construction; 2001.
- B. ASTM C 518 - Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus; 2004.
- C. ASTM C612 - Standard Specification for Mineral Fiber Block and Board Thermal Insulation; 2014.
- D. ASTM C665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing; 2012.
- E. ASTM C1289 - Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board; 2014.
- F. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2014.
- G. ASTM E136 - Standard Test Method for Behavior of Materials in a Vertical Tube Furnace At 750 Degrees C; 2012.

**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. Manufacturer's Installation Instructions: Include information on special environmental conditions required for installation and installation techniques.

**1.05 FIELD CONDITIONS**

- A. Do not install insulation adhesives when temperature or weather conditions are detrimental to successful installation.

**PART 2 PRODUCTS****2.01 FOAM BOARD INSULATION MATERIALS**

- A. Polyisocyanurate Board Insulation with Facers Both Sides: Rigid cellular foam, complying with ASTM C1289; Type II, Class 1, cellulose felt or glass fiber mat both faces; Grade 2.



1. Flame Spread Index: 25 or less, when tested in accordance with ASTM E84.
  2. Smoke Developed Index: 450 or less, when tested in accordance with ASTM E84.
  3. Compressive Strength: 20 psi
  4. Board Size: 48 x 96 inch.
  5. Thermal Resistance: R-value of 14.4 minimum.
  6. Board Edges: Square.
  7. Manufacturers:
    - a. Carlisle Syntec Systems: [www.carlislesyntec.com](http://www.carlislesyntec.com).
    - b. Dow Chemical Co: [www.dow.com](http://www.dow.com).
    - c. GAF: [www.gaf.com](http://www.gaf.com).
    - d. Hunter Panels, LLC: [www.hpanels.com](http://www.hpanels.com).
    - e. Johns Manville: [www.jm.com](http://www.jm.com).
    - f. Rmax Inc.: [www.rmax.com](http://www.rmax.com).
  8. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Composite Polyisocyanurate Board Insulation Faced with Plywood: Rigid cellular foam, complying with ASTM C1289; Type V, fire-retardant-treated plywood one face, glass fiber mat facer one face, Class 2.
1. Flame Spread Index: 25 or less, when tested in accordance with ASTM E84.
  2. Smoke Developed Index: 450 or less, when tested in accordance with ASTM E84.
  3. Compressive Strength: 20 psi
  4. Board Size: 48 x 96 inch.
  5. Plywood Thickness: 5/8 inch.
  6. Thermal Resistance: R-value of 15.9 minimum.
  7. Board Edges: Square.
  8. Manufacturers:
    - a. Hunter Panels, LLC; Xci Ply: [www.hunterxci.com](http://www.hunterxci.com).
    - b. Carlisle Syntec Systems: [www.carlislesyntec.com](http://www.carlislesyntec.com).
  9. Substitutions: See Section 01 60 00 - Product Requirements.

## 2.02 FIBER BOARD INSULATION MATERIALS

- A. Mineral Fiber Board Insulation: Rigid or semi-rigid mineral fiber, ASTM C612 or C553; unfaced flame spread index of 0 (zero) when tested in accordance with ASTM E84.
1. Smoke Developed Index: 0 (zero), when tested in accordance with ASTM E84.
  2. Board Size: 24 by 48 inches.
  3. Board Thickness: As required to meet minimum R-value specified.
  4. Thermal Resistance: R of 7.5 minimum.
  5. Maximum Density: 8.0 lb/cu ft.
  6. Manufacturers:
    - a. ROXUL, Inc; ComfortBoard IS: [www.rspec.com](http://www.rspec.com).
  7. Substitutions: See Section 01 60 00 - Product Requirements.

## 2.03 BATT INSULATION MATERIALS

- A. Where batt insulation is indicated, either glass fiber or mineral fiber batt insulation may be used, at Contractor's option.
- B. Glass Fiber Batt Insulation: Flexible preformed batt or blanket, complying with ASTM C665; friction fit.
1. Combustibility: Non-combustible, when tested in accordance with ASTM E136, except for facing, if any.
  2. Formaldehyde Content: Zero.
  3. Thermal Resistance: R of 19 at walls; R of 30 at ceiling soffits.
  4. Facing: Unfaced.
  5. Manufacturers:
    - a. CertainTeed Corporation: [www.certainteed.com](http://www.certainteed.com).
    - b. Johns Manville Corporation: [www.jm.com](http://www.jm.com).
    - c. Owens Corning Corp: [www.owenscorning.com](http://www.owenscorning.com).
    - d. Substitutions: See Section 01 60 00 - Product Requirements.

- C. Mineral Fiber Batt Insulation: Flexible or semi-rigid preformed batt or blanket, complying with ASTM C665; friction fit; unfaced flame spread index of 0 (zero) when tested in accordance with ASTM E84.
  - 1. Smoke Developed Index: 0 (zero), when tested in accordance with ASTM E84.
  - 2. Thermal Resistance: R of 19.
  - 3. Manufacturers:
    - a. Johns Manville International, Inc.; MinWool Sound Attenuation Fire Batts: [www.jm.com](http://www.jm.com).
    - b. Thermafiber, Inc: [www.thermafiber.com](http://www.thermafiber.com).
    - c. ROXUL, Inc; ComfortBatt: [www.rspec.com](http://www.rspec.com).
    - d. Substitutions: See Section 01 60 00 - Product Requirements.

## 2.04 FOAM INSULATION

- A. Foamed-In-Place Insulation: Medium-density, closed cell polyurethane foam; foamed on-site, using blowing agent of water or non-ozone-depleting gas.
  - 1. Aged Thermal Resistance (R-value): 5 (deg F hr sq ft)/Btu, minimum, when tested at 1 inch thickness in accordance with ASTM C518 after aging for 180 days at 41 degrees F.
  - 2. Water Vapor Permeance: Vapor retarder; 1 perm, maximum, when tested at intended thickness in accordance with ASTM E96/E96M, desiccant method.
  - 3. Water Absorption: Less than 2 percent by volume, maximum, when tested in accordance with ASTM D2842.
  - 4. Air Permeance: 0.004 cfm/sq ft, maximum, when tested at intended thickness in accordance with ASTM E2178 or ASTM E283 at 1.5 psf.
  - 5. Closed Cell Content: At least 90 percent.
  - 6. Surface Burning Characteristics: Flame spread/Smoke developed index of 25/450, maximum, when tested in accordance with ASTM E84.
  - 7. Products:
    - a. Henry Company; PERMAX 2.0: [www.henry.com](http://www.henry.com).
    - b. Icynene Inc; Icynene ProSeal Eco MD-R-210: [www.icynene.com](http://www.icynene.com).
    - c. Johns Manville; JM Corbond III Closed Cell Spray Polyurethane Foam: [www.jm.com](http://www.jm.com).
    - d. Substitutions: See Section 01 60 00 - Product Requirements.

## 2.05 ACCESSORIES

- A. Sheet Vapor Retarder: Specified in Section 07 25 00.
- B. Adhesive: Type recommended by insulation manufacturer for application.

## 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 and adhesive.
- B. Verify substrate surfaces are flat, free of irregularities or materials or substances that may impede adhesive bond.

### 3.02 BOARD INSTALLATION AT EXTERIOR WALLS

- A. Install boards horizontally or vertically on walls.
  - 1. Place boards to maximize adhesive contact.
  - 2. Install in running bond pattern.
  - 3. Butt edges and ends tightly to adjacent boards and to protrusions.
- B. Extend boards over expansion joints, unbonded to wall on one side of joint.
- C. Cut and fit insulation tightly to protrusions or interruptions to the insulation plane.
- D. Fill gaps in insulation with compatible insulation.

**3.03 BOARD INSTALLATION UNDER METAL ROOFING SYSTEM**

- A. Coordinate installation of insulation with installation of roof vapor barrier specified in Section 07 25 00 - Weather Barriers.
- B. Install insulation products in accordance with manufacturer's recommendations.
- C. Install first layer of installation over vapor retarder; secure to plywood deck.
- D. Install composite polyisocyanurate board insulation with plywood face up; stagger joints from first layer; secure with adhesive.

**3.04 BATT INSTALLATION**

- A. Install insulation in accordance with manufacturer's instructions.
- B. Install in exterior wall spaces without gaps or voids. Do not compress insulation.
- C. Trim insulation neatly to fit spaces. Insulate miscellaneous gaps and voids.
- D. Fit insulation tightly in cavities and tightly to exterior side of mechanical and electrical services within the plane of the insulation.
- E. Coordinate work of this section with requirements for vapor retarder specified in Section 07 25 00.

**3.05 FOAM INSULATION INSTALLATION**

- A. Mask and protect adjacent surfaces from over spray or dusting.
- B. Apply primer in accordance with manufacturer's instructions.
- C. Apply insulation in accordance with manufacturer's instructions.
- D. Apply insulation by spray or froth method, to a uniform monolithic density without voids.
- E. Where applied to voids and gaps assure space for expansion to avoid pressure on adjacent materials that may bind operable parts.

**3.06 PROTECTION**

- A. Do not permit installed insulation to be damaged prior to its concealment.

**END OF SECTION**

## FLOOR SLAB BOARD INSULATION

### PART 1 GENERAL

#### 1.01 SECTION INCLUDES

- A. Board insulation at underside of floor slabs and perimeter slab edges at radiant floor heating system.

#### 1.02 RELATED REQUIREMENTS

- A. Section 03 30 00 - Cast-In-Place Concrete: Concrete floors and under slab vapor retarder.
- B. Section 07 21 00 - Thermal Insulation.
- C. Section 23 21 13 - Pipe and Pipe Fittings for HVAC: Radiant floor system piping.

#### 1.03 REFERENCE STANDARDS

- A. ASTM C 578 - Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation; 2009.
- B. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building 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. Manufacturer's Installation Instructions: Include information on special environmental conditions required for installation and installation techniques.

#### 1.05 FIELD CONDITIONS

- A. Do not install insulation adhesives when temperature or weather conditions are detrimental to successful installation.

### PART 2 PRODUCTS

#### 2.01 FOAM BOARD INSULATION MATERIALS

- A. Extruded Polystyrene Board Insulation: ASTM C 578, Type V; cellular type, either natural skin or cut cell surfaces; with the following characteristics:
  1. Flame Spread Index: 10 or less, when tested in accordance with ASTM E 84.
  2. Smoke Developed Index: 450 or less, when tested in accordance with ASTM E 84.
  3. Board Size: 24 x 96 inch.
  4. Board Thickness:
    - a. Slab Edges (Radiant Heated Slabs): 3 inches (R-15).
    - b. Underslab (Radiant Heated Slabs): 1 inch (R-5) over extent of heated slab area.
  5. Board Edges: Square.
  6. Thermal Resistance (R value): 5.0 per inch thickness per ASTM C 518 at 75 degrees F.
  7. Compressive Resistance: 25 psi.
  8. Water Absorption, maximum: 0.1 percent, volume per ASTM C 272.
  9. Products:
    - a. Styrofoam by Dow Chemical Co: [www.dow.com](http://www.dow.com).
    - b. Foamular by Owens Corning Corp: [www.owenscorning.com](http://www.owenscorning.com).
    - c. Substitutions: See Section 01 60 00 - Product Requirements.

#### 2.02 ACCESSORIES

- A. Sheet Vapor Retarder: Specified in Section 03 30 00.
- B. Adhesive: Type recommended by insulation manufacturer for application.

**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 irregularities.

**3.02 BOARD INSTALLATION UNDER CONCRETE SLABS AND AT FACE OF SLAB EDGES**

- A. Place insulation under radiant floor slabs on grade after base for slab has been compacted.
- B. Place insulation at the exterior vertical edge of radiant floor slabs as indicated on Drawings.
- C. Cut and fit insulation tightly to protrusions or interruptions to the insulation plane.
- D. Secure slab edge insulation with adhesive.
- E. Prevent insulation from being displaced or damaged while placing vapor retarder and placing slab.

**3.03 PROTECTION**

- A. Do not permit installed insulation to be damaged prior to its concealment.

**END OF SECTION**

## WEATHER BARRIERS

### PART 1 GENERAL

#### 1.01 SECTION INCLUDES

- A. Water-Resistive Barrier (WRB): Exterior walls and roof assemblies.
- B. Vapor Retarders, Interior Face of Walls: Materials to make exterior walls vapor-resistant.

#### 1.02 RELATED REQUIREMENTS

- A. Section 03 30 00 - Cast-in-Place Concrete: Vapor retarder under concrete slabs on grade.
- B. Section 05 40 00 - Cold-Formed Metal Framing: Exterior wall framing.
- C. Section 04 27 31 - Reinforced Unit Masonry: CMU exterior walls.
- D. Section 07 13 00 - Sheet Waterproofing: Below grade waterproofing membrane.
- E. Section 07 21 00 - Thermal Insulation: Rigid and batt insulation used in wall and roof assemblies.
- F. Section 07 41 13 - Metal Roofing Panels: Metal roofing system.
- G. Section 07 46 46- Fiber Cement Siding: Exterior wall finish; furring for concrete construction.
- H. Section 07 54 00 - Thermoplastic Membrane Roofing: Membrane roofing and insulation system.
- I. Section 07 62 00 - Sheet Metal Flashing and Trim: Sheet metal flashing and window sill pans to be sealed to weather barrier system.
- J. Section 07 90 05 - Joint Sealers: Sealant materials and installation techniques.
- K. Section 09 21 16 - Gypsum Board Assemblies: Exterior gypsum sheathing.

#### 1.03 REFERENCE STANDARDS

- A. ASTM D1970/D1970M - Standard Specification for Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection; 2013.
- B. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2014.
- C. ASTM E96/E96M - Standard Test Methods for Water Vapor Transmission of Materials; 2013.
- D. ASTM E1745 - Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs; 2011.
- E. ASTM E2178 - Standard Test Method for Air Permeance of Building Materials; 2013.

#### 1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on material characteristics.
- C. Manufacturer's Installation Instructions: Indicate preparation.

#### 1.05 MOCK-UP

- A. Install weather-resistive barrier and vapor retarder materials materials in mock-up specified in Section 01 40 00 - Quality Requirements.
- B. Provide a mock-up, 10 feet long by 10 feet high, illustrating installation procedures and techniques.
- C. Accepted mock-up may remain as part of the Work.

**1.06 FIELD CONDITIONS**

- A. Maintain temperature and humidity recommended by the materials manufacturers before, during and after installation.

**1.07 WARRANTY**

- A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.
- B. Correct defective Work within a five year period after the date of Substantial Completion.

**PART 2 PRODUCTS****2.01 WEATHER BARRIER ASSEMBLIES**

- A. Water-Resistive Barrier - WRB-A:
  - 1. Provide on exterior walls under exterior cladding assembly as air barrier.
- B. Water-Resistive Barrier - WRB-B:
  - 1. Provide on face of exterior CMU walls under exterior cladding assembly as vapor and air barrier.
  - 2. Provide on roof assembly under rigid insulation as vapor and air barrier.
- C. Interior Vapor Retarder:
  - 1. On inside face of studs of exterior walls, under cladding, use adhesive fastened vapor retarder sheet.

**2.02 AIR BARRIER MATERIALS (WATER VAPOR PERMEABLE AND WATER-RESISTIVE)**

- A. Weather-Resistive Barrier (WRB-A); Air Barrier, Water-Resistive; Vapor Permeable; Self-Adhered:
  - 1. Air Permeance: 0.004 cubic feet per minute per square foot, maximum, when tested in accordance with ASTM E2178.
  - 2. Water Vapor Permeance: 29 perms, minimum, when tested in accordance with ASTM E96/E96M Procedure A (desiccant method).
  - 3. Ultraviolet and Weathering Resistance: Approved in writing by manufacturer for maximum of 150 days weather exposure.
  - 4. Surface Burning Characteristics: Flame spread index of 25 or less, smoke developed index of 450 or less (Class A), when tested in accordance with ASTM E84.
  - 5. Thickness: Nominal 23 mils, minimum.
  - 6. Products:
    - a. Henry Company; Blueskin VP160: [www.henry.com](http://www.henry.com).

**2.03 AIR BARRIER MATERIALS (NON-PERMEABLE AND WATER-PROOF)**

- A. Weather-Resistive Barrier (WRB-B): Sheet Rubber Asphalt Barrier Membrane : Rubberized asphalt bonded to sheet polyethylene, self-adhesive, complying with ASTM D 1970.
  - 1. Thickness: 40 mil, nominal.
  - 2. Water Vapor Permeance: 0.05 perm, maximum, when tested in accordance with ASTM E 96/E 96M.
  - 3. Water Absorption: Less than 0.1 percent per ASTM D 570.
  - 4. Elongation: 200 percent per ASTM D 412.
  - 5. Tensile Strength: 400 psi minimum per ASTM D412, Composite.
  - 6. Products:
    - a. Perm-A-Barrier by W.R. Grace & Company.
    - b. Blueskin SA by Henry Company.
    - c. Substitutions: See Section 01 60 00 - Product Requirements.

**2.04 SHEET MEMBRANE MATERIALS**

- A. Vapor Retarder Sheet : Multi-layer, fabric-, cord-, grid-, or aluminum-reinforced polyethylene or equivalent, complying with ASTM E1745, Class A; stated by manufacturer as suitable for application indicated. Single ply polyethylene is prohibited.
  - 1. Water Vapor Permeance: 0.03 perm, maximum, when tested in accordance with ASTM E96/E96M.
- B. Joint Tape: As recommended by coating manufacturer and suitable to the substrate.

**2.05 SEALANTS**

- A. Sealant: As recommended by membrane manufacturer.
- B. Sealant Backers: As specified in Section 07 90 05.
- C. Primers, Cleaners, and Other Sealant Materials: As recommended by sealant manufacturer, appropriate to application, and compatible with adjacent materials.

**2.06 ADHESIVES**

- A. Adhesive : Compatible with sheet seal and substrate, thick mastic of uniform knife grade consistency .

**2.07 ACCESSORIES**

- A. Self-Adhesive Sheet Flashing: ASTM D 1970.
- B. Substrate Primer: Low VOC content primer compatible with membrane and substrate.
- C. Thinners and Cleaners: As recommended by material manufacturer.
- D. Membrane Flashing (WRB-A): Provide pre-cut strips of self-adhering membrane for use in sealer weather barrier to other work; widths as required or as indicated on Drawings.

**PART 3 EXECUTION****3.01 EXAMINATION**

- A. Verify that surfaces and conditions are ready to accept the work of this section.

**3.02 PREPARATION**

- A. Remove projections, protruding fasteners, and loose or foreign matter that might interfere with proper installation.
- B. Clean and prime substrate surfaces to receive sealants in accordance with manufacturer's instructions.

**3.03 INSTALLATION**

- A. Install materials in accordance with manufacturer's instructions.
- B. Water-Resistive Barriers/Air Barriers: Install continuous air tight barrier over surfaces indicated, with sealed seams and with sealed joints to adjacent surfaces.
- C. Vapor Retarders: Install continuous air tight barrier over surfaces indicated, with sealed seams and with sealed joints to adjacent surfaces.
- D. Adhesive/Mechanically Fastened Sheets - Vapor Retarder On Interior:
  - 1. When insulation is to be installed in assembly, install vapor retarder over insulation.
  - 2. Seal seams, laps, perimeter edges, penetrations, tears, and cuts with self-adhesive tape, making air tight seal.
  - 3. Locate laps at a framing member; at laps fasten one sheet to framing member then tape overlapping sheet to first sheet.
  - 4. Seal entire perimeter to structure, window and door frames, and other penetrations.



5. Where conduit, pipes, wires, ducts, outlet boxes, and other items are installed in insulation cavity, pass vapor retarder sheet behind item but over insulation and maintain air tight seal.
- E. Self-Adhesive Sheets:
1. Prepare substrate in manner recommended by sheet manufacturer; fill and tape joints in substrate and between dissimilar materials.
  2. Lap sheets shingle-fashion to shed water and seal laps air tight.
  3. Once sheets are in place, press firmly into substrate with resilient hand roller; ensure that all laps are firmly adhered with no gaps or fishmouths.
  4. Use same material, or other material approved by sheet manufacturer for the purpose, to seal to adjacent construction and as flashing.
  5. At wide joints, provide extra flexible membrane allowing joint movement.
- F. Openings and Penetrations in Exterior Weather-Resistive Barriers/Air Barriers:
1. Install flashing over sills, covering entire sill frame member, extending at least 5 inches onto weather barrier and at least 6 inches up jambs; mechanically fasten stretched edges.
  2. 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.
  3. At head of openings, install flashing under weather barrier extending at least 2 inches beyond face of jambs; seal weather barrier to flashing.
  4. At interior face of openings, seal gap between window/door frame and rough framing, using joint sealant over backer rod.
  5. Service and Other Penetrations: Form flashing around penetrating item and seal to weather barrier surface.

#### **3.04 FIELD QUALITY CONTROL**

- A. Do not cover installed weather barriers until required inspections have been completed.
- 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. Take digital photographs of each portion of the installation prior to covering up.

#### **3.05 PROTECTION**

- A. Do not allow membrane to be exposed to weather for more than 30 days before covering.

**END OF SECTION**

## METAL ROOF PANELS

### PART 1 GENERAL

#### 1.01 SECTION INCLUDES

- A. Architectural roofing system of preformed steel panels.
- B. Fastening system.
- C. Factory finishing.
- D. Accessories and miscellaneous components.

#### 1.02 RELATED REQUIREMENTS

- A. Section 06 10 00 - Rough Carpentry: Roof sheathing.
- B. Section 07 21 00 - Thermal Insulation: Rigid roof insulation with nailable deck.
- C. Section 07 42 13 - Metal Wall Panels: Preformed wall panels.
- D. Section 07 90 05 - Joint Sealers: Field-installed sealants.
- E. Section 07 25 00 - Weather Barriers: Vapor barrier at roofs.

#### 1.03 REFERENCE STANDARDS

- A. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2013.
- B. ASTM D226/D226M - Standard Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing; 2009.

#### 1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
  - 1. Storage and handling requirements and recommendations.
  - 2. Installation methods.
  - 3. Specimen warranty.
- C. Shop Drawings: Include layouts of roof panels, details of edge and penetration conditions, spacing and type of connections, flashings, underlayments, and special conditions.
  - 1. Show work to be field-fabricated or field-assembled.
- D. Verification Samples: For each roofing system specified, submit samples of minimum size 4 inches square, representing actual roofing metal, thickness, profile, color, and texture.
- E. Warranty: Submit specified manufacturer's warranty and ensure that forms have been completed in Owner's name and are registered with manufacturer.

#### 1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in the manufacture of roofing systems similar to those required for this project.
- B. Installer Qualifications: Company trained and authorized by roofing system manufacturer; minimum 3 years documented experience.

#### 1.06 DELIVERY, STORAGE, AND HANDLING

- A. Provide strippable plastic protection on prefinished roofing panels for removal after installation.
- B. Store roofing panels on project site as recommended by manufacturer to minimize damage to panels prior to installation.

**1.07 PROJECT CONDITIONS**

- A. Coordinate the Work for installation of vapor retarder and air barrier seals.

**1.08 WARRANTY**

- A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.
- B. Correct defective work within a five year period after Substantial Completion for degradation of panel finish, including color fading caused by exposure to weather.
- C. Correct defective Work within a five year period after Substantial Completion, including defects in water tightness, and integrity of seals.
- D. Finish Warranty: Provide manufacturer's special warranty covering failure of factory-applied exterior finish on metal roof panels and agreeing to repair or replace panels that show evidence of finish degradation, including significant fading, chalking, cracking, or peeling within specified warranty period of 20 year period from date of Substantial Completion.

**PART 2 PRODUCTS****2.01 ARCHITECTURAL METAL ROOF PANELS**

- A. Architectural Metal Roofing: Provide complete engineered system complying with specified requirements and capable of remaining weathertight while withstanding anticipated movement of substrate and thermally induced movement of roofing system.
- B. Metal Panels: Factory-formed panels with factory-applied finish.
  - 1. Steel Panels:
    - a. Zinc-coated steel conforming to ASTM A653/A653M; minimum G60 galvanizing.
    - b. Steel Thickness: Minimum 24 gage.
  - 2. Profile: Standing seam, with minimum 1-3/4 inch seam height; concealed fastener system lapped seam in standing seam profile; factory applied sealant.
  - 3. Texture: Smooth.
  - 4. Length: Full length of roof slope, without lapped horizontal joints.
  - 5. Width: Maximum panel coverage of 18 inches.
  - 6. System approved for low slope applications over solid deck.
  - 7. Approved Products:
    - a. Vertical Seam by Metal Sales Manufacturing Corp: [www.metalsales.us.com](http://www.metalsales.us.com).
    - b. Substitutions: See Section 01 60 00 - Product Requirements.

**2.02 ATTACHMENT SYSTEM**

- A. Concealed System: Provide manufacturer's standard stainless steel concealed anchor clips designed for specific roofing system and engineered to meet performance requirements, including anticipated thermal movement.

**2.03 PANEL FINISH**

- A. Fluoropolymer Coating System: Manufacturer's standard multi-coat thermocured coating system, including minimum 70 percent fluoropolymer color topcoat with minimum total dry film thickness of 0.9 mil; color and gloss to match Silversmith (Mica) by Morin (Valspar).
- B. Solar reflectance index (SRI): 59.

**2.04 ACCESSORIES AND MISCELLANEOUS ITEMS**

- A. Miscellaneous Sheet Metal Items: Provide flashings, trim, and closure strips of the same material, thickness, and finish as used for the roofing panels. Items completely concealed after installation may optionally be made of stainless steel.

- B. Rib and Ridge Closures: Provide prefabricated, close-fitting components of steel with corrosion resistant finish, closed-cell synthetic rubber, neoprene, or PVC, or combination steel and closed-cell foam.
- C. Sealants: As specified in Section 07 90 05.
  1. Exposed sealant must cure to rubber-like consistency.
  2. Concealed sealant must be non-hardening type.
- D. Underlayment: ASTM D226/D226M roofing felt, perforated type; covered by water-resistant rosin-sized building paper.

## **2.05 FABRICATION**

- A. Panels: Fabricate panels and accessory items at factory, using manufacturer's standard processes as required to achieve specified appearance and performance requirements.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Do not begin installation of preformed metal roof panels 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. Broom clean substrate prior to installation of roofing system.
- B. Coordinate roofing work with provisions for roof drainage, flashing, trim, penetrations, and other adjoining work to assure that the completed roof will be free of leaks.
- C. Remove protective film from surface of roof panels immediately prior to installation. Strip film carefully, to avoid damage to prefinished surfaces.
- D. Separate dissimilar metals by applying a bituminous coating, self-adhering rubberized asphalt sheet, or other permanent method approved by roof panel manufacturer.
- E. Where metal will be in contact with wood or other absorbent material subject to wetting, seal joints with sealing compound and apply one coat of heavy-bodied bituminous paint.

### **3.03 INSTALLATION**

- A. Overall: Install roofing system in accordance with approved shop drawings and panel manufacturer's instructions and recommendations, as applicable to specific project conditions. Anchor all components of roofing system securely in place while allowing for thermal and structural movement.
  1. Install roofing system with concealed clips and fasteners, except as otherwise recommended by manufacturer for specific circumstances.
  2. Minimize field cutting of panels. Where field cutting is absolutely required, use methods that will not distort panel profiles. Use of torches for field cutting is absolutely prohibited.
- B. Accessories: Install all components required for a complete roofing assembly, including flashings, gutters, downspouts, trim, moldings, closure strips, preformed crickets, caps, equipment curbs, rib closures, ridge closures, and similar roof accessory items.
- C. Install roofing felt and building paper slip sheet on roof deck before installing preformed metal roof panels. Secure by methods acceptable to roof panel manufacturer, minimizing use of metal fasteners. Apply from eaves to ridge in shingle fashion, overlapping horizontal joints a minimum of 2 inches and side and end laps a minimum of 3 inches. Offset seams in building paper and seams in roofing felt.

- D. Roof Panels: Install panels in strict accordance with manufacturer's instructions, minimizing transverse joints except at junction with penetrations.
  - 1. Provide sealant tape or other approved joint sealer at lapped panel joints.
  - 2. Install sealant or sealant tape, as recommended by panel manufacturer, at end laps and side joints.

**3.04 CLEANING**

- A. Clean exposed sheet metal work at completion of installation. Remove grease and oil films, excess joint sealer, handling marks, and debris from installation, leaving the work clean and unmarked, free from dents, creases, waves, scratch marks, or other damage to the finish.

**3.05 PROTECTION**

- A. Do not permit storage of materials or roof traffic on installed roof panels. Provide temporary walkways or planks as necessary to avoid damage to completed work. Protect roofing until completion of project.
- B. Touch-up, repair, or replace damaged roof panels or accessories before date of Substantial Completion.

**END OF SECTION**

## METAL WALL PANELS

### PART 1 GENERAL

#### 1.01 SECTION INCLUDES

- A. Manufactured metal panels for walls (MWP), with related flashings and accessory components.

#### 1.02 RELATED REQUIREMENTS

- A. Section 05 40 00 - Cold-Formed Metal Framing: Wall framing and furring.
- B. Section 07 21 00 - Thermal Insulation.
- C. Section 07 25 00 - Weather Barriers: Weather barrier under wall panels.
- D. Section 07 42 13.16 - Metal Plate Wall Panels: Solid aluminum wall panel siding.
- E. Section 07 42 13.23 - Metal Composite Material Wall Panels: MCM wall panel siding.
- F. Section 07 90 05 - Joint Sealers.
- G. Section 09 21 16 - Gypsum Board Assemblies: Wall panel substrate.

#### 1.03 REFERENCE STANDARDS

- A. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2013.
- B. ASTM A792/A792M - Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process; 2010.

#### 1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Indicate dimensions, layout, joints, construction details, methods of anchorage.
- C. Samples: Submit two samples of wall panel, 4 by 12 inch in size illustrating finish color, sheen, and texture.
- D. Warranty: Submit specified manufacturer's warranty and ensure that forms have been completed in Owner's name and are registered with manufacturer.

#### 1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum five years of documented experience.
- B. Installer Qualifications: Company specializing in installing the products specified in this section with minimum three years of documented experience.

#### 1.06 MOCK-UP

- A. Provide a mock-up for evaluation of fabrication workmanship.
- B. Locate where directed.
- C. Mock-up may remain as part of the Work.

#### 1.07 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.

**1.08 WARRANTY**

- A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.
- B. Correct defective work within a five year period after Substantial Completion for degradation of panel finish, including color fading caused by exposure to weather.
- C. Correct defective Work within a five year period after Substantial Completion, including defects in water tightness and integrity of seals.
- D. Panel Finish: Provide finish manufacturer's standard 20-year product warranty.

**PART 2 PRODUCTS****2.01 MANUFACTURERS**

- A. Morin Corp; Product C-F Series Concealed Fastened Panels W-12: [www.morincorp.com](http://www.morincorp.com).
- B. Other Acceptable Manufacturers:
  - 1. Substitutions: See Section 01 60 00 - Product Requirements.

**2.02 MANUFACTURED METAL PANELS**

- A. 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.
  - 3. Maximum Allowable Deflection of Panel: 1/90 of span.
  - 4. 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.
  - 5. Drainage: Provide positive drainage to exterior for moisture entering or condensation occurring within panel system.
  - 6. Fabrication: Formed true to shape, accurate in size, square, and free from distortion or defects; pieces of longest practical lengths.
  - 7. Exterior Finish: Panel manufacturer's standard polyvinylidene fluoride (PVDF) coating, top coat over epoxy primer.
  - 8. Exterior Panel Back Coating: Panel manufacturer's standard polyester wash coat.
  - 9. Form panels in lengths to avoid end laps; end laps are not permitted.
- B. Exterior Panels:
  - 1. Profile: Vertical; vee configuration.
  - 2. Side Seams: Double-interlocked, tight-fitting, sealed with continuous gaskets; female ends with field or factory installed sealant.
  - 3. Material: Precoated galvalume/zincalume sheet, 20 gage, 0.0359 inch minimum thickness.
  - 4. Panel Width: Nominal 12 inches exposed.
  - 5. Panel Depth: 1-1/2 inch.
  - 6. Color: To match Silversmith (Mica) by Morin (Valspar).
  - 7. Fastener Type: Concealed.
- C. Hat Channel Furring: ASTM A653/M653 galvanized sheet steel, G90/Z275 galvanized coating; gage as required by manufacturer to suit application.
- D. Internal and External Corners: Same material, thickness, and finish as exterior sheets; profile to suit system; shop cut and factory mitered to required angles.
- E. Expansion Joints: Same material, thickness and finish as exterior sheets; manufacturer's standard brake formed type, of profile to suit system.
- F. Trim: Same material, thickness and finish as exterior sheets; brake formed to required profiles.
- G. Anchors: Galvanized steel.

**2.03 MATERIALS**

- A. Precoated Steel Sheet: Aluminum-zinc alloy-coated steel sheet, ASTM A792/A792M, Commercial Steel (CS) or Forming Steel (FS), with AZ50/AZM150 coating; continuous-coil-coated on exposed surfaces with specified finish coating and on panel back with specified panel back coating.
- B. Panel Back Coating: Panel manufacturer's standard acrylic wash coat.

**2.04 ACCESSORIES**

- A. Closure Strips: manufacturer's standard die-cut foam, profile to match siding; nominal 2 inch wide.
- B. Sealants: Specified in Section 07 90 05. Approved by panel manufacturer, type suitable for use with installation of system; non-staining; color as selected.
- C. Fasteners: Manufacturer's standard type to suit application; steel, hot dip galvanized. Exposed fasteners same finish as panel system.
- D. Field Touch-up Paint: As recommended by panel manufacturer.
- E. Bug Screen: Semi-rigid open-weave polyester mesh; 1/2 inch thick x 48 inch lengths; black color.

**PART 3 EXECUTION****3.01 EXAMINATION**

- A. Verify that building framing members and sheathing are ready to receive panels.
- B. Verify that weather barrier has been installed over substrate completely and correctly.

**3.02 PREPARATION****3.03 INSTALLATION**

- A. Install panels on walls in accordance with manufacturer's instructions.
- B. Do not stretch or compress panel side-laps.
- C. Secure panels without warp or deflection.
- D. Fasten panels to structural supports; aligned, level, and plumb.
- E. Provide expansion joints where indicated.
- F. Use concealed fasteners unless otherwise approved by Architect. Exposed fasteners to following layout indicated on approved shop drawings.
- G. Install joint fillers and sealants where indicated and where required for weather-resistant performance of panel wall assembly.
- H. Seal and place gaskets and closure strips to prevent weather penetration. Maintain neat appearance.

**3.04 CUTTING AND FITTING**

- A. Cutting: Cut neat, square and true.
- B. Openings: Shop fabricate openings 6 inch and larger.

**3.05 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.



**3.06 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**

## **METAL PLATE WALL PANELS**

### **PART 1 GENERAL**

#### **1.01 SECTION INCLUDES**

- A. Manufactured metal plate panels for walls (MPWP), with related flashings and accessory components.

#### **1.02 RELATED REQUIREMENTS**

- A. Section 05 40 00 - Cold-Formed Metal Framing: Wall framing and furring.
- B. Section 07 21 00 - Thermal Insulation: Insulation under wall panels.
- C. Section 07 25 00 - Weather Barriers: Weather barrier under wall panels.
- D. Section 07 42 13 - Metal Wall Panels: Pre-formed metal wall panels.
- E. Section 07 42 13.23 - Metal Composite Material Wall Panels: MCM wall panel siding.
- F. Section 07 90 05 - Joint Sealers.
- G. Section 09 21 16 - Gypsum Board Assemblies: Wall panel substrate.

#### **1.03 REFERENCE STANDARDS**

- A. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2010.
- B. ASTM B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate [Metric]; 2010.

#### **1.04 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Indicate dimensions, layout, joints, construction details, methods of anchorage.
- C. Samples: Submit two samples of wall panel, 4 by 12 inch in size illustrating finish color, sheen, and texture.
- D. Warranty: Submit specified manufacturer's warranty and ensure that forms have been completed in Owner's name and are registered with manufacturer.

#### **1.05 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum five years of documented experience.
- B. Installer Qualifications: Company specializing in installing the products specified in this section with minimum three years of documented experience.

#### **1.06 MOCK-UP**

- A. Provide a mock-up for evaluation of fabrication workmanship.
- B. Locate where directed.
- C. Mock-up may remain as part of the Work.

#### **1.07 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.

**1.08 WARRANTY**

- A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.
- B. Wall System Warranty: Provide joint written warranty by manufacturer and installer, agreeing to correct defects in manufacturing or installation within a two year period after Date of Substantial Completion.
- C. Manufacturer's Finish Warranty: Provide manufacturer's written warranty stating that the finish will perform as follows for minimum of 20 years:
  - 1. Chalking: No more than that represented by a No.8 rating based on ASTM D4214.
  - 2. Color Retention: No fading or color change in excess of 5 Hunter color difference units, calculated in accordance with ASTM D2244.
  - 3. Gloss Retention: Minimum of 30 percent gloss retention, when tested in accordance with ASTM D523.

**PART 2 PRODUCTS****2.01 MANUFACTURERS**

- A. Basis of Design: Firestone Building Products Co;; Product Aluminum Plate Wall System - S3200 Rainscreen System: [www.firestonebpc.com](http://www.firestonebpc.com).
- B. Other Acceptable Manufacturers:
  - 1. Skyline Sheet Metal Co; SSMPER-X Rainscreen System; [www.skylinesheetmetal.com](http://www.skylinesheetmetal.com).
  - 2. Substitutions: See Section 01 60 00 - Product Requirements.

**2.02 MANUFACTURED METAL PANELS**

- A. Wall Panel System: Factory finished metal panel system, site assembled; subgirts, fasteners, and anchors designed to be supported by framing or other substrate provided by others; provide installed panel system capable of maintaining specified performance without defects, damage or failure.
  - 1. Provide structural design by or under direct supervision of a Structural Engineer licensed in Oregon.
  - 2. Provide panel jointing and weatherseal using reveal joints and gaskets but no sealant.
  - 3. Anchor panels to supporting framing without exposed fasteners.
- B. Performance Requirements:
  - 1. Pressure equalized rainscreen system.
  - 2. Design and size components to withstand dead and live loads caused by positive and negative wind pressure acting normal to plane of wall.
  - 3. Design Pressure: In accordance with applicable codes.
  - 4. Maximum Allowable Deflection of Panel: 1/90 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 12 inch returns or as indicated on Drawings.
  - 9. Exterior Finish: Panel manufacturer's standard polyvinylidene fluoride (PVDF) coating, top coat over epoxy primer.
  - 10. Exterior Panel Back Coating: Panel manufacturer's standard polyester wash coat.
  - 11. Fire Performance: Tested in accordance with, and complying with the acceptance criteria of, NFPA 285; testing performed for previous project is acceptable provided tested system was truly equivalent.

- C. Metal Plate Wall Panel (MPWP): Formed metal panel system.
  - 1. Panel:
    - a. Material: Solid aluminum, ASTM B209, 1/8 inch thickness.
    - b. Profile: Flat face with break-formed edges.
    - c. Face: Smooth.
    - d. Panel Configuration: As indicated on Drawings.
    - e. Panel Depth: 1 inch.
    - f. Color: Custom to match AYW Yellow by Alpolic.
  - 2. Fasteners: Concealed stainless steel.
- D. Frame: Extruded aluminum channel.
- E. Support Clip: Extruded aluminum.
- F. Internal and External Corners: Same material, thickness, and finish as exterior sheets; profile to suit system; brake formed to required angles.
- G. Expansion Joints: Same material, thickness and finish as exterior sheets; manufacturer's standard brake formed type, of profile to suit system.
- H. Trim: Same material, thickness and finish as exterior sheets; brake formed to required profiles.
- I. Anchors: Stainless steel.

### **2.03 MATERIALS**

- A. Precoated Aluminum Sheet: ASTM B209 (ASTM B209M), 3105 alloy, O temper, smooth surface texture; continuous-coil-coated on exposed surfaces with specified finish coating and on panel back with specified panel back coating.
- B. Panel Back Coating: Panel manufacturer's standard acrylic wash coat.

### **2.04 ACCESSORIES**

- A. Fasteners: Manufacturer's standard type to suit application; stainless steel. Exposed fasteners same finish as panel system.
- B. Field Touch-up Paint: As recommended by panel manufacturer.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify that building framing members and sheathing are ready to receive panels.
- B. Verify that weather barrier has been installed over substrate completely and correctly.

### **3.02 INSTALLATION**

- A. Install panels on walls in accordance with manufacturer's instructions.
- B. Do not stretch or compress panel side-laps.
- C. Secure panels without warp or deflection.
- D. Fasten panels to structural supports; aligned, level, and plumb.
- E. Provide expansion joints where indicated.
- F. Use concealed fasteners unless otherwise approved by Architect. Exposed fasteners to following layout indicated on approved shop drawings.
- G. Install joint fillers and sealants where indicated and where required for weather-resistant performance of panel wall assembly.

- H. Seal and place gaskets and closure strips to prevent weather penetration. Maintain neat appearance.

**3.03 CUTTING AND FITTING**

- A. Cutting: Cut neat, square and true.
- B. Openings: Shop fabricate openings 6 inch and larger.

**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**

**METAL COMPOSITE MATERIAL WALL PANELS****PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Exterior cladding consisting of formed metal composite material (MCM) sheet, secondary supports, and anchors to structure, attached to solid backup.
- B. Matching flashing and trim.

**1.02 RELATED REQUIREMENTS**

- A. Section 05 40 00 - Cold Framed Metal Framing: Panel support framing and furring.
- B. Section 07 42 13 - Metal Wall Panels: Pre-formed metal panel siding.
- C. Section 07 42 13.16 - Metal Plate Wall Panels: Solid aluminum panel siding.
- D. Section 07 62 00 - Sheet Metal Flashing and Trim: Metal flashing components integrated with this wall system.
- E. Section 07 90 05 - Joint Sealers.

**1.03 REFERENCE STANDARDS**

- A. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2012.
- B. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2013.
- C. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2009.
- D. ASTM A276 - Standard Specification for Stainless Steel Bars and Shapes; 2013a.
- E. ASTM A480/A480M - Standard Specification for General Requirements for Flat-Rolled Stainless and Heat-Resisting Steel Plate, Sheet, and Strip; 2014.
- F. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2010.
- G. ASTM D523 - Standard Test Method for Specular Gloss; 2008.
- H. ASTM D1781 - Standard Test Method for Climbing Drum Peel for Adhesives; 1998 (Reapproved 2012).
- I. ASTM D1929 - Standard Test Method for Determining Ignition Temperature of Plastics; 2013a.
- J. ASTM D2244 - Standard Practice for Calculation of Color Differences from Instrumentally Measured Color Coordinates; 2011.
- K. ASTM D4145 - Standard Test Method for Coating Flexibility of Prepainted Sheet; 2010.
- L. ASTM D4214 - Standard Test Methods for Evaluating the Degree of Chalking of Exterior Paint Films; 2007.
- M. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2014.
- N. NFPA 285 - Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Non-Load-Bearing Wall Assemblies Containing Combustible Components; 2012.

**1.04 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Wall System Manufacturer Qualifications.

- C. Product Data - MCM Sheets: Manufacturer's data sheets on each product to be used, including thickness, physical characteristics, and finish, and:
  - 1. Finish manufacturer's data sheet showing physical and performance characteristics.
  - 2. Storage and handling requirements and recommendations.
  - 3. Fabrication instructions and recommendations.
  - 4. Specimen warranty for finish, as specified herein.
- D. Product Data - Wall System: Manufacturer's data sheets on each product to be used, including:
  - 1. Physical characteristics of components shown on shop drawings.
  - 2. Storage and handling requirements and recommendations.
  - 3. Installation instructions and recommendations.
  - 4. Specimen warranty for wall system, as specified herein.
- E. Shop Drawings: Show layout and elevations, dimensions and thickness of panels, connections, details and location of joints, sealants and gaskets, method of anchorage, number of anchors, supports, reinforcement, trim, flashings, and accessories.
  - 1. Indicate panel numbering system.
  - 2. Differentiate between shop and field fabrication.
  - 3. Indicate substrates and adjacent work with which the wall system must be coordinated.
  - 4. Include large-scale details of anchorages and connecting elements.
  - 5. Include large-scale details or schematic, exploded or isometric diagrams to fully explain flashing at a scale of not less than 1-1/2 inches per 12 inches.
  - 6. Include design engineer's stamp or seal on shop drawings for attachments and anchors.
- F. Design Data: Submit structural calculations stamped by design engineer, for Architect's information and project record.
- G. Verification Samples: For each finish product specified, minimum size 12 inches square, representing actual product in color and texture.
- H. Test Report: Submit report of full-size mock-up test for NFPA 285 fire performance.
- I. Maintenance Data: Care of finishes and warranty requirements.
- J. Executed Warranty: Submit warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

#### **1.05 QUALITY ASSURANCE**

- A. Design Engineer's Qualifications: Design structural supports and anchorages under direct supervision of a Structural Engineer experienced in design of this type of Work and licensed in Oregon.
- B. Wall System Manufacturer Qualifications: Company specializing in manufacturing products specified in this section.
  - 1. With not less than three years of documented experience.
- C. Installer Qualifications: Company specializing in performing work of the type specified in this section.
  - 1. With minimum 3 years of documented experience.
  - 2. Approved by wall system manufacturer.
- D. Mock-Up: Provide a mock-up for evaluation of fabrication workmanship.
  - 1. Locate where directed.
  - 2. Provide panels finished as specified.
  - 3. Mock-up may remain as part of the Work.

#### **1.06 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver products in manufacturer's original, unopened, undamaged containers with identification labels intact.
  - 1. Protect finishes by applying heavy duty removable plastic film during production.

2. Package for protection against transportation damage.
  3. Provide markings to identify components consistently with drawings.
  4. Exercise care in unloading, storing and installing panels to prevent bending, warping, twisting and surface damage.
- B. Store products protected from exposure to harmful weather conditions and at temperature conditions recommended by manufacturer.
1. Store in well ventilated space out of direct sunlight.
  2. Protect from moisture and condensation with tarpaulins or other suitable weather tight covering installed to provide ventilation.
  3. Store at a slope to ensure positive drainage of any accumulated water.
  4. Do not store in any enclosed space where ambient temperature can exceed 120 degrees F.
  5. Avoid contact with any other materials that might cause staining, denting, or other surface damage.

### 1.07 WARRANTY

- A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.
- B. Wall System Warranty: Provide joint written warranty by manufacturer and installer, agreeing to correct defects in manufacturing or installation within a two year period after Date of Substantial Completion.
- C. MCM Sheet Manufacturer's Finish Warranty: Provide manufacturer's written warranty stating that the finish will perform as follows for minimum of 20 years:
1. Chalking: No more than that represented by a No.8 rating based on ASTM D4214.
  2. Color Retention: No fading or color change in excess of 5 Hunter color difference units, calculated in accordance with ASTM D2244.
  3. Gloss Retention: Minimum of 30 percent gloss retention, when tested in accordance with ASTM D523.

## PART 2 PRODUCTS

### 2.01 MANUFACTURERS

- A. Basis of Design: ALPOLIC Materials; ALPOLIC / fr (fire resistant core) Rain Screen System: [www.alpolic-usa.com](http://www.alpolic-usa.com).
- B. Other Acceptable Products:
1. Firestone Building Products Co; MCM-S3200 System: [www.firestonebpco.com](http://www.firestonebpco.com).
  2. Northclad Rainscreen Solutions; Northclad ACM Aluminum Composite Panel Rainscreen System: [www.northclad.com](http://www.northclad.com).
  3. Skyline Sheet Metal, Inc; SSMPEX-X System: [www.skylinesheetmetal.com](http://www.skylinesheetmetal.com).
  4. Substitutions: See Section 01 60 00 - Product Requirements.

### 2.02 WALL PANEL SYSTEM

- A. Wall Panel System: Metal panels, fasteners, and anchors designed to be supported by framing or other substrate provided by others; provide installed panel system capable of maintaining specified performance without defects, damage or failure.
1. Provide structural design by or under direct supervision of a Structural Engineer licensed in Oregon.
  2. Provide panel jointing and weatherseal using reveal joints and gaskets but no sealant.
  3. Anchor panels to supporting framing without exposed fasteners.
- B. Performance Requirements:
1. Thermal Movement: Provide for free and noiseless vertical and horizontal thermal movement due to expansion and contraction under material temperature range of minus 20 degrees F to 180 degrees F without buckling, opening of joints, undue stress on fasteners, or other detrimental effects; allow for ambient temperature at time of fabrication, assembly, and erection procedures.



2. Wind Performance: Provide system tested in accordance with ASTM E330/E330M without permanent deformation or failures of structural members under the following conditions:
    - a. Design Wind Pressure: As specified in As required by Code.
  3. Fire Performance: Tested in accordance with, and complying with the acceptance criteria of, NFPA 285; testing performed for previous project is acceptable provided tested system was truly equivalent.
- C. Panels: One inch deep pans formed of metal composite material sheet by routing back edges of sheet, removing corners, and folding edges.
1. Reinforce corners with riveted aluminum angles.
  2. Provide concealed attachment to supporting structure by adhering attachment members to back of panel; attachment members may also function as stiffeners.
  3. Maintain maximum panel bow of 0.8 percent of panel dimension in width and length; provide stiffeners of sufficient size and strength to maintain panel flatness without showing local stresses or read-through on panel face.
  4. Secure members to back face of panels using structural silicone sealant approved by MCM sheet manufacturer.
  5. Fabricate panels under controlled shop conditions.
  6. Where final dimensions cannot be established by field measurement before commencement of manufacturing, make allowance for field adjustments without requiring field fabrication of panels.
  7. Fabricate as indicated on drawings and as recommended by MCM sheet manufacturer.
    - a. Make panel lines, breaks, curves and angles sharp and true.
    - b. Keep plane surfaces free from warp or buckle.
    - c. Keep panel surfaces free of scratches or marks caused during fabrication.
  8. Provide joint details providing a watertight and structurally sound wall panel system that allows no uncontrolled water penetration on inside face of panel system.
  9. For "dry" jointing, secure extrusions to returned pan edges with stainless steel rivets; provide means of concealed drainage with baffles and weeps for water that might accumulate in members of system.

### 2.03 MATERIALS

- A. Metal Composite Material (MCM) Sheet: Two sheets of aluminum sandwiching a solid core of extruded thermoplastic material formed in a continuous process with no glues or adhesives between dissimilar materials; core material free of voids and spaces; no foamed insulation material content.
1. Overall Sheet Thickness: 4 mm.
  2. Face Sheet Thickness: 0.019 inches, minimum.
  3. Alloy: Manufacturer's standard, selected for best appearance and finish durability.
  4. Bond and Peel Strength: No adhesive failure of the bond between the core and the skin nor cohesive failure of the core itself below 22.4 inch-pound/inch with no degradation in bond performance, when tested in accordance with ASTM D1781, simulating resistance to panel delamination, after 8 hours of submersion in boiling water and after 21 days of immersion in water at 70 degrees F.
  5. Surface Burning Characteristics: Flame spread index of 25, maximum; smoke developed index of 450, maximum; when tested in accordance with ASTM E84.
  6. Flammability: Self-ignition temperature of 650 degrees F or greater, when tested in accordance with ASTM D1929.
  7. Factory Finish: Two coat fluoropolymer resin coating, approved by the coating manufacturer for the length of warranty specified for the project, and applied by coil manufacturing facility that specializes in coil applied finishes.
    - a. Coating Flexibility: Pass ASTM D4145 minimum 1T-bend, at time of manufacturing.
  8. Color: To match ABE Blue by Alpolic.
- B. Flashing: Sheet aluminum; 0.040 inch thick, minimum; finish and color to match MCM sheet.
- C. Anchors, Clips and Accessories: Use one of the following:
1. Stainless steel complying with ASTM A480/A480M, ASTM A276 or ASTM A666.

2. Steel complying with ASTM A36/A36M and hot-dipped galvanized to ASTM A153/A153M.
  3. Steel complying with ASTM A36/A36M and hot-dipped galvanized to ASTM A123/A123M Coating Grade 10.
- D. Fasteners:
1. Exposed fasteners: Stainless steel; permitted only where absolutely unavoidable and subject to prior approval of the Architect.
  2. Screws: Self-drilling or self-tapping Type 410 stainless steel or zinc-alloy steel hex washer head, with EPDM or PVC washer under heads of fasteners bearing on weather side of metal wall panels.
  3. Bolts: Stainless steel.
  4. Fasteners for Flashing and Trim: Blind fasteners of high-strength aluminum or stainless steel.
- E. Joint Sealer: As specified in Section 07 90 05, subject to MCM sheet manufacturer's approval.
- F. Provide panel system manufacturer's and installer's standard corrosion resistant accessories, including fasteners, clips, anchorage devices and attachments.

### **PART 3 EXECUTION**

#### **3.01 EXAMINATION**

- A. Verify dimensions, tolerances, and interfaces with other work.
- B. Verify substrate on-site to determine that conditions are acceptable for product installation in accordance with manufacturers written instructions.
- C. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
- D. Notify Architect in writing of conditions detrimental to proper and timely completion of work. Do not proceed with erection until unsatisfactory conditions have been corrected.

#### **3.02 PREPARATION**

- A. Protect adjacent work areas and finish surfaces from damage during installation.

#### **3.03 INSTALLATION**

- A. Do not install products that are defective, including warped, bowed, dented, and broken members, and members with damaged finishes.
- B. Comply with instructions and recommendations of MCM sheet manufacturer and wall system manufacturer, as well as with approved shop drawings.
- C. Install wall system securely allowing for necessary thermal and structural movement; comply with wall system manufacturer's instructions for installation of concealed fasteners.
- D. Do not handle or tool products during erection in manner that damages finish, decreases strength, or results in visual imperfection or failure in performance. Return component parts that require alteration to shop for refabrication, if possible, or for replacement with new parts.
- E. Do not form panels in field unless required by wall system manufacturer and approved by the Architect; comply with MCM sheet manufacturer's instructions and recommendations for field forming.
- F. Separate dissimilar metals; use gasket fasteners, isolation shims, or isolation tape where needed to eliminate possibility of electrolytic action between metals.
- G. Install flashings as indicated on shop drawings At flashing butt joints, provide a lap strap under flashing and seal lapped surfaces with a full bed of non-hardening sealant.
- H. Install square, plumb, straight, and true, accurately fitted, with tight joints and intersections maintaining the following installation tolerances:

1. Variation From Plane or Location: 1/2 inch in 30 feet of length and up to 3/4 inch in 300 feet, maximum.
2. Deviation of Vertical Member From True Line: 0.1 inch in 25 feet run, maximum.
3. Deviation of Horizontal Member From True Line: 0.1 inch in 25 feet run, maximum.
4. Offset From True Alignment Between Two Adjacent Members Abutting End To End, In Line: 0.03 inch, maximum.

- I. Replace damaged products.

**3.04 CLEANING**

- A. Ensure weep holes and drainage channels are unobstructed and free of dirt and sealants.
- B. Remove protective film after installation of joint sealers, after cleaning of adjacent materials, and immediately prior to completion of work.
- C. Remove temporary coverings and protection of adjacent work areas.
- D. Clean installed products in accordance with manufacturer's instructions.

**3.05 PROTECTION**

- A. Protect installed panel system from damage during construction.

**END OF SECTION**

**THERMOPLASTIC MEMBRANE ROOFING****PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Adhered system with thermoplastic roofing membrane.
- B. Insulation, flat and tapered.
- C. Flashings.
- D. Roofing cant strips, stack boots, roofing expansion joints, and walkway pads.

**1.02 RELATED REQUIREMENTS**

- A. Section 01 23 00 - Alternates: Description of Alternates.
- B. Section 05 31 00 - Metal Decking: Roof substrate.
- C. Section 06 10 00 - Rough Carpentry: Wood substrate, nailers and curbs.
- D. Section 07 25 00 - Weather Barriers: Vapor retarder in roof system.
- E. Section 08 62 00 - Unit Skylights: Skylight frame, integral curb, and counterflashing.

**1.03 REFERENCE STANDARDS**

- A. ASTM C1289 - Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board; 2014.
- B. ASTM C1396/C1396M - Standard Specification for Gypsum Board; 2014.
- C. ASTM D6878/D6878M - Standard Specification for Thermoplastic Polyolefin Based Sheet Roofing; 2011a.
- D. FM DS 1-28 - Wind Design; Factory Mutual Research Corporation; 2007.
- E. NRCA ML104 - The NRCA Roofing and Waterproofing Manual; National Roofing Contractors Association; Fifth Edition, with interim updates.
- F. UL (RMSD) - Roofing Materials and Systems 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 indicating membrane materials, flashing materials, insulation, surfacing, and fasteners.
- C. Specimen Warranty: For approval.
- D. Shop Drawings: Indicate joint or termination detail conditions, conditions of interface with other materials, and setting plan for tapered insulation.
- E. Manufacturer's Installation Instructions: Indicate membrane seaming precautions and perimeter conditions requiring special attention.
- F. Manufacturer's Field Reports: Indicate procedures followed, ambient temperatures, humidity, wind velocity during application, and supplementary instructions given.
- G. Warranty:
  - 1. Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.
  - 2. Submit installer's certification that installation complies with all warranty conditions for the waterproof membrane.

**1.05 QUALITY ASSURANCE**

- A. Perform work in accordance with NRCA Roofing and Waterproofing Manual.
- B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years of documented experience.
- C. Installer Qualifications: Company specializing in performing the work of this section:
  - 1. With minimum three years documented experience.
  - 2. Approved by membrane manufacturer.

**1.06 PRE-INSTALLATION MEETING**

- A. Convene one week before starting work of this section.
- B. Review preparation and installation procedures and coordinating and scheduling required with related work.

**1.07 MOCK-UP**

- A. Provide a mock-up of the seismic joint at parapet and roof condition for evaluation of fabrication workmanship.
- B. Locate where directed.
- C. Mock-up may remain as part of the Work.

**1.08 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.

**1.09 WARRANTY**

- A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.
- B. System Warranty: Provide manufacturer's system warranty agreeing to repair or replace roofing that leaks or is damaged due to wind or other natural causes.
  - 1. Warranty Term: 20 years.
  - 2. For repair and replacement include costs of both material and labor in warranty.

**PART 2 PRODUCTS**

**2.01 MANUFACTURERS**

- A. Thermoplastic Polyolefin Membrane Materials:
  - 1. Carlisle Roofing Systems, Inc; FleeceBACK Fully Adhered TPO: [www.carlisle-syntec.com](http://www.carlisle-syntec.com).
  - 2. Firestone Building Products, LLC; UltraPly TPO XR 115: [www.firestonebpc.com](http://www.firestonebpc.com).
  - 3. GAF; EverGuard Extreme TPO 60 Fleeceback: [www.gaf.com](http://www.gaf.com).
  - 4. Johns Manville; TPO FB115: [www.jm.com](http://www.jm.com).
  - 5. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Insulation:
  - 1. Substitutions: See Section 01 60 00 - Product Requirements.

**2.02 ROOFING**

- A. Thermoplastic Membrane Roofing: One ply membrane, fully adhered, over vapor retarder and insulation.
- B. Roofing Assembly Requirements:
  - 1. Roof Covering External Fire-Resistance Classification: UL Class A.

2. Factory Mutual Classification: Class I and windstorm resistance of I-90, in accordance with FM DS 1-28.
  3. Insulation Thermal Value (LTTR), minimum: 27; provide insulation of thickness required.
- C. Acceptable Insulation Types - Constant Thickness Application:
1. Minimum 2 layers of polyisocyanurate board.
- D. Acceptable Insulation Types - Tapered Application:
1. Uniform thickness polyisocyanurate board covered with tapered polyisocyanurate board.

### **2.03 ROOFING MEMBRANE AND ASSOCIATED MATERIALS**

- A. Membrane:
1. Material: Thermoplastic polyolefin (TPO) complying with ASTM D6878.
  2. Reinforcing: Internal fabric with 9 oz. felt backing (except at vertical surfaces).
  3. Thickness: 0.060 inch, minimum.
  4. Sheet Width: Factory fabricated into largest sheets possible.
  5. Color: Light gray.
- B. Seaming Materials: As recommended by membrane manufacturer.
- C. Flexible Flashing Material: Material recommended by membrane manufacturer.
- D. Adhesive Cover Tape: Thermoplastic polyolefin membrane with 30-mil thick factory-applied peel and stick adhesive tape; approved by membrane manufacturer.
- E. Membrane Primer: As recommended by membrane manufacturer.
- F. Surface Conditioner: As recommended by membrane and adhesive manufacturers.

### **2.04 DECK SHEATHING AND COVER BOARDS**

- A. Deck Sheathing: Gypsum sheathing, ASTM C1396/C1396M, Type X special fire-resistant type, paper face, 5/8 inch thick.
- B. Cover Board: Gypsum hardboard with glass-mat facers and pre-primed surface on back side, 1/4 inch thick.
1. Dens-Deck Prime by G-P Gypsum: [www.gp.com](http://www.gp.com).
  2. Substitutions: See Section 01 60 00 - Product Requirements.

### **2.05 INSULATION**

- A. Polyisocyanurate Board Insulation: Rigid cellular foam, complying with ASTM C1289, Type II, Class 1, cellulose felt or glass fiber mat both faces; Grade 1 and with the following characteristics:
1. Compressive Strength: 20 psi
  2. Board Size: 48 x 96 inch.
  3. Board Thickness: As required to achieve specified R-value.
  4. Tapered Board: Slope as indicated; minimum thickness 1/4, 1/2 and 1 inches per foot as indicated on Drawings; fabricate of fewest layers possible.
  5. Thermal Resistance: R-value of 30, long term thermal resistance (LTTR) of 27.
  6. Board Edges: Square.
  7. Manufacturer: Approved by roof membrane manufacturer.

### **2.06 FLASHING COMPONENTS**

- A. Flexible Flashing: Membrane adhered to using approved adhesive; non-felt backed at vertical surfaces.
- B. Membrane-Clad Metal Flashing: TPO-coated, heat-weldable sheet metal; 24 gage galvanized steel metal with 20 mil unsupported TPO membrane laminated to one face; profiles as indicated on Drawings.

- C. Membrane-Clad Metal Scupper: TPO-coated, heat-weldable sheet metal, 24 gage galvanized steel metal with 20 mil unsupported TPO membrane laminated to one face; profile as indicated on Drawings.
- D. Crimp-On Metal Fascia: TPO-coated, heat-weldable sheet metal; 24 gage galvanized steel metal with 20 mil unsupported TPO membrane laminated to one face; profiles as indicated on Drawings.
- E. Continuous Metal Cleat: Galvanized sheet metal, 24 gage, formed edge to accept roof edge and coping.

## **2.07 ACCESSORIES**

- A. Stack Boots: Prefabricated flexible boot and collar for pipe stacks through membrane; same material as membrane.
- B. Sheathing Joint Tape: Heat resistant type, 4 inch wide, self adhering.
- C. Insulation Fasteners: Appropriate for purpose intended and approved by roofing manufacturer.
  1. Length as required for thickness of insulation material and penetration of deck substrate, with metal washers.
- D. Membrane Adhesive: As recommended by membrane manufacturer.
- E. Sealant: Recommended by membrane manufacturer.
- F. Insulation Adhesive: As recommended by insulation manufacturer.
- G. Expansion Joints (Wall to Roof): Compatible with roof system, L profile, vertical leg at wall, horizontal leg at roof surface, flexible domed connection, 3 inch clear clear, batt insulation.
- H. Walkway Pads: Polyester or fiberglass reinforced, 0.096 inch thick, weldable TPO membrane with surface embossment.
  1. Composition: Roofing membrane manufacturer's standard.
  2. Size: 24 x 24 inch.
  3. Surface Color: As selected.

## **PART 3 EXECUTION**

### **3.01 INSTALLATION - GENERAL**

- A. Perform work in accordance with NRCA Roofing and Waterproofing Manual and manufacturer's instructions.
- B. Do not apply roofing membrane during unsuitable weather.
- C. Do not apply roofing membrane when ambient temperature is outside the temperature range recommended by manufacturer.
- D. Do not apply roofing membrane to damp or frozen deck surface or when precipitation is expected or occurring.
- E. Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed the same day.

### **3.02 EXAMINATION**

- A. Verify that surfaces and site conditions are ready to receive work.
- B. Verify deck is supported and secure.
- C. Verify deck is clean and smooth, flat, free of depressions, waves, or projections, properly sloped and suitable for installation of roof system.
- D. Verify deck surfaces are dry and free of snow or ice.

- E. Verify that roof openings, curbs, and penetrations through roof are solidly set, and nailing strips and reglets are in place.

**3.03 WOOD DECK PREPARATION**

- A. Verify flatness and tightness of joints of wood decking. Fill knot holes with latex filler.
- B. Confirm dry deck by moisture meter with 12 percent moisture maximum.

**3.04 METAL DECK PREPARATION**

- A. Install deck sheathing on metal deck:
  1. Lay with long side at right angle to flutes; stagger end joints; provide support at ends.
  2. Cut sheathing cleanly and accurately at roof breaks and protrusions to provide smooth surface.
  3. Tape joints.
  4. Mechanically fasten sheathing to roof deck, in accordance with Factory Mutual recommendations and roofing manufacturer's instructions.

**3.05 INSULATION - UNDER MEMBRANE**

- A. Ensure vapor retarder (weather resistant barrier) is clean and dry, continuous, and ready for application of insulation.
- B. Attachment of Insulation:
  1. Mechanically fasten first layer of insulation to deck in accordance with roofing manufacturer's instructions and Factory Mutual requirements.
  2. Embed second layer of insulation into full bed of adhesive in accordance with roofing and insulation manufacturers' instructions.
- C. Lay subsequent layers of insulation with joints staggered minimum 12 inches from joints of preceding layer.
- D. Place tapered insulation to the required slope pattern in accordance with manufacturer's instructions.
- E. Lay boards with edges in moderate contact without forcing. Cut insulation to fit neatly to perimeter blocking and around penetrations through roof.
- F. Do not apply more insulation than can be covered with membrane in same day.

**3.06 COVER BOARD INSTALLATION**

- A. Install cover board over top of insulation set in low-rise foam adhesive compatible with cover board and insulation facer.
- B. Lay board with butt joints.

**3.07 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. Fully Adhered Application: Apply adhesive to substrate at rate recommended by roofing manufacturer; allow first application of adhesive to dry completely before applying a second application. Unroll membrane immediately and embed into wet adhesive. Fully embed membrane in adhesive. Do not allow second application of adhesive to dry before installing membrane.
- D. Overlap edges and ends and seal seams by contact adhesive, minimum 3 inches. Seal permanently waterproof. Apply uniform bead of sealant to joint edge.
- E. Install flashing concurrent with membrane installation.
- F. At intersections with vertical wall surfaces:



1. Extend membrane to face of wall and install, mechanically fasten as recommended by membrane manufacturer.
  2. Fully adhere flexible flashing over membrane and up to nailing strips.
- G. At intersections with vertical parapet wall surfaces:
1. Extend membrane to face of parapet wall, mechanically fasten as recommended by membrane manufacturer.
  2. Fully adhere flexible flashing over membrane, up wall, over top of parapet, and down wall face minimum 3 inches.
- H. At roof edges, gutter:
1. Extend membrane over top of wood nailer and down face of roof edge, coordinate with installation of gutter specified in Section 07 62 00.
  2. Allow gutter support straps to be installed.
  3. Install membrane-clad metal edge strips, secure to wood nailer.
  4. Install flexible flashing over membrane and metal edge, secure with adhesive.
- I. At roof edges, rake:
1. Extend membrane over top of wood nailer and down face of roof edge, mechanically attach to wood nailer.
  2. Install continuous metal cleat, mechanically attach to wood nailer at 4 inches o.c., apply sealant tape to seal front edge to roof edge.
  3. Install flexible flashing over membrane and metal edge, extend over face of metal edge cleat, secure to membrane and mechanically fasten through edge cleat to wood nailer.
  4. Install crimp-on metal fascia, set front edge into continuous cleat, field crimp secure to top of cleat.
- J. Around roof penetrations, seal flanges and flashings with flexible flashing.
- K. Coordinate installation of roof drains, sumps, and scuppers and related flashings.

**3.08 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.

**3.09 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**

**SHEET METAL FLASHING AND TRIM****PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Fabricated sheet metal items, including flashings, counterflashings, gutters, downspouts, conductor heads, scuppers, splash pans, and other items indicated in Schedule.
- B. Reglets and accessories.

**1.02 RELATED REQUIREMENTS**

- A. Section 06 10 00 - Rough Carpentry: Plywood sheathing, wood nailers.
- B. Section 07 41 13 - Metal Roof Panels: Preformed metal roofing.
- C. Section 07 42 13 - Metal Wall Panels: Metal panel siding and associated trim.
- D. Section 07 42 64 - Metal Composite Material Wall Panels: MCM siding.
- E. Section 07 54 00 - Thermoplastic Membrane Roofing: Roofing system and membrane-clad flashing and components
- F. Section 07 72 00 - Roof Accessories: Roof-mounted hatches.
- G. Section 07 90 05 - Joint Sealers.
- H. Section 08 62 00 - Unit Skylights: Metal curbs.
- I. Section 08 62 23 - Tubular Skylights: Metal curbs.

**1.03 REFERENCE STANDARDS**

- A. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels; 2013.
- B. ASTM A 53 - Standard Specification for Pipe, Steel, Black, Hot-Dipped, Zinc-Coated, Welded and Seamless.
- C. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes; 2013.
- D. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2013.
- E. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2010.
- F. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2010.
- G. ASTM B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate [Metric]; 2010.
- H. ASTM D4586/D4586M - Standard Specification for Asphalt Roof Cement, Asbestos-Free; 2007 (Reapproved 2012)e1.

**1.04 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Indicate material profile, jointing pattern, jointing details, fastening methods, flashings, terminations, and installation details.
- C. Samples: Submit two samples, 4 x 4 inch in size illustrating material of typical standing seam, external corner, and internal corner.
- D. Samples: Submit two samples 4 x 4 inch in size illustrating metal finish color.

**1.05 QUALITY ASSURANCE**

- A. Perform work in accordance with SMACNA Architectural Sheet Metal Manual and CDA Copper in Architecture Handbook requirements and standard details, except as otherwise indicated.
- B. Fabricator and Installer Qualifications: Company specializing in sheet metal work with three years of documented experience.

**1.06 MOCK-UP**

- A. Provide a mock-up of the flashing at the seismic joint at the parapet and roof condition for evaluation of fabrication workmanship.
- B. Locate where directed.
- C. Mock-up may remain as part of the Work.

**1.07 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.

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

- A. Pre-Finished Galvanized Steel: ASTM A653/A653M, with G90/Z275 zinc coating; minimum 0.03 inch thick base metal, shop pre-coated with PVDF coating.
  - 1. PVDF (Polyvinylidene Fluoride) Coating: Superior Performance Organic Finish, AAMA 2605; multiple coat, thermally cured fluoropolymer finish system.
  - 2. PVDF (Polyvinylidene Fluoride) Coating: Superior Performance Organic Finish, AAMA 2605; multiple coat, thermally cured fluoropolymer finish system; color as indicated on Drawings.
    - a. Color SM-1: To match Silversmith (Mica) specified in Section 07 42 13 - Metal Wall Panels.
    - b. Color SM-2: To match AYW Yellow specified in Section 07 42 13.16 - Metal Plate Wall Panels.
    - c. Color SM-3: To match ABE Blue specified in Section 07 42 13.16 - Metal Composite Material Wall Panels.
    - d. Color SM-4: To match Kawneer Permanodic Dark Bronze No. 40 color.
- B. Pre-Finished Aluminum: ASTM B 209 (ASTM B 209M); 0.032 inch thick; plain finish shop pre coated with fluoropolymer coating of color as selected.
  - 1. PVDF (Polyvinylidene Fluoride) Coating: Superior Performance Organic Finish, AAMA 2605; multiple coat, thermally cured fluoropolymer finish system; color as indicated on Drawings.
    - a. Color SM-1: To match Silversmith (Mica) specified in Section 07 42 13 - Metal Wall Panels.
    - b. Color SM-2: To match AYW Yellow specified in Section 07 42 13.16 - Metal Plate Wall Panels.
    - c. Color SM-3: To match ABE Blue specified in Section 07 42 13.16 - Metal Composite Material Wall Panels.
    - d. Color SM-4: To match Kawneer Permanodic Dark Bronze No. 40 color.
- C. Stainless Steel: ASTM A666 Type 304, soft temper, 0.019 inch thick; smooth No. 4 finish, unless noted otherwise.
- D. Steel Tube Downspouts: ASTM A500/A500M, Grade B cold-formed structural tubing.

**2.02 ACCESSORIES**

- A. Fasteners: Stainless steel to suit application and substrate.

- B. Primer: Galvanized iron type.
- C. Protective Backing Paint: Zinc molybdate alkyd.
- D. Sealant: Type B - MS Polymer specified in Section 07 90 05.
- E. Plastic Cement: ASTM D4586, Type I.

### **2.03 FABRICATION**

- A. Form sections true to shape, accurate in size, square, and free from distortion or defects.
- B. Form pieces in longest possible lengths.
- C. Hem exposed edges on underside 1/2 inch; miter and seam corners.
- D. Form material with flat lock seams, except where otherwise indicated. At moving joints, use sealed lapped, bayonet-type or interlocking hooked seams.
- E. Fabricate vertical faces with bottom edge formed outward 1/4 inch (6 mm) and hemmed to form drip.

### **2.04 GUTTER AND DOWNSPOUT FABRICATION**

- A. Exposed Gutters: Profile as indicated on Drawings.
  1. Fabricate in continuous lengths.
  2. Fabricate corners from one piece with minimum 18 inch long legs; seam for rigidity, seal with sealant.
  3. Provide downspout drops riveted and sealant sealed to bottom of gutter.
- B. Concealed Gutters: Profile as indicated on Drawings.
  1. Fabricate in 10 foot lengths, typical.
  2. Fabricate corners from one piece with minimum 18 inch long legs; seam for rigidity, solder seal joints watertight.
  3. Provide downspout drops solder sealed to bottom of gutter.
- C. Formed Downspouts: Profile as indicated on Drawings; from per SMACNA Figure 1-32B seam.
  1. Continuous length without joints.
- D. Parapet Wall Flashing: Form with S-lock joints as indicated on Drawings; form vertical joints with standing seam per SMACNA Figure 3-9.
- E. Accessories: Profiled to suit gutters and downspouts.
  1. Anchorage Devices: In accordance with SMACNA requirements.
  2. Gutter Supports: Brackets.
  3. Downspout Supports: Brackets.
- F. Downspout Boots: Plastic.
- G. Seal metal joints.

## **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. Back paint concealed metal surfaces with protective backing paint to a minimum dry film thickness of 15 mil.

**3.03 INSTALLATION**

- A. Secure flashings in place using concealed fasteners. Use exposed fasteners only where permitted.
- B. Apply plastic cement compound between metal flashings and felt flashings.
- 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.
- E. Scuppers / Conductor Heads:
  - 1. with installation of roofing and wall finishes.
  - 2. Field solder flange to scupper body to form water-tight seal.
  - 3. Install conductor head and seal to scupper.
- F. Downspouts:
  - 1. Secure downspouts in place using metal straps and fasteners at 36 inches on center.
  - 2. Allow for venting and expansion at connection to gutter drop.
- G. Slope gutters 1/8 inch per 10 feet, minimum.
  - 1. Secure gutters as indicated on Drawings; provide double support at last 72 inches of gutter.
  - 2. Install exposed gutters continuous; seal joints with sealant.
  - 3. Install concealed gutters with joints solder sealed.
  - 4. Connect downspouts to downspout boots. Seal connection watertight.

**3.04 SCHEDULE**

	<b>LOCATION</b>	<b>METAL TYPE</b>	<b>THICKNESS</b>	<b>FINISH</b>
A.	Metal Flashing:	Formed Prefinished Steel	22 gage	Fluoropolymer
B.	Metal Flashing (Door Jambs)	Formed Prefinished Steel	14 gage	Fluoropolymer
C.	Reglet / Flashing	Formed Prefinished Steel	22 Gage	Fluoropolymer
D.	Aluminum Flashing:	Formed Aluminum	0.032 inch	Fluoropolymer
E.	Conductor Head:	Formed Stainless Steel	0.019 inch	No. 4
F.	Scupper/Overflows:	Formed Stainless Steel	0.019 inch	No. 4
G.	Splash Pans:	Formed Stainless Steel	0.019 inch	No. 4
H.	Sill Pan Flashing:	Formed Stainless Steel	0.019 inch	No. 2
I.	Exposed Gutters:	Formed Prefinished Steel	22 gage	Fluoropolymer
J.	Concealed Gutter:	Formed Stainless Steel	0.03 inch	No. 2
K.	Downspouts at Canopies:	Galvanized Steel Tube	4 inch Square	Field Finished
L.	Downspouts:	Formed Prefinished Steel	22 gage	Fluoropolymer
M.	Perforated Flashing:	Formed Prefinished Steel	22 gage	Fluoropolymer

**END OF SECTION**

## ROOF ACCESSORIES

### PART 1 GENERAL

#### 1.01 SECTION INCLUDES

- A. Roof hatches.
- B. Snow guards.

#### 1.02 RELATED REQUIREMENTS

- A. Section 05 51 33 - Ladders: Access ladders.
- B. Section 06 10 00 - Rough Carpentry: Framing at roof openings.
- C. Section 07 41 13 - Metal Roof Panels.
- D. Section 07 54 00 - Thermoplastic Roofing: Roofing and insulation.
- E. 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/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2013.

#### 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.
  - 1. Preparation instructions and recommendations.
  - 2. Storage and handling requirements and recommendations.
  - 3. Installation methods.
  - 4. Maintenance requirements.

#### 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.

### PART 2 PRODUCTS

#### 2.01 ROOF HATCHES

- A. Manufactures - Sliding Roof Hatch
  - 1. PS Doors Manufacturing Division: [www.pdoors.com](http://www.pdoors.com).
  - 2. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Roof Hatches: Factory-assembled steel frame and cover, complete with operating and release hardware.
  - 1. Style: Provide flat metal covers unless otherwise indicated.
  - 2. Mounting: Roof opening curb with extended rail system to accommodate sliding operation.
  - 3. Rail Supports: Standard with manufacturer.
  - 4. Size(s): As indicated on drawings; single-leaf style unless indicated as double-leaf.
- C. Frames/Curbs: One-piece curb and frame with integral cap flashing to receive roof flashings; extended bottom flange to suit mounting.
  - 1. Material: Galvanized steel, 0.06 inch thick.
  - 2. Finish: Shop primed and enamel finished; color as selected.
  - 3. Insulation: 2 inches rigid glass fiber, located on inside hollow curb.

- 4. Curb Height: 12 inches from surface of roof deck, minimum.
- D. Rails: Welded construction with 8 inch square roof pads; adjustable height.
- E. Metal Covers: Flush, insulated, hollow metal construction.
  - 1. Capable of supporting 30 psf live load.
  - 2. Material: Galvanized steel; outer cover 0.048 inch thick, liner 0.048 inch thick.
  - 3. Finish: Factory prime paint.
  - 4. Insulation: 2 inches rigid glass fiber.
  - 5. Gasket: Neoprene, continuous around cover perimeter.
- F. Weatherseals: Standard with manufacturer.
- G. Safety Railing System: Manufacturer's standard accessory safety rail system mounted directly to curb.
  - 1. Comply with OSHA 29 CFR 1910.23, with a safety factor of two.
- H. Hardware: Steel, zinc coated and chromate sealed, unless otherwise indicated or required by manufacturer.
  - 1. Latch: Upon closing, engage latch automatically and reset manual release.
  - 2. Locking: Padlock hasp on interior.

## **2.02 SNOW GUARDS**

- A. Snow Guards:
  - 1. Alpine Snow Guards: [www.alpinesnowguards.com](http://www.alpinesnowguards.com).
  - 2. Berger Building Products: [www.bergerbp.com](http://www.bergerbp.com).
  - 3. Metal Roof Innovations: [www.s-5.com](http://www.s-5.com).
  - 4. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Fence Type Snow Guard: Continuous snow guard; tubing set in brackets.
  - 1. Distance From Eaves: 8 inches.
  - 2. Bracket Spacing: 8 inches.
  - 3. Brackets: Aluminum on matching base plate.
  - 4. Tubing: Aluminum, mill finish.
    - a. Outside Diameter: 1 inch.
    - b. Wall Thickness: 1/8 inch.
    - c. Threaded Couplings: Aluminum, mill finish, 5 inches long.
    - d. End Collars and Caps: Metal to match.
- C. Clamps for Standing Seam Roof: Stainless steel clamps attached to standing seams of roof panels; for attachment of snow guard brackets.
  - 1. Seam Profile: Standard.
  - 2. Clamp Spacing: Every panel seam; maximum spacing of 24 inches.

## **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 instructions, in manner that maintains roofing weather integrity.

**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**



## FIRESTOPPING

### PART 1 GENERAL

#### 1.01 SECTION INCLUDES

- A. Firestopping systems.
- B. Firestopping of all joints and penetrations in fire-resistance rated and smoke-resistant assemblies, whether indicated on drawings or not, and other openings indicated.

#### 1.02 RELATED REQUIREMENTS

- A. Section 03 30 00 - Cast-In-Place Concrete: Concrete floors.
- B. Section 07 95 13 - Expansion Joint Cover Assemblies: Expansion joint covers at fire-rated walls.
- C. Section 09 21 16 - Gypsum Board Assemblies: Gypsum wallboard systems.

#### 1.03 REFERENCE STANDARDS

- A. ASTM E814 - Standard Test Method for Fire Tests of Penetration Firestop Systems; 2013a.
- B. ITS (DIR) - Directory of Listed Products; Intertek Testing Services NA, Inc.; current edition.
- C. FM 4991 - Approval of Firestop Contractors; Factory Mutual Research Corporation; 2001.
- D. FM P7825 - Approval Guide; Factory Mutual Research Corporation; current edition.
- E. SCAQMD 1168 - South Coast Air Quality Management District Rule No.1168; current edition; [www.aqmd.gov](http://www.aqmd.gov).
- F. UL (FRD) - Fire Resistance Directory; Underwriters Laboratories Inc.; current edition.

#### 1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Schedule of Firestopping: List each type of penetration, fire rating of the penetrated assembly, and firestopping test or design number.
- C. Product Data: Provide data on product characteristics, performance ratings, and limitations.
- D. Manufacturer's Installation Instructions: Indicate preparation and installation instructions.
- E. Qualification statements for installing mechanics.

#### 1.05 QUALITY ASSURANCE

- A. 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. Submission of actual test reports is required for assemblies for which none of the above substantiation exists.
- B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.
- C. Installer Qualifications: Company specializing in performing the work of this section and:
  - 1. Approved by Factory Mutual Research under FM Standard 4991, Approval of Firestop Contractors, or meeting any two of the following requirements:.
  - 2. With minimum 3 years documented experience installing work of this type.
  - 3. Able to show at least 5 satisfactorily completed projects of comparable size and type.
  - 4. Licensed by authority having jurisdiction.

5. Approved by firestopping manufacturer.

- D. Installing Mechanic's Qualifications: Trained by firestopping manufacturer and able to provide evidence thereof.

## **1.06 REGULATORY REQUIREMENTS**

- A. Conform to Oregon Structural Specialty Code for fire-resistance ratings, surface burning characteristics, F-Rating and T-Rating Requirements.
- B. Conform to Oregon Structural Specialty Code, Section 712, 712.3 and 712.4 for exceptions allowed by code.
- C. F-Rated Firestopping Systems: Provide system with F-Ratings indicated, as determined by ASTM E 814, but not less than fire resistive rating of construction penetrated.
- D. T-Rated Firestopping Systems: For following conditions, provide system with T-Ratings indicated, as well as F-Ratings, as determined by ASTM E814, where system protects items exposed to potential contact with adjacent materials in occupied spaces.
1. Penetration located outside wall cavities.
  2. Penetrations located outside fire-resistive shaft enclosures.
  3. Penetrations located in construction containing fire-protection-rated openings.
  4. Penetrating items larger than 4 inches (100 mm) in diameter nominal or 16 sq in (100 sq cm) in overall cross-sectional area.
- E. For joints in the following construction, provide fire-resistive joint systems that resist spread of fire, resist passage of smoke and other gases, and maintain original fire-resistive rating of assembly:
1. Fire-resistive non-load bearing walls and partitions.
- F. Fire Resistance of Joint Assembly: Assembly rating indicated for the construction assembly as determined by UL 2079 and UBC Standard 26-9.
- G. Systems and devices to withstand the passage of cold smoke either as an inherent property of the system or by the use of a separate product included as a part of the UL system or device and designed to perform this function. Systems complying with the requirements for through-penetration firestopping in fire-rated construction are acceptable provided the system will provide a smoke seal.
- H. Performance Requirements: Capable of withstanding standard fire and hose stream test (F-Rating) and limit temperature rise (T-Rating) of penetrations on protection side as required by code. Conform to UBC Standard 7-5.

## **1.07 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. Primers, Sleeves, Forms, Insulation, Packing, Stuffing, and Accessories: Type required for tested assembly design.
- B. Fire Ratings: See Drawings for required systems and ratings.

### **2.02 FIRESTOPPING SYSTEMS**

- A. Firestopping: Any material meeting requirements.

1. Fire Ratings: Use any system listed by UL or tested in accordance with ASTM E814 that has F Rating equal to fire rating of penetrated assembly and minimum T Rating Equal to F Rating and that meets all other specified requirements.

### **2.03 MATERIALS**

- A. Firestopping Sealants: Provide only products having lower volatile organic compound (VOC) content than required by South Coast Air Quality Management District Rule No.1168.
- B. Primers, Sleeves, Forms, Insulation, Packing, Stuffing, and Accessories: Type required for tested assembly design.

## **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.
- C. Install backing materials to arrest liquid material leakage.

### **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 installation with installation of expansion joint covers specified in Section 07 95 13.
- C. Do not cover installed firestopping until inspected by authority having jurisdiction.
- D. Install labeling required by code.

### **3.04 PROTECTION**

- A. Protect adjacent surfaces from damage by material installation.

**END OF SECTION**

## JOINT SEALERS

### PART 1 GENERAL

#### 1.01 SECTION INCLUDES

- A. Sealants and joint backing.
- B. Precompressed foam sealers.
- C. Preconstruction testing.

#### 1.02 RELATED REQUIREMENTS

- A. Section 07 25 00 - Weather Barriers: Sealants required in conjunction with air barriers and vapor retarders:
- B. Section 07 84 00 - Firestopping: Firestopping sealants.
- C. Section 08 80 00 - Glazing: Glazing sealants and accessories.
- D. Section 09 21 16 - Gypsum Board Assemblies: Acoustic sealant installation.
- E. Section 09 30 00 - Tiling: Sealant used as tile grout.

#### 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; 2014.
- 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 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data indicating sealant chemical characteristics.
- C. Manufacturer's Installation Instructions: Indicate special procedures.
- D. Preconstruction Field Test Reports: Indicate which sealants and joint preparation methods resulted in optimum adhesion to joint substrates based on preconstruction testing specified in Quality Assurance below.
- E. Compatibility and Adhesion Test Reports: From sealant manufacturer, including the following:
  1. Confirmation that joint substrates and joint-sealant backings have been tested for compatibility and adhesion with joint sealants.
  2. Interpretation of test results and written recommendations for primers and substrate preparation needed for adhesion.

#### 1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience.
- B. Applicator Qualifications: Company specializing in performing the work of this section with minimum three years documented experience and approved by manufacturer.
- C. Compatibility and Adhesion Testing: Submit to joint sealant manufacturers, for testing indicated below, samples of materials that will contact or affect joint sealants. Submit no fewer than four

pieces of each type of material, including joint substrates, shims, joint-sealant backings, secondary seals, and miscellaneous materials.

1. Use manufacturer's standard test method to determine whether priming and other specific joint preparation techniques are required to obtain rapid, optimum adhesion of joint sealants to joint substrate.
2. Schedule sufficient time for testing and analyzing results to prevent delaying Work.
3. For materials failing tests, obtain joint sealant manufacturer's written instruction for corrective measures including use of specially formulated primers.

#### **1.06 FIELD CONDITIONS**

- A. Maintain temperature and humidity recommended by the sealant manufacturer during and after installation.

#### **1.07 COORDINATION**

- A. Coordinate the work with all sections referencing this section.

#### **1.08 WARRANTY**

- A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.
- B. Provide a five year extended correction period for sealant work.
- C. Warranty: 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.

### **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. Type A - Elastomeric Sealant: ASTM C920; multi-component polyurethane, chemical curing, non-staining, non-bleeding, capable of continuous water immersion, non-sagging type; color as selected; meeting the following minimum requirements:
  1. Elongation: 25 percent
  2. Service Temperature Range:-40 to 180 degrees F.
  3. Shore A Hardness Range:+40
  4. Products:
    - a. DynaTred by Pecora Corporation: [www.pecora.com](http://www.pecora.com)
    - b. Vulkem 445SSL by Tremco: [www.tremcosealants.com](http://www.tremcosealants.com).
    - c. Substitutions: See Section 01 60 00 - Product Requirements.
- C. Type B - MS Polymer Sealant: ASTM C920, Type S, Grade NS, Class 100/50; single or 2-part component silyl-terminated polyether, moisture curing, non-staining, non-bleeding, capable of continuous water immersion, non-sagging type; multiple colors as selected to match adjacent materials; meeting the following minimum requirements.
  1. Elongation:100 percent
  2. Service Temperature Range:-40 to 220 degrees F
  3. Shore A Hardness Range: 15 to 20
  4. Products:
    - a. MasterSeal NP 150 (Sonolastic 150) by BASF: [www.basf.com](http://www.basf.com).
    - b. Substitutions: Section 01 60 00 - Product Requirements.
- D. Type C - Acoustical Sealant (Exposed): ASTM C834; single component latex, non-staining, non-bleeding, non-sagging type; multiple colors to match adjacent materials.
  1. Products:
    - a. AC20 FTR Acoustical and Insulation Sealant by Pecora Corporation: [www.pecora.com](http://www.pecora.com).
    - b. Sheetrock Acoustical Sealant by United States Gypsum Co: [www.usg.com](http://www.usg.com).
    - c. Substitutions: Section 01 60 00 - Product Requirements.

- E. Type D - Acoustical Sealant (Concealed): Single component latex, non-staining, non-bleeding, non-hardening, non-skinning, non-sagging type; synthetic rubber type.
  - 1. Products:
    - a. BA-98 by Pecora Corporation.
    - b. Tremco Acoustical Sealant by Tremco: [www.tremcosealants.com](http://www.tremcosealants.com).
    - c. Substitutions: Section 01 60 00 - Product Requirements.
- F. Type E - Silicone Sealant: Single component, mildew resistant, acid curing, silicone sealant; Class 25.
  - 1. Products:
    - a. 786 Mildew Resistant by Dow Corning Corporation: [www.dowcorningsealants.com](http://www.dowcorningsealants.com).
    - b. Sanitary SCS1700 by GE Silicones: [www.gesilicones.com](http://www.gesilicones.com).
    - c. Tremsil 200 by Tremco: [www.tremcosealants.com](http://www.tremcosealants.com).
    - d. Substitutions: Section 01 60 00 - Product Requirements.
- G. Type F - Sill Sealer: One component pre-formed foam gasket seal; width of sill plate; 0.19 inch thickness; perm rating of 0.3 or less.
  - 1. Products:
    - a. Greenguard Sill Sealer by Pactiv LLC: [www.trustgreenguard.com](http://www.trustgreenguard.com).
    - b. Foam SealR Sill Plate Gasket by Owens Corning: [www.owenscorning.com](http://www.owenscorning.com).
    - c. Substitutions: Section 01 60 00 - Product Requirements.
- H. Type G - Butyl Sealant: ASTM C1311; single component, solvent release, non-skinning, non-sagging.
  - 1. Color: Gray.
  - 2. Movement Capability: Plus and minus 12-1/2 percent.
  - 3. Service Temperature Range: -13 to 180 degrees F.
  - 4. Shore A Hardness Range: 10 to 30.
  - 5. Products:
    - a. Pecora BA-98 by Pecora Corporation: [www.pecora.com](http://www.pecora.com)
    - b. Tremco Butyl Sealant by Tremco: [www.tremcosealants.com](http://www.tremcosealants.com).
    - c. Substitutions: See Section 01 60 00 - Product Requirements.
- I. Type H - Epoxy Joint Filler; Two component, 100 percent solids content epoxy joint filler.
  - 1. Color: Gray to match concrete.
  - 2. Shore A Hardness Range: 90 to 95.
  - 3. Products:
    - a. MM-80 by Metzger/McGuire: [www.metzgermcguire.com](http://www.metzgermcguire.com).
    - b. 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: Round foam rod compatible with sealant; ASTM D 1667, closed cell PVC; oversized 30 to 50 percent larger than joint width.
- D. Bond Breaker: Pressure sensitive tape recommended by sealant manufacturer to suit application.

## PART 3 EXECUTION

### 3.01 EXAMINATION

- A. Verify that substrate surfaces are ready to receive work.
- B. Verify that joint backing and release tapes are compatible with sealant.
- C. Verify that preconstruction testing has been completed.

**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.

**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. Measure joint dimensions and size joint backers to achieve the following, unless otherwise indicated:
  - 1. Width/depth ratio of 2:1.
  - 2. Neck dimension no greater than 1/3 of the joint width.
  - 3. Surface bond area on each side not less than 75 percent of joint width.
- E. Install bond breaker where joint backing is not used.
- F. Install sealant free of air pockets, foreign embedded matter, ridges, and sags.
- G. Apply sealant within recommended application temperature ranges. Consult manufacturer when sealant cannot be applied within these temperature ranges.
- H. Tool joints concave.
- I. Precompressed Foam Sealant: Do not stretch; avoid joints except at corners, ends, and intersections; install with face 1/8 to 1/4 inch below adjoining surface.

**3.04 CLEANING**

- A. Clean adjacent soiled surfaces.

**3.05 PROTECTION**

- A. Protect sealants until cured.

**3.06 SCHEDULE**

- A. Type A - Elastomeric:
  - 1. Interior concrete slab joints.
  - 2. Exterior concrete paving joints.
- B. Type B - MS Polymer:
  - 1. Sheet metal work.
  - 2. Exterior and interior perimeter of metal door and window frames.
  - 3. Perimeter of window frames.
  - 4. Perimeter of storefront and curtain wall systems.
  - 5. Other joints indicated on Drawings.
- C. Type C - Acoustical Sealant (Interior):
  - 1. Perimeter of gypsum board in acoustical wall, and corner intersections.
  - 2. Perimeter of penetrations in acoustical walls and ceilings.
  - 3. Perimeter of suspended acoustical ceiling wall angles.
- D. Type D: Acoustical Sealant (Interior):
  - 1. Under stud track at acoustical walls, 2 beads continuous.

2. Concealed perimeter of gypsum board in acoustical walls and corner intersections.
  3. Concealed perimeter of penetrations in acoustical walls.
- E. Type E - Silicone Sealant:
1. Perimeter of plumbing fixtures.
  2. Joints in ceramic tile.
- F. Type F - Sill Sealer Gasket:
1. Under exterior framed wall sill plates.
- G. Type G - Butyl Sealant:
1. Bedding of exterior thresholds.
- H. Type H - Epoxy Filler:
1. Interior joints in polished concrete.

**END OF SECTION**



## EXPANSION JOINT COVER ASSEMBLIES

### PART 1 GENERAL

#### 1.01 SECTION INCLUDES

- A. Expansion joint assemblies for roofs, ceiling, soffit, and floors.

#### 1.02 RELATED REQUIREMENTS

- A. Section 07 54 00 - Thermoplastic Membrane Roofing: Roof expansion joints.
- B. Section 07 62 00 - Sheet Metal Flashing and Trim: Roof control joints at metal roofing; flashing base for exterior wall joints.
- C. Section 07 84 00 - Firestopping.

#### 1.03 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide joint assembly profiles, profile dimensions, anchorage devices, available colors and finish .
- C. Shop Drawings: Indicate joint and splice locations, miters, layout of the work, affected adjacent construction, anchorage locations .
- D. Manufacturer's Installation Instructions: Indicate rough-in sizes; provide templates for cast-in or placed frames or anchors; required tolerances for item placement.

#### 1.04 MOCK-UP

- A. Provide a mock-up of the seismic joint at the parapet and roof condition for evaluation of fabrication workmanship.
- B. Locate where directed.
- C. Mock-up may remain as part of the Work.

### PART 2 PRODUCTS

#### 2.01 EXPANSION JOINT COVER ASSEMBLIES

- A. Expansion Joint Cover Assemblies - General: Factory-fabricated and assembled; designed to completely fill joint openings, sealed to prevent passage of air, dust, water, smoke; suitable for traffic expected.
  1. Joint Dimensions and Configurations: As indicated on drawings.
  2. Joint Cover Sizes: Selected to suit joint width and configuration, based on manufacturer's published recommendations and limitations.
  3. Lengths: Provide covers in full lengths required; avoid splicing wherever possible.
  4. Anchors, Fasteners, and Fittings: Provided by cover manufacturer.

#### 2.02 VERTICAL WALL JOINTS

- A. Description: Exterior wall to wall connection; extruded aluminum frame, snap-in thermoplastic primary and secondary seals; color as selected; 3 inch joint size, 50 percent movement.
- B. Products:
  1. Model SF-300 by Construction Specialties, Inc: [www.c-sgroup.com](http://www.c-sgroup.com).
  2. Substitutions: See Section 01 60 00 - Product Requirements.

#### 2.03 CEILING JOINTS

- A. Description: Interior ceiling to wall connection; extruded aluminum frame suitable for anchoring to ceiling suspension system and wall, thermoplastic seal, color as selected; 2 inch expansion joint size.

- B. Product:
  - 1. Model HC by Construction Specialties, Inc: [www.c-sgroup.com](http://www.c-sgroup.com).
  - 2. Substitutions: See Section 01 60 00 - Product Requirements.

**PART 3 EXECUTION**

**3.01 EXAMINATION**

- A. Verify that joint preparation and dimensions are acceptable and in accordance with manufacturer's requirements.

**3.02 INSTALLATION**

- A. Install components and accessories in accordance with manufacturer's instructions.
- B. Coordinate joint installation at fire-rated walls with installation of firestopping specified in Section 07 84 00.
- C. Align work plumb and level, flush with adjacent surfaces.
- D. Rigidly anchor to substrate to prevent misalignment.

**END OF SECTION**

## HOLLOW METAL DOORS AND FRAMES

### PART 1 GENERAL

#### 1.01 SECTION INCLUDES

- A. Non-fire-rated steel doors and frames.
- B. Steel frames for wood doors.
- C. Fire-rated steel doors and frames.
- D. Thermally insulated steel doors.

#### 1.02 RELATED REQUIREMENTS

- A. Section 08 14 16 - Flush Wood Doors.
- B. Section 08 71 00 - Door Hardware.
- C. Section 08 80 00 - Glazing: Glass for doors and borrowed lites.
- D. Section 09 90 00 - Painting and Coating: Field painting.

#### 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 (R2008).
- C. ANSI A250.10 - Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames; 1998 (R2011).
- D. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2013.
- E. ASTM C518 - Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus; 2010.
- F. ASTM C1363 - Standard Test Method for Thermal Performance of Building Assemblies by Means of a Hot Box Apparatus; 2011.
- G. BHMA A156.115 - Hardware Preparation in Steel Doors and Steel Frames; 2006.
- H. NAAMM HMMA 840 - Guide Specifications for Installation and Storage of Hollow Metal Doors and Frames; The National Association of Architectural Metal Manufacturers; 2007.
- I. NFPA 80 - Standard for Fire Doors and Other Opening Protectives; 2013.
- J. UL (BMD) - Building Materials Directory; Underwriters Laboratories Inc.; current edition.
- K. UL 10C - Standard for Positive Pressure Fire Tests of Door Assemblies; Current Edition, Including All Revisions.
- L. UL 1784 - Standard for Air Leakage Tests of Door Assemblies; Current Edition, Including All Revisions.

#### 1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Materials and details of design and construction, hardware locations, reinforcement type and locations, anchorage and fastening methods, and finishes.
- C. Shop Drawings: Details of each opening, showing elevations, glazing, frame profiles, and identifying location of different finishes, if any.

- D. Installation Instructions: Manufacturer's published instructions, including any special installation instructions relating to this project.

**1.05 QUALITY ASSURANCE**

- A. Maintain at the project site a copy of all reference standards dealing with installation.

**1.06 DELIVERY, STORAGE, AND HANDLING**

- A. Store in accordance with NAAMM HMMA 840.
- B. Protect with resilient packaging; avoid humidity build-up under coverings; prevent corrosion.

**PART 2 PRODUCTS**

**2.01 MANUFACTURERS**

- A. Steel Doors and Frames:
  1. Assa Abloy Ceco, Curries, or Fleming: [www.assaabloydss.com](http://www.assaabloydss.com).
  2. Republic Doors: [www.republicdoor.com](http://www.republicdoor.com).
  3. Steelcraft, an Allegion brand: [www.allegion.com/us](http://www.allegion.com/us).
  4. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Sound-Rated Steel Doors:
  1. Black Mountain Door, LLC, Amweld Soundshield Doors: [www.blackmountaindoor.com](http://www.blackmountaindoor.com).
  2. Substitutions: See Section 01 60 00 - Product Requirements.

**2.02 DOORS AND FRAMES**

- A. Requirements for All Doors and Frames:
  1. ADA Compliant: Comply with ANSI/ICC A117.1 and Oregon Structural Specialty Code.
  2. Door Top Closures: Flush with top of faces and edges.
  3. Door Edge Profile: Beveled on both edges.
  4. Door Texture: Smooth faces.
  5. Glazed Lights: Non-removable stops on non-secure side; sizes and configurations as indicated on drawings.
  6. Hardware Preparation: In accordance with BHMA A156.115, with reinforcement welded in place, in addition to other requirements specified in door grade standard.
  7. Galvanizing for Units in Wet Areas: Components hot-dipped zinc-iron alloy-coated (galvannealed) in accordance with ASTM A653/A653M, with A60/ZF180 coating thickness
  8. Finish: Factory primed, for field finishing.
- B. Combined Requirements: If a particular door and frame unit is indicated to comply with more than one type of requirement, comply with all the specified requirements for each type; for instance, an exterior door that is also indicated as being sound-rated must comply with the requirements specified for exterior doors and for sound-rated doors; where two requirements conflict, comply with the most stringent.

**2.03 STEEL DOORS**

- A. Exterior Doors:
  1. Grade: ANSI A250.8 - SDI-100; Level 3 - Extra Heavy-Duty, Physical Performance Level A, Model 2 - Seamless.
  2. Core: Polyurethane.
  3. Thickness: 1-3/4 inch.
  4. Galvanizing: Components hot-dipped zinc-iron alloy-coated (galvannealed) in accordance with ASTM A653/A653M, with manufacturer's standard coating thickness.
  5. Insulating Value: U-value of 0.31, when tested in accordance with ASTM C1363.
  6. Insulating Value: U-value of 0.09, when tested in accordance with ASTM C518.
  7. Weatherstripping: Separate, see Section 08 71 00.
- B. Interior Doors, Non-Fire-Rated:

1. Grade: ANSI A250.8 - SDI-100; Level 3 - Extra Heavy-Duty, Physical Performance Level A, Model 2 - Seamless.
  2. Core: Kraftpaper honeycomb.
  3. Thickness: 1-3/4 inch.
- C. Interior Doors, Fire-Rated:
1. Grade: ANSI A250.8 - SDI-100; Level 3 - Extra Heavy-Duty, Physical Performance Level A, Model 2 - Seamless.
  2. Fire Rating: As indicated on Door and Frame Schedule, tested in accordance with UL 10C ("positive pressure").
    - a. Rate of Temperature Rise Across Door Thickness : 250 degrees F.
    - b. Provide units listed and labeled by UL (Underwriters Laboratories) - UL (BMD).
    - c. Attach fire rating label to each fire rated unit.
  3. Core: Mineral board.
  4. Thickness: 1-3/4 inch.
- D. Interior Smoke and Draft Control Doors : Same fire rated construction as the fire-rated doors, and the following;
1. Maximum Air Leakage: 3.0 cfm/sq ft of door opening at 0.10 inch w.g. pressure, when tested in accordance with UL 1784 at both ambient and elevated temperatures.
  2. Gasketing: No added gasketing or seals allowed.
  3. Label: UL "S" label.

## 2.04 STEEL FRAMES

- A. General:
1. Comply with the requirements of grade specified for corresponding door.
    - a. Frames for Wood Doors: Comply with frame requirements specified in ANSI A250.8 for Level 1, 16 gage.
    - b. Frames for Exterior Doors: Comply with frame requirements specified in ANSI A250.8 for Level 3 Doors, 14 gage.
  2. Finish: Factory primed, for field finishing.
  3. Provide mortar guard boxes for hardware cut-outs in frames to be installed in masonry or to be grouted.
  4. Frames in Masonry Walls: Size to suit masonry coursing with head member 4 inches high to fill opening without cutting masonry units.
  5. Frames Wider than 48 Inches: Reinforce with steel channel fitted tightly into frame head, flush with top.
- B. Exterior Door Frames: Face welded, seamless with joints filled.
1. Galvanizing: Components hot-dipped zinc-iron alloy-coated (galvannealed) in accordance with ASTM A653/A653M, with manufacturer's standard coating thickness.
  2. Thermal Break: True thermally-broken frame profile.
  3. Weatherstripping: Separate, see Section 08 71 00.
- C. Interior Door Frames, Non-Fire-Rated: Fully welded type.
- D. Interior Door Frames, Fire-Rated: Fully welded type.
1. Fire Rating: Same as door, labeled.
- E. Frame Profiles: As follows or as indicated on Drawings.
1. Exterior Doors: 2 inch face frame width.
  2. Interior Doors: 2 inch face frame width.

## 2.05 ACCESSORY MATERIALS

- A. Glazing: As specified in Section 08 80 00 .
- B. Removable Stops: Formed sheet steel, shape as indicated on drawings, mitered or butted corners; prepared for countersink style tamper proof screws.
- C. Astragals for Double Doors:

1. Exterior Doors: Steel, Z-shaped.
  2. Fire-Rated Doors: Steel, shape as required to accomplish fire rating.
- D. 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. Do not install silencers on door to receive gasket seals.
- E. Temporary Frame Spreaders: Provide for all factory- or shop-assembled frames.
- F. Jamb Anchors: Provide welded floor anchor at each jamb.

## **2.06 FINISH MATERIALS**

- A. Primer: Rust-inhibiting, complying with ANSI A250.10, baked on.
- B. Bituminous Coating: Asphalt emulsion or other high-build, water-resistant, resilient coating.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify existing conditions before starting work.
- B. Verify that opening sizes and tolerances are acceptable.

### **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. In addition, install fire rated units in accordance with NFPA 80.
- C. Coordinate frame anchor placement with wall construction.
- D. Coordinate installation of hardware.
- E. Coordinate installation of glazing.
- F. Coordinate installation of electrical connections to electrical hardware items.

### **3.04 TOLERANCES**

- A. Clearances Between Door and Frame: As specified in ANSI A250.8 - SDI-100.
- 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.

**END OF SECTION**

**FLUSH WOOD DOORS****PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Flush wood doors; flush and flush glazed configuration; fire rated, non-rated, and acoustical.
- B. Sound retardant door and frame assemblies (wood door, frame, and related hardware).

**1.02 RELATED REQUIREMENTS**

- A. Section 08 11 13 - Hollow Metal Doors and Frames.
- B. Section 08 71 00 - Door Hardware.
- C. Section 08 80 00 - Glazing.

**1.03 REFERENCE STANDARDS**

- A. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards; 2009.
- B. AWI/AWMAC (QSI) - Architectural Woodwork Quality Standards Illustrated; Architectural Woodwork Institute and Architectural Woodwork Manufacturers Association of Canada; 2006, 8th Ed., Version 2.0.
- C. ITS (DIR) - Directory of Listed Products; Intertek Testing Services NA, Inc.; current edition.
- D. NFPA 80 - Standard for Fire Doors and Other Opening Protectives; 2013.
- E. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies; National Fire Protection Association; 2012.
- F. UL (BMD) - Building Materials Directory; Underwriters Laboratories Inc.; current edition.
- G. UL 10B - Standard for Fire Tests of Door Assemblies; Current Edition, Including All Revisions.
- H. UL 1784 - Standard for Air Leakage Tests of Door Assemblies; Current Edition, Including All Revisions.

**1.04 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Indicate door core materials and construction; veneer species, type and characteristics.
- C. Specimen warranty.
- D. Shop Drawings: Illustrate door opening criteria, elevations, sizes, types, swings, undercuts required, special beveling, special blocking for hardware, factory machining criteria, factory finishing criteria, identify cutouts for glazing and louvers.
- E. Samples: Submit two samples of door veneer, 8 x 10 inch in size illustrating wood grain, stain color, and sheen.
- F. Manufacturer's Installation Instructions: Indicate special installation instructions.
- G. Warranty, executed in Owner's name.

**1.05 QUALITY ASSURANCE**

- A. Maintain one copy of the specified door quality standard on site for review during installation and finishing.
- B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years of documented experience.

- C. Installed Fire Rated Door Assembly: Conform to NFPA 80 for fire rated class as indicated.

**1.06 DELIVERY, STORAGE, AND HANDLING**

- A. Package, deliver and store doors in accordance with specified quality standard.
- B. Accept doors on site in manufacturer's packaging. Inspect for damage.
- C. Protect doors with resilient packaging sealed with heat shrunk plastic. Do not store in damp or wet areas; or in areas where sunlight might bleach veneer. Seal top and bottom edges with tinted sealer if stored more than one week. Break seal on site to permit ventilation.

**1.07 PROJECT CONDITIONS**

- A. Coordinate the work with door opening construction, door frame and door hardware installation.

**1.08 WARRANTY**

- A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.
- B. Interior Doors: Provide manufacturer's warranty for the life of the installation.
- C. Provide warranty for the following term:
  - 1. Interior Doors: Life of installation.
- D. Include coverage for delamination of veneer, warping beyond specified installation tolerances, defective materials, and telegraphing core construction.

**PART 2 PRODUCTS**

**2.01 MANUFACTURERS**

- A. Wood Veneer Faced Doors:
  - 1. Algoma Hardwoods, Inc: [www.algomahardwoods.com](http://www.algomahardwoods.com).
  - 2. Eggers Industries: [www.eggertindustries.com](http://www.eggertindustries.com).
  - 3. Marshfield DoorSystems, Inc: [www.marshfielddoors.com](http://www.marshfielddoors.com).
  - 4. Overly Door Company: [www.overly.com](http://www.overly.com).
  - 5. Vancouver Door, Inc: [www.vancouverdoorco.com](http://www.vancouverdoorco.com).
  - 6. Western Door Systems, Inc: [www.westerndoor.com](http://www.westerndoor.com).
  - 7. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Sound Retardant Door and Frame Assemblies:
  - 1. Overly Door Company: [www.overly.com](http://www.overly.com).
  - 2. Marshfield DoorSystems, Inc: [www.marshfielddoors.com](http://www.marshfielddoors.com).
  - 3. Substitutions: See Section 01 60 00 - Product Requirements.

**2.02 DOORS**

- A. All Doors: See drawings for locations and additional requirements.
  - 1. Quality Level: Premium Grade, Heavy Duty performance, in accordance with AWI/AWMAC/WI (AWS).
  - 2. Wood Veneer Faced Doors: 5-ply unless otherwise indicated.
- B. Interior Doors: 1-3/4 inches thick unless otherwise indicated; flush construction.
  - 1. Provide solid core doors at all locations.
  - 2. Fire Rated Doors: Tested to ratings indicated on drawings in accordance with International Building Code (IBC) - Positive Pressure; Underwriters Laboratories Inc. (UL) or Intertek/Warnock Hersey (WHI) labeled without any visible seals when door is open.
  - 3. Smoke and Draft Control Doors : In addition to required fire rating, provide door assemblies tested 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 for "S" label; if necessary, provide additional gasketing or edge sealing.



**2.03 DOOR AND PANEL CORES**

- A. Non-Rated Solid Core and 20 Minute Rated Doors: Type structural composite lumber core (SCLC), plies and faces as indicated.
- B. Fire Rated Doors: Mineral core type, with fire resistant composite core (FD), plies and faces as indicated above; with core blocking as required to provide adequate anchorage of hardware without through-bolting.

**2.04 DOOR FACINGS**

- A. Veneer Facing for Transparent Finish: Vertical grain (VG) Douglas fir, veneer grade in accordance with quality standard indicated, plain sliced (flat cut), with book match between leaves of veneer, running match of spliced veneer leaves assembled on door or panel face.
  - 1. Vertical Edges: Same species as face veneer.
  - 2. "Pair Match" each pair of doors; "Set Match" pairs of doors within 10 feet of each other when doors are closed.

**2.05 SOUND RETARDANT DOOR AND FRAME ASSEMBLIES**

- A. Description: Sound retardant door and frame assembly consisting of wood door, frame and related hardware.
  - 1. Minimum STC of 45, calculated in accordance with ASTM E413, tested in accordance with ASTM E90.
- B. Door: See drawings for locations and additional requirements.
  - 1. Quality Level: Premium Grade, Heavy Duty performance, in accordance with AWI/AWMAC/WI (AWS).
  - 2. Wood Veneer Faced Doors: 5-ply unless otherwise indicated.
  - 3. Thickness: 1-3/4 inches.
  - 4. Core: Solid core as required to achieve STC rating specified; plies and faces as indicated.
  - 5. Veneer Facing: Vertical grain Douglas fir, veneer grade in accordance with quality standard indicated, plain sliced (flat cut), with book match between leaves of veneer, running match of spliced veneer leaves assembled on door or panel face.
- C. Frame: Formed steel, 14 gage, fully welded, with profile similar to frames specified in Section 08 11 13.
- D. Relite: Acoustical glass; 3/8 inch thick and frame assembly; size as indicated on Drawings.
- E. Hardware:
  - 1. Hinges: Cam lift type.
  - 2. Seals: Perimeter at jamb and head to achieve specified STC performance.
  - 3. Door Bottom: Automatic mortise type.
  - 4. Lockset: As specified in Section 08 71 00 - Door Hardware.

**2.06 ACCESSORIES**

- A. Metal Louvers:
  - 1. Material and Finish: Roll formed steel; primed for field painting.
  - 2. Louver Blade: Inverted Y blade, sight proof, light proof, security grille.
  - 3. Louver Free Area: 50 percent.
  - 4. Frame: Square style with surface fasteners.
  - 5. Products:
    - a. Model PLSL by Anemostat Door Products: [www.anemostat.com](http://www.anemostat.com).
    - b. Model 1500-A by Air Louver Inc.: [www.airlouvers.com](http://www.airlouvers.com).
    - c. Substitutions: Section 01 60 00 - Product Requirements.
- B. Glazing: Safety glass as specified in Section 08 80 00.
- C. Glazing Stops: Wood with metal clips for rated doors, mitered corners; prepared for countersink style tamper proof screws.

**2.07 DOOR CONSTRUCTION**

- A. Fabricate doors in accordance with door quality standard specified.
- B. Cores Constructed with stiles and rails:
- C. Fit door edge trim to edge of stiles after applying veneer facing.
- D. Factory machine doors for hardware other than surface-mounted hardware, in accordance with hardware requirements and dimensions.
- E. Factory fit doors for frame opening dimensions identified on shop drawings, with edge clearances in accordance with specified quality standard.
- F. Provide edge clearances in accordance with the quality standard specified.

**2.08 FACTORY FINISHING - WOOD VENEER DOORS**

- A. Finish work in accordance with AWI/AWMAC/WI (AWS), Section 5 - Finishing for Grade specified and as follows:
  - 1. Transparent:
    - a. System - 5, Varnish, Conversion.
    - b. Sheen: Flat.
- B. Seal door top edge with color sealer to match door facing.

**PART 3 EXECUTION****3.01 EXAMINATION**

- A. Verify existing conditions before starting work.
- B. Verify that opening sizes and tolerances are acceptable.
- C. Do not install doors in frame openings that are not plumb or are out-of-tolerance for size or alignment.

**3.02 INSTALLATION**

- A. Install doors in accordance with manufacturer's instructions and specified quality standard.
  - 1. Install fire-rated doors in accordance with NFPA 80 requirements.
- B. Factory-Finished Doors: Do not field cut or trim; if fit or clearance is not correct, replace door.
- C. Use machine tools to cut or drill for hardware.
- D. Coordinate installation of doors with installation of frames and hardware.
- E. Install glazing stops in accordance with manufacturer's recommendations; coordinate installation of glazing specified in Section 08 80 00.

**3.03 TOLERANCES**

- A. Conform to specified quality standard for fit and clearance tolerances.
- B. Conform to specified quality standard for telegraphing, warp, and squareness.
- C. Maximum Vertical Distortion (Bow): 1/8 inch measured with straight edge or taut string, top to bottom, over an imaginary 36 by 84 inches surface area.
- D. Maximum Width Distortion (Cup): 1/8 inch measured with straight edge or taut string, edge to edge, over an imaginary 36 by 84 inches surface area.

**3.04 ADJUSTING**

- A. Adjust doors for smooth and balanced door movement.

B. Adjust closers for full closure.

**END OF SECTION**

**ACCESS DOORS AND PANELS****PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Floor access door and frame units, interior.
- B. Access door and frame units, non-fire-rated, in wall and ceiling locations.

**1.02 RELATED REQUIREMENTS**

- A. Section 04 27 31 - Reinforced Unit Masonry: Openings in masonry.
- B. Section 09 21 16 - Gypsum Board Assemblies: Openings in partitions and ceilings.
- C. Section 09 22 26 - Suspension Systems: Openings in suspended gypsum ceilings.
- D. Section 09 90 00 - Painting and Coating: Field paint finish.

**1.03 REFERENCE STANDARDS**

- A. ITS (DIR) - Directory of Listed Products; Intertek Testing Services NA, Inc.; current edition.
- B. UL (FRD) - 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 sizes, types, finishes, hardware, scheduled locations, and details of adjoining work.
- C. Shop Drawings: Indicate exact position of all access door units.
- D. Manufacturer's Installation Instructions: Indicate installation requirements.

**1.05 REGULATORY REQUIREMENTS**

- A. Conform to applicable code for fire rated access doors.
  - 1. Provide access doors of fire rating equivalent to the fire rated assembly in which they are to be installed.
- B. Provide products listed and labeled by UL or ITS (Warnock Hersey) as suitable for the purpose specified and indicated.

**1.06 PROJECT CONDITIONS**

- A. Coordinate the work with other work requiring access doors.

**PART 2 PRODUCTS****2.01 ACCESS DOORS AND PANELS**

- A. All Units: Factory fabricated, 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.

**2.02 ACCESS DOOR / PANEL UNITS - WALLS AND CEILINGS**

- A. Type AP-1: Door and Frame Units: Formed steel.
  - 1. Frames and flanges: 0.058 inch steel; profile compatible with wall construction.
  - 2. Door panels: 0.070 inch single thickness steel sheet; double sheet with integral non-combustible insulation filler as rated doors.
  - 3. Fire-Rating: Non-rated.
  - 4. Size: As indicated on Drawings.
  - 5. Hardware:

- a. Hinges for Non-Fire-Rated Units: Concealed, constant force closure spring type.
- b. Hinge: 175 degree stainless steel piano hinge with removable pin.
- c. Lock: Cylinder lock with latch, two keys for each unit.
- 6. Galvanized, hot dipped finish.
- 7. Prime coat with alkyd primer.
- 8. Manufacturers:
  - a. Karp Associates, Inc: [www.karpinc.com](http://www.karpinc.com).
  - b. Milcor Inc: [www.milcorinc.com](http://www.milcorinc.com).
  - c. Bilco Company: [www.bilco.com](http://www.bilco.com).
  - d. Substitutions: See Section 01 60 00 - Product Requirements.

### **2.03 FLOOR UNITS**

- A. Type AP-2: Floor Door and Frame Units: Steel; factory fabricated, 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. Size: As indicated.
  - 2. Design Load: Design to support live load of 150 lb/sq ft with deflection not to exceed 1/180 of span.
  - 3. Operation: Manual opening, manual closing.
  - 4. Cover Pattern: Diamond tread plate.
  - 5. Finish: Rust inhibiting primer.
  - 6. Hardware: Steel, hot-dipped galvanized.
    - a. Hinges: Removable pin.
  - 7. Manufacturers:
    - a. Karp Associates, Inc: [www.karpinc.com](http://www.karpinc.com).
    - b. Milcor Inc: [www.milcorinc.com](http://www.milcorinc.com).
    - c. Bilco Company: [www.bilco.com](http://www.bilco.com).
    - d. Substitutions: See Section 01 60 00 - Product Requirements.

### **2.04 FABRICATION**

- A. Weld, fill, and grind joints to ensure flush and square unit.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify that rough openings are correctly sized and located.

### **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.

**END OF SECTION**

**SLIDING/FOLDING GLAZED DOORS/WALLS****PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Factory fabricated sliding/folding glazed door/wall with frames and operating hardware.
  1. Aluminum panel frame system.

**1.02 RELATED REQUIREMENTS**

- A. Section 07 90 05 - Joint Sealers: Perimeter sealant and backup materials.
- B. Section 08 71 00 - Door Hardware: Cylinder locks.

**1.03 REFERENCE STANDARDS**

- A. AAMA 611 - Voluntary Specification for Anodized Architectural Aluminum; 2012.
- B. ASTM D1187/D1187M - Standard Specification for Asphalt-Base Emulsions for Use as Protective Coatings for Metal; 1997 (Reapproved 2011).

**1.04 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide information on dimensions, frame and sill construction, glazing, and hardware.
- C. Shop Drawings: Indicate opening dimensions, elevations of different types, and framed opening tolerances.
- D. Manufacturer's Installation Instructions: Include complete preparation, installation, and cleaning requirements.

**1.05 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company specializing in, and with not fewer than three years of experience, manufacturing products of the type specified.
- B. Installer Qualifications: Company specializing in installation of products of the type specified, with not fewer than three 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 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. Correct defective Work within a five year period after Date of Substantial Completion.

**PART 2 PRODUCTS****2.01 MANUFACTURERS**

- A. Aluminum Sliding/Folding Glazed Doors/Walls:
  1. NanaWall Systems, Inc; SL45 Aluminum Framed Folding Panel System: [www.nanawall.com](http://www.nanawall.com).
  2. Substitutions: See Section 01 60 00 - Product Requirements.

**2.02 SLIDING/FOLDING GLAZED DOORS/WALLS**

- A. Aluminum Sliding/Folding Glazed Doors/Walls: Extruded aluminum sliding/folding and operable panel frames, factory fabricated; complete with sill, flashings, support and anchorage devices, and glazing.
  - 1. Configuration: Inward opening, bi-parting, right and left stacking.
  - 2. Support System: Top hung.
  - 3. Standard Sill: Flush type, with sealant, shims and fasteners at necessary locations.
  - 4. Aluminum Frames: Factory finished; manufacturer's standard corner construction.
  - 5. Drainage: Provide drainage to exterior for moisture entering joints and glazing spaces and for condensation occurring within frame construction.
  - 6. Glass Stops: Same material and color as frame.
  - 7. Aluminum Frame Finish: Anodized coating in accordance with AAMA 611.
    - a. Exterior Color: Clear anodized
    - b. Interior Color: Clear anodized
- B. Construction: Factory assemble sliding/folding operable panel frames as single unit, including head, jambs, and bottom sections; provide concealed fasteners.
  - 1. Sizes: Allow for tolerances of rough framed openings, clearances, and shims at perimeter of assemblies.
  - 2. Joints and Corners: Flush, hairline and waterproof, accurately fitted and secured; prepared to receive anchors; fasteners and attachments concealed from view; reinforced as required for imposed loads.
  - 3. Glazing: Factory installed.

**2.03 COMPONENTS**

- A. Glazing: As specified in Section 08 80 00.
- B. Sliding/Folding Hardware: Provide manufacturer's standard hardware including carriages with sealed ball bearing rollers, and top or bottom tracks.
- C. Weatherstripping: Brush seals, continuous and replaceable; provide between exterior doors, panels, frame and track.
- D. Exposed Hardware Finish: Manufacturer's standard.
- E. Hinges: Die-cast zinc.
- F. Locking Mechanisms: Minimum 2-point deadbolt locking of each panel; manufacturer's standard type.
- G. Swing Door Locking: Lever handle lockset with deadbolt into jamb strike; manufacturer's standard type.
- H. Cylinder Locks: As specified in Section 08 71 00.
- I. Anchors: Hot-dipped galvanized or stainless steel in accordance with project and manufacturer's installation requirements.
- J. Sealant and Backing Materials: As specified in Section 07 90 05.
- K. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D1187/D1187M, Type I.

**PART 3 EXECUTION****3.01 EXAMINATION**

- A. Verify that openings are ready to receive work and opening dimensions and clearances are as indicated on approved shop drawings.
- B. Verify that overhead structural supports are adequate and deflection is in compliance with manufacturer's installation requirements.

**3.02 INSTALLATION**

- A. Install door/wall unit assembly in accordance with manufacturer's instructions.
- B. Attach frame and shims to perimeter opening to accommodate construction tolerances and other irregularities.
- C. Use anchorage devices to securely fasten assembly to adjacent construction without distortion or imposed stresses.
- D. Install perimeter trim.

**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.

**3.04 ADJUSTING**

- A. Adjust hardware for smooth operation.

**3.05 CLEANING**

- A. Remove protective material from factory finished surfaces.
- B. Remove labels and visible markings.
- C. Wash surfaces by method recommended and acceptable to sealant and window manufacturer; rinse and wipe surfaces clean.

**3.06 PROTECTION**

- A. Protect installed products from damage during subsequent construction activities.

**END OF SECTION**



## COILING COUNTER DOORS

### PART 1 GENERAL

#### 1.01 SECTION INCLUDES

- A. Non-fire-rated coiling counter doors and operating hardware.
- B. Electric motor operation; wiring from electric circuit disconnect to operator to control station.

#### 1.02 RELATED REQUIREMENTS

- A. Section 04 22 00 - Concrete Unit Masonry: Openings.
- B. Section 09 21 16 - Gypsum Board Assemblies: Openings.
- C. Section 06 05 00 - Common Work Results for Electrical: Electrical connections.

#### 1.03 REFERENCE STANDARDS

- A. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2010.
- B. NEMA MG 1 - Motors and Generators; National Electrical Manufacturers Association; 2011.
- C. UL (EAUED) - Electrical Appliance and Utilization Equipment Directory; Underwriters Laboratories Inc.; current edition.

#### 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.
- C. Shop Drawings: Indicate rough and actual opening dimensions, anchorage methods, hardware locations, and installation details.
- D. Samples: Submit two slats, 4 inches 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.

### PART 2 PRODUCTS

#### 2.01 MANUFACTURERS

- A. Basis of Design: Series 650 by Overhead Door Corporation: [www.overheaddoor.com](http://www.overheaddoor.com).
- B. Other Approved Manufacturers:
  1. Cornell Iron Works, Inc: [www.cornelliron.com](http://www.cornelliron.com).
  2. The Cookson Company: [www.cooksondoor.com](http://www.cooksondoor.com).
  3. Wayne-Dalton Corporation: [www.waynedalton.com](http://www.waynedalton.com).
  4. Substitutions: See Section 01 60 00 - Product Requirements.

#### 2.02 COILING COUNTER DOORS

- A. Coiling Counter Doors, Non-Fire-Rated: Stainless steel slat curtain.
  1. Mounting: Interior face mounted.
  2. Nominal Slat Size: 1-1/4 inches wide.
  3. Slat Profile: Flat.

4. Finish: No. 4.
5. Guides: Formed track; same material and finish unless otherwise indicated.
6. Hood: Manufacturer's standard; .
7. Operation: Electric motor.

**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. Stainless Steel Slats: ASTM A666, Type 304; minimum thickness 22 gage, 0.03 inch.
  4. Weatherstripping: Moisture and rot proof, resilient type, located at jamb edges, bottom of curtain, and where curtain enters hood enclosure of all doors.
- B. Guide Construction: Continuous, of profile to retain door in place, with mounting brackets of same metal.
  1. Stainless Steel Guides: ASTM A666, Type 304, rollable temper.
- C. Hood Enclosure: Internally reinforced to maintain rigidity and shape; stainless steel.
- D. Latching: Inside mounted, sliding deadbolt.
- E. 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. Electrically Operated Doors: Listed and classified by Underwriters Laboratories Inc. as suitable for the purpose specified and indicated.
- 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) momentary control for each operator.
  1. 24 volt circuit.
  2. Recessed.
- 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 05 00.
- 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**

## OVERHEAD COILING DOORS

### PART 1 GENERAL

#### 1.01 SECTION INCLUDES

- A. Overhead coiling doors , operating hardware, non-fire-rated, electric operation.
- B. Wiring from electric circuit disconnect to operator to control station.

#### 1.02 RELATED REQUIREMENTS

- A. Section 05 12 00 - Structural Framing: Support framing.
- B. Section 08 33 13 - Coiling Counter Doors.
- C. Section 08 33 26 - Overhead Coiling Grilles.
- D. Section 08 71 00 - Door Hardware: Cylinder cores and keys.
- E. Section 26 05 00 - Common Work Results for Electrical: Electrical connections.

#### 1.03 REFERENCE STANDARDS

- A. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2010.
- B. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum); National Electrical Manufacturers Association; 2008.
- C. NEMA ICS 2 - Industrial Control and Systems: Controllers, Contactors, and Overload Relays, Rated 600 2000 Volts; National Electrical Manufacturers Association; 2000 (R2008).
- D. NEMA MG 1 - Motors and Generators; National Electrical Manufacturers Association; 2011.
- E. UL (EAUED) - Electrical Appliance and Utilization Equipment Directory; Underwriters Laboratories Inc.; current edition.

#### 1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide general construction, component connections and details, electrical equipment .
- C. Shop Drawings: Indicate pertinent dimensioning, anchorage methods, hardware locations, and installation details.
- D. Samples: Submit two slats, 4x4 inch in size illustrating shape, color and finish texture.
- E. Manufacturer's Instructions: Indicate installation sequence and procedures, adjustment and alignment procedures.
- 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 Underwriters Laboratories Inc. as suitable for the purpose specified and indicated.

### PART 2 PRODUCTS

#### 2.01 MANUFACTURERS

- A. Overhead Coiling Doors:
  1. Cornell Iron Works, Inc; Product Model ESC10: [www.cornelliron.com](http://www.cornelliron.com).

**2.02 COILING DOORS**

- A. Non-Fire-Rated Interior Coiling Doors: Stainless steel slat curtain.
  - 1. Sandwich slat construction with insulated core.
  - 2. Nominal Slat Size: 1-1/2 inches wide x required length.
  - 3. Finish: No. 4.
  - 4. Guides: Formed track; stainless steel.
  - 5. Hood Enclosure: Manufacturer's standard; aluminum.
  - 6. Electric operation.
  - 7. Mounting: Within framed opening.

**2.03 MATERIALS**

- A. Curtain Construction: Interlocking slats.
  - 1. Slat Ends: Each slat 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. Weatherstripping: Moisture and rot proof, resilient type, located at jamb edges, bottom of curtain, and where curtain enters hood enclosure of all doors.
- B. Stainless Steel Slats: Minimum thickness, 22 gage, 0.031 inch, conforming to ASTM A 666, Type 304, rollable temper.
- C. Guide Construction: Continuous, of profile to retain door in place with snap-on trim, mounting brackets of same metal.
- D. Stainless Steel Guides: ASTM A 666, Type 304, rollable temper.
- E. Hood Enclosure: Internally reinforced to maintain rigidity and shape; stainless steel.
- F. Hardware:
  - 1. Lock Cylinders: Specified in Section 08 71 00.
- G. 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.

**2.04 ELECTRIC OPERATION**

- A. Electric Operators:
  - 1. Mounting: Side mounted.
  - 2. Motor Enclosure:
    - a. Interior doors: NEMA MG 1 Type 1; open drip proof.
  - 3. Motor Rating: Minimum 1/3 hp; continuous duty; sized for door size and weight.
  - 4. Motor Voltage: 120 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. Keyed Control Station: Standard three button (OPEN-STOP-CLOSE) momentary control for each operator.
  - 1. 24 volt circuit.
  - 2. Recessed.
- 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 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 05 00.
- 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**

## 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 05 12 00 - Structural Framing: Support framing.
- B. Section 08 33 23 - Overhead Coiling Doors.
- C. Section 26 05 00 - Common Work Results for Electrical: Electrical connections.
- D. Division 28 - Electronic Safety and Security: Access control.

#### 1.03 REFERENCE STANDARDS

- A. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2013.
- B. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes [Metric]; 2013.
- C. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum); National Electrical Manufacturers Association; 2008.
- D. NEMA ICS 2 - Industrial Control and Systems: Controllers, Contactors, and Overload Relays, Rated 600 V; National Electrical Manufacturers Association; 2000 (R2008).
- E. NEMA MG 1 - Motors and Generators; National Electrical Manufacturers Association; 2011.
- F. UL (EAUED) - Electrical Appliance and Utilization Equipment Directory; Underwriters Laboratories Inc.; current edition.

#### 1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide general construction, component connections and details, electrical equipment.
- C. Shop Drawings: Indicate pertinent dimensioning, anchorage methods, hardware locations, and installation details.
- D. Manufacturer's Instructions: Indicate installation sequence and procedures, adjustment and alignment procedures.
- E. Maintenance Data: Indicate lubrication requirements and frequency and periodic adjustments required.

#### 1.05 REGULATORY REQUIREMENTS

- A. Products Requiring Electrical Connection: Listed and classified by Underwriters Laboratories Inc. as suitable for the purpose specified and indicated.

### PART 2 PRODUCTS

#### 2.01 MANUFACTURERS

- A. Overhead Coiling Grilles:
  1. Cornell Iron Works, Inc; Product CrossingGard VisionAire ERG: [www.cornelliron.com](http://www.cornelliron.com).
  2. 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. Finish: Anodized, clear color.
  - 2. Electric operation.
  - 3. 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. Spacer spacing: 6 inch on center.
  - 4. Vertical links: 3/4 inch flat bar.
  - 5. Link spacing: 6 inch on center.
  - 6. Bar Ends: Provide with nylon runners for quiet operation.
  - 7. Bottom Bar: Back-to-back angles with tubular resilient cushion.
- C. Guides: Extruded aluminum angles, of profile to retain grille in place , mounting brackets of same metal.
- D. Hood Enclosure: 24 gage aluminum sheet; internally reinforced to maintain rigidity and shape.
  - 1. Finish: Anodized, clear color.
- E. Hardware:
  - 1. Lock Cylinders: Specified in Section 08 71 00.
- 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 (ASTM B221M).

**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: 110 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: 9 inches per second.
  - 8. Brake: Adjustable friction clutch type, activated by motor controller.
  - 9. Manual override in case of power failure.
- B. Control Station: Swipe Card/Proximity Card activated; coordinate with Division 28 - Electronic Safety and Security.
  - 1. 24 volt circuit.
  - 2. Recessed.
- 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 05 00.
- 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**

**OVERHEAD COILING GRILLES / DEPLOYABLE EXIT DOORS****PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Overhead coiling metal grilles and operating hardware, electric operation.
- B. Deployable egress doors.
- C. Wiring from electric circuit disconnect to operator to control station.

**1.02 RELATED REQUIREMENTS**

- A. Section 05 12 00 - Structural Framing: Support framing.
- B. Section 08 33 23 - Overhead Coiling Doors.
- C. Section 08 33 45 - Vertical Acting Fire Door Assembly.
- D. Section 09 90 00 - Painting and Coating: Field finished exposed steel components, frames and doors.
- E. Section 26 05 00 - Common Work Results for Electrical: Electrical connections.
- F. Division 28 - Electronic Safety and Security: Access control.

**1.03 REFERENCE STANDARDS**

- A. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2013.
- B. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2013.
- C. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2013.
- D. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes [Metric]; 2013.
- E. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum); National Electrical Manufacturers Association; 2008.
- F. NEMA ICS 2 - Industrial Control and Systems: Controllers, Contactors, and Overload Relays, Rated 600 V; National Electrical Manufacturers Association; 2000 (R2008).
- G. NEMA MG 1 - Motors and Generators; National Electrical Manufacturers Association; 2011.
- H. UL (EAUED) - Electrical Appliance and Utilization Equipment Directory; Underwriters Laboratories Inc.; current edition.

**1.04 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide general construction, component connections and details, electrical equipment.
- C. Shop Drawings: Indicate pertinent dimensioning, anchorage methods, hardware locations, and installation details.
- D. Manufacturer's Instructions: Indicate installation sequence and procedures, adjustment and alignment procedures.
- E. Maintenance Data: Indicate lubrication requirements and frequency and periodic adjustments required.

**1.05 REGULATORY REQUIREMENTS**

- A. Products Requiring Electrical Connection: Listed and classified by Underwriters Laboratories Inc. as suitable for the purpose specified and indicated.

**PART 2 PRODUCTS****2.01 MANUFACTURERS**

- A. Manufacturers:
  1. Safescape Model G1500 by McKeon Door Company: [www.mckeondoors.com](http://www.mckeondoors.com).
  2. 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. Finish: Anodized, clear color.
  2. Electric operation.
  3. Mounting: Surface mounted.
- B. Curtain: Round horizontal bars connected with vertical links.
  1. Horizontal bars: 5/16 inch diameter.
  2. Bar spacing: 2 inch on center.
  3. Tube spacers: 1/2 inch diameter.
  4. Spacer spacing: 4-1/2 inch on center.
  5. Vertical links: 5/8 inch flat bar.
  6. Link spacing: 9 inch on center.
  7. Bar Ends: Provide with nylon runners for quiet operation.
  8. Bottom Bar: Back-to-back angles with tubular resilient cushion.
- C. Guides: Galvanized steel angles, of profile to retain grille in place with snap-on trim, mounting brackets of same metal.
- D. Hood Enclosure: 22 gage galvanized steel sheet; internally reinforced to maintain rigidity and shape.
- E. Door Frame: Steel; minimum 14 gage; site finished to match color PT-1.
- F. Doors: Hollow steel; minimum 20 gage face sheets; site finished to match color PT-1.
- G. Hardware: Specified in Section 08 71 00.
- H. 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 (ASTM B221M).
- B. Galvanized Steel Bars: Galvanized to minimum coating thickness grade in accordance with ASTM A123/A123M.
- C. Galvanized Steel Sheet: ASTM A653/A653M, galvanized to minimum G90/Z275 coating.

**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: 1/3 hp; continuous duty, minimum.
  4. Motor Voltage: 110 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: Swipe Card/Proximity Card activated; coordinate with Division 28 - Electronic Safety and Security.
1. 24 volt circuit.
  2. Recessed.
- 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 and door 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 05 00.
- 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, door, and components.
- B. Remove labels and visible markings.

**END OF SECTION**

## FOLDING FIRE DOORS

### PART 1 GENERAL

#### 1.01 SECTION INCLUDES

- A. Horizontal sliding, accordion folding fire rated doors.
- B. Related construction.

#### 1.02 RELATED REQUIREMENTS

- A. Section 05 12 00 - Structural Steel Framing: Structural steel supports for door.
- B. Section 09 21 16 - Gypsum Board Assemblies: Fire rated gypsum board partition forming opening, track mounting, and storage pocket, if any.
- C. Section 09 90 00 - Painting and Coating: Finish painting.
- D. Section 26 05 00 - Common Work Results for Electrical: Electrical connections.
- E. Division 28 - Electronic Safety and Security: Fire alarm and access control.

#### 1.03 REFERENCE STANDARDS

- A. NFPA 70 - National Electrical Code; National Fire Protection Association; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- B. NFPA 80 - Standard for Fire Doors and Other Opening Protectives; 2013.
- C. UL 10B - Standard for Fire Tests of Door Assemblies; Underwriters Laboratories; Current Edition, Including All Revisions.

#### 1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide manufacturer's technical literature; include UL listing data.
- C. Shop Drawings: Indicate construction and installation details and dimensions, including layout, electrical requirements, required stacking depth, height of header above finished floor; and requirements for anchorage and support of each door.
- D. Selection Samples: Submit color charts for selection of finish color.
- E. Operation and Maintenance Data: Operating procedures, troubleshooting and repair methods, wiring diagrams, parts lists, and identification of authorized maintenance firms located in vicinity of project.

#### 1.05 QUALITY ASSURANCE

- A. Installer Qualifications: Approved by manufacturer; minimum three years of documented experience.

#### 1.06 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to the project site in manufacturer's original, unopened packaging, labeled to show name, brand and type.
- B. Store products in a protected dry location, in manufacturer's original packaging, in accordance with manufacturer's instructions.

### PART 2 PRODUCTS

#### 2.01 MANUFACTURERS

- A. Accordion Folding Fire Doors:
  1. Won-Door Corporation: [www.wondoors.com](http://www.wondoors.com).

2. Substitutions: See Section 01 60 00 - Product Requirements.

## **2.02 ACCORDION FIRE DOORS - GENERAL**

- A. Provide self-closing fire doors of configurations indicated on the drawings.
- B. Fire Rating: 180 minutes; provide products listed and labeled by UL as a fire door under UL 10B.
- C. Closing Operation: Automatic motor-operated closing upon activation by fire alarm system and by low battery charge.
  1. Obstruction Detection: Contact with an obstruction causes the door to stop and pause before attempting to re-close.
  2. Allow manual closing of door at any time.
- D. Opening Operation: Provide exit hardware on both sides of door.
  1. When door has been manually closed, operation of exit hardware shall open door completely.
  2. When door has been automatically closed, operation of exit hardware shall open door at least 32 inches, width programmable up to full opening width; pause for 3 seconds, then automatically close.
- E. Configuration: Single; straight; recessed in pocket.
  1. Clear Width: As indicated on Drawings.
  2. Clear Height: As indicated on Drawings.
  3. Pocket Depth: As required for fully recessed installation.
  4. Striker Mounting: Recessed.

## **2.03 COMPONENTS**

- A. Door Construction: Two parallel, accordion-type walls of panels independently suspended, 6 to 8 inches apart, with no pantographs or interconnections except at the lead-post.
  1. Panels: 24 gage, 0.0239 inch steel, V-grooved; connected by full height 24 gage (0.0239 inch) steel hinges.
  2. Insulation: Ceramic liner, 8 lb/cu ft.
  3. Lead Posts: 24 gage, 0.0239 inch cold rolled steel; internally mounted stabilizer bar; spring-loaded cap with PVC seals at top and bottom to fit into striker wall cavity; positive latching at striker wall.
  4. Smoke and Draft Seals: Continuous PVC sweeps attached at top and bottom.
  5. Hanging Weight: 6.5 pounds per sq ft, maximum.
  6. Finish: All steel parts factory-applied enamel.
  7. Color: Color as selected from manufacturer's optional colors.
- B. Suspension System: Two tracks, on 8 inch centers, attached to overhead structural support.
  1. Panel Hangers: Each panel individually suspended from a steel hanger pin and a 1/4 inch ball bearing roller.
  2. Lead Post Hangers: 8 wheel ball bearing trolley.
- C. Motor Operator Assembly: Chain drive attached to stabilizer bar trolley with DC gear-motor, drive sprocket and clutch.
- D. Power Supply: 12-volt maintenance-free DC battery, automatically maintained at capacity by continuous charger, 120 V AC.
- E. Controls: Microprocessor logic board, interconnect board, motor control relays, and limit switches; provide loud audible signal if sensors indicate high or low voltage, AC or DC; drive train, limit switch, or key switch malfunction; or ROM or RAM check-sum error.

## **2.04 RELATED CONSTRUCTION**

- A. Track Support Construction: Provide supports attached to structure and mounting surface for tracks; comply with door manufacturer's instructions and recommendations.

- B. Pocket Construction: Provide pocket for concealment of accordion door when open; comply with door manufacturer's instructions and recommendations.
  - 1. Depth: Calculated in accordance with manufacturer's guidelines.
  - 2. Pocket Door: Maintain full pocket clear width when pocket door is open.
    - a. Door: Solid core flush wood door with paint finish.
    - b. Frame: Hardwood, for paint finish; mounted flush with adjacent wall surface.
    - c. Hinges: Spring hinges mounted so door springs open; provide magnetic catch to hold door closed, with not more than 30 pounds force required to open catch.
- C. Striker Recess: Mount striker in wall recess deep enough to prevent striker from protruding beyond face of wall; construct recess to maintain fire rating of wall.

### **PART 3 EXECUTION**

#### **3.01 EXAMINATION**

- A. Verify that adjacent construction is suitable for installation of door.
- B. Verify that electrical utilities have been installed and are accessible.
- C. Verify access to, and proper clearance for, motor operators in wall cavity.
- D. Verify that door opening is plumb and header is level and of correct dimensions.
- E. Commencement of work indicates acceptance of substrate and opening.

#### **3.02 INSTALLATION**

- A. Install in accordance with manufacturer's instructions, shop drawings, and NFPA 80.
- B. Install fire doors plumb and level.
- C. Install wiring in accordance with applicable codes and NFPA 70.

#### **3.03 ADJUSTING**

- A. Adjust door installation to provide uniform clearances and smooth, quiet, non-binding operation.
- B. Test door closing functions under all anticipated conditions.
- C. Verify that all operations are functional and meet the requirements of the authorities having jurisdiction.

#### **3.04 CLEANING**

- A. Clean surfaces using manufacturer's recommended means and methods.

#### **3.05 PROTECTION**

- A. Protect installed work from damage.
- B. Repair or replace defective work prior to Substantial Completion.

**END OF SECTION**

**SECTIONAL DOORS****PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Overhead sectional doors, electrically operated.(OH-FG1)
- 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 08 80 00 - Glazing: Glazing for door lights.
- C. Section 22 05 00 - Common Work Results for Electrical: Electrical connections.
- D. Division 28 - Electronic Safety and Security: Access control systems.

**1.03 REFERENCE STANDARDS**

- A. ASTM E330/E330M - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference; 2014.
- B. DASMA 102 - American National Standard Specifications for Sectional Overhead Type Doors; Door & Access Systems Manufacturers' Association, International; 2011.
- C. NFPA 70 - National Electrical Code; National Fire Protection Association; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- D. 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. Shop Drawings: Indicate 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 two panel finish samples, 4 x 4 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.
- H. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

**1.05 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years of documented experience.
- B. Installer Qualifications: Company specializing in performing the work of this section with minimum three years of experience.
- C. Conform to applicable code for motor and motor control requirements.



- D. Products Requiring Electrical Connection: Listed and classified by Underwriters Laboratories Inc., as suitable for the purpose specified.

### **1.06 WARRANTY**

- A. See Section 01 78 00 - Closeout Submittals for warranty requirements.
- B. Correct defective Work within a five year period after Date of Substantial Completion.
- C. Warranty: Include coverage for electric motor and transmission.
- D. Provide five year manufacturer warranty for electric operating equipment.

## **PART 2 PRODUCTS**

### **2.01 MANUFACTURERS**

- A. Wayne Dalton, a Division of Overhead Door Corporation; Product Aluminum Full-View K-AL: [www.wayne-dalton.com/commercial](http://www.wayne-dalton.com/commercial).
- B. Other Acceptable Manufacturers:
  1. Fimbel Architectural Door Specialties: [www.fimbelads.com](http://www.fimbelads.com).
  2. Clopay Corporation: [www.clopaydoor.com](http://www.clopaydoor.com).
  3. Substitutions: See Section 01 60 00 - Product Requirements.

### **2.02 ALUMINUM DOOR COMPONENTS**

- A. Aluminum Doors: Flush aluminum, insulated; high lift operating style with track and hardware; complying with DASHA 102, Commercial application.
  1. Performance: Withstand positive and negative wind loads equal to 1.5 times design wind loads specified by local code without damage or permanent set, when tested in accordance with ASTM E330/E330M, using 10 second duration of maximum load.
  2. Thermal Performance: R-4.17.
  3. Door Nominal Thickness: 2 inches thick.
  4. Stile Width: 3 inches.
  5. Rail Width: 3 inches.
  6. Finish: Anodized, color as selected.
  7. Glazed Lights: Full panel width, one row; set in place with resilient glazing channel.
  8. Operation: Electric.
- B. Door Panels: Extruded aluminum stile and rail construction; internally insulated with polyurethane; screw joints; rabbeted weather joints at meeting rails.
- C. Glazing: Insulated safety glass units; 1/2 inch total unit thickness; outer pane of Low E clear safety glass, inner pane of clear safety glass; Solarban 70XL by PPG Industries: [www.ppg.com](http://www.ppg.com).

### **2.03 DOOR COMPONENTS**

- A. Track: Rolled galvanized steel, 0.090 inch thick; 2 or 3 inch wide, continuous one piece per side; galvanized steel mounting brackets 1/4 inch thick.
- B. Hinge and Roller Assemblies: Heavy duty hinges and adjustable roller holders of galvanized steel; floating hardened steel bearing rollers, located at top and bottom of each panel, each side.
- C. Lift Mechanism: Torsion spring on cross head shaft, with braided galvanized steel lifting cables.
- D. Sill Weatherstripping: Resilient hollow rubber strip, one piece; fitted to bottom of door panel, full length contact.
- E. Jamb Weatherstripping: Roll formed steel section full height of jamb, fitted with resilient weatherstripping, placed in moderate contact with door panels.
- F. Head Weatherstripping: EPDM rubber seal, one piece full length.
- G. Panel Joint Weatherstripping: Neoprene foam seal, one piece full length.

- H. Lock: Inside center mounted, adjustable keeper, spring activated latch bar with feature to retain in locked or retracted position; interior handle.
- I. Lock Cylinders: See Section 08 71 00.

## **2.04 ELECTRICAL OPERATION**

- A. Operator, Controls, Actuators, and Safeties: Comply with UL 325; provide products listed by a testing agency acceptable to authorities having jurisdiction.
- B. Electrical Characteristics:
  1. 1/2 hp ; manually operable in case of power failure, transit speed of 12 inches per second.
  2. 120 volts, single phase, 60 Hz.
- C. Wiring Terminations: Provide terminal lugs to match branch circuit conductor quantities, sizes, and materials indicated. Enclose terminal lugs in terminal box sized to NFPA 70.
- D. Disconnect Switch: Factory mount disconnect switch in control panel.
- E. Electric Operator: Side mounted on cross head shaft, adjustable safety friction clutch; brake system actuated by independent voltage solenoid controlled by motor starter; enclosed gear driven limit switch; enclosed magnetic cross line reversing starter; mounting brackets and hardware.
- F. Safety Edge: At bottom of door panel, full width; electro-mechanical sensitized type, wired to stop door upon striking object; hollow neoprene covered to provide weatherstrip seal.
- G. Control Station: Swipe Card/Proximity Card activated; coordinate with Division 28 - Electronic Safety and Security.
  1. 24 volt circuit.
  2. Recessed.

## **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.
- B. Apply primer to wood frame.

### **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 specified in Section 26 05 00. 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 during subsequent construction.
- B. Do not permit construction traffic through overhead door openings after adjustment and cleaning.

**END OF SECTION**

**ALL-GLASS ENTRANCES AND STOREFRONTS****PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. All-glass swinging doors.

**1.02 RELATED REQUIREMENTS**

- A. Section 08 43 13 - Aluminum-Framed Storefronts.
- B. Section 08 71 00 - Door Hardware.
- C. Section 08 80 00 - Glazing: Butt glazed interior lites.

**1.03 REFERENCE STANDARDS**

- A. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2010.
- B. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2014.
- C. ASTM C1036 - Standard Specification for Flat Glass; 2011e1.
- D. ASTM C1048 - Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass; 2012.

**1.04 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Manufacturer's descriptive literature for each component in all-glass entrance assembly.
- C. Shop Drawings: Drawings showing layout, dimensions, identification of components, and interface with adjacent construction.
  - 1. Include field measurements of openings.
  - 2. Include elevations showing:
    - a. Appearance of all-glass entrance layouts.
    - b. Locations and identification of manufacturer-supplied door hardware and fittings.
    - c. Locations and sizes of cut-outs and drilled holes for other door hardware.
- D. Operation and Maintenance Data: For manufacturer-supplied operating hardware.

**1.05 QUALITY ASSURANCE**

- A. Installer Qualifications: Minimum three years of experience installing entrance assemblies similar to those specified in this section.

**1.06 DELIVERY, STORAGE, AND HANDLING**

- A. Store products in manufacturer's unopened packaging until installation.

**PART 2 PRODUCTS****2.01 ASSEMBLIES**

- A. Swinging Door Fittings and Hardware:
  - 1. Top and bottom pivots concealed in patch fittings top and bottom.
  - 2. Floor Closer.
  - 3. Push/pulls: Locking ladder type.
  - 4. Single Doors: Floor mounted door stop.

**2.02 FITTINGS**

- A. Patch Style Fittings for Swinging Doors and Related Fixed Glazing:

1. Basis of Design: DORMA Glas, Inc; DORMA Universal PT10, PT20 and PT40 Patch Fittings: [www.dorma-usa.com](http://www.dorma-usa.com).
  2. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Floor Closer for Swinging Doors:
1. Basis of Design: DORMA Glas, Inc; DORMA BTS75VBF floor closure: [www.dorma-usa.com](http://www.dorma-usa.com).
  2. Substitutions: See Section 01 60 00 - Product Requirements.
- C. Locking Ladder Push/Pull: 48 inch length. At Door 102A.
1. Basis of Design: DORMA Glas, Inc; DORMA TG138 Locking Ladder Pull: [www.dorma-usa.com](http://www.dorma-usa.com).
  2. Substitutions: See Section 01 60 00 - Product Requirements.
- D. Non-Locking Ladder Push/Pull: 48 inch length. At Doors 119B and 203A.
1. Basis of Design: DORMA Glas, Inc; DORMA TG138 Non-Locking Ladder Pull: [www.dorma-usa.com](http://www.dorma-usa.com).
  2. Substitutions: See Section 01 60 00 - Product Requirements.
- E. Exposed Fittings and Hardware: Stainless steel, Number 4, satin polish finish.

### **2.03 MATERIALS**

- A. Glass: Tempered float glass meeting requirements of ASTM C1036, Type I, Quality Q3, fully tempered in accordance with ASTM C1048, Kind FT, and as follows:
1. Thickness: 1/2 inch.
  2. Color: Clear, Class 1.
  3. Prepare glazing panels for indicated fittings and hardware before tempering.
  4. Polish edges that will be exposed in finished work to bright flat polish.
  5. Temper glass materials horizontally; visible tong marks or tong mark distortions are not permitted.
- B. Stainless Steel Components: Conforming to ASTM A666, Type 304.
- C. Sealant: One-part silicone sealant, conforming to ASTM C920, clear.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify that openings are acceptable.
- B. Do not begin installation until substrates and openings have been properly prepared.
- C. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

### **3.02 PREPARATION**

- A. Clean substrates thoroughly prior to installation.
- B. Prepare substrates 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 instructions.
- B. Tolerances:
  1. Horizontal Components and Sight Lines: Not more than 1/8 inch in 10 feet variation from level, non-cumulative.
  2. Vertical Components and Sight Lines: Not more than 1/8 inch in 10 feet variation from plumb, non-cumulative.
  3. Variation from Plane or Indicated Location: Not more than 1/16 inch.

- C. Installation of door hardware not supplied by entrance/storefront manufacturer is specified in Section 08 71 00.

**3.04 ADJUSTING**

- A. Adjust doors to operate correctly, without binding to frame, sill, or adjacent doors.
- B. Adjust door hardware for smooth operation.

**3.05 CLEANING**

- A. Clean installed work to like-new condition.

**3.06 PROTECTION**

- A. Protect installed products until completion of project.
- B. Touch-up, repair or replace damaged products before Substantial Completion.

**END OF SECTION**

## AUTOMATIC ENTRANCES

### PART 1 GENERAL

#### 1.01 SECTION INCLUDES

- A. Packaged power-operated door assemblies.
- B. Controllers, actuators and safety devices.
- C. Glazing; site glazed.

#### 1.02 RELATED REQUIREMENTS

- A. Section 08 43 13 - Aluminum-Framed Storefront: Storefront system.
- B. Section 26 05 00 - Common Work Results for Electrical: Electrical connections.
- C. Division 28 - Electronic Safety and Security: Access control.
- D. Section 08 43 29 - Sliding Aluminum Storefronts: Exterior manual sliding glass doors.
- E. Section 08 80 00 - Glazing: Glazing materials.

#### 1.03 REFERENCE STANDARDS

- A. BHMA A156.10 - American National Standard for Power Operated Pedestrian Doors; Builders Hardware Manufacturers Association; 2011 (ANSI/BHMA A156.10).
- B. NEMA MG 1 - Motors and Generators; National Electrical Manufacturers Association; 2011.
- C. NFPA 70 - National Electrical Code; National Fire Protection Association; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

#### 1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings:
  - 1. Indicate layout and dimensions; head, jamb, and sill conditions; elevations; components, anchorage, recesses, materials, and finishes, electrical characteristics and connection requirements.
  - 2. Identify installation tolerances required, assembly conditions, routing of service lines and conduit, and locations of operating components and boxes.
- C. Product Data: Provide data on system components, sizes, features, and finishes.
- D. Manufacturer's Installation Instructions: Indicate special procedures, perimeter conditions requiring special attention, and manufacturer's hardware and component templates.
- E. Maintenance Data: Include manufacturer's parts list and maintenance instructions for each type of hardware and operating component.
- F. Warranty: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.
- G. 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. Wrenches and other tools required for maintenance of equipment.

#### 1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years of documented experience.
- B. Installer Qualifications: Company specializing in performing the work of this section with minimum three years of experience.

**1.06 WARRANTY**

- A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.
- B. Provide two year manufacturer warranty.
- C. Provide five year manufacturer warranty against failure of glass seal on insulating glass units, including interpane dusting or misting. Include provision for replacement of failed units.

**PART 2 PRODUCTS****2.01 MANUFACTURERS**

- A. Sliding Automatic Entrance Door Assemblies:
  - 1. Tormax TX9200AC Bi-Part Outside Sliding Doors by Tormax Technologies, Inc:  
www.tormaxusa.com.
  - 2. Substitutions: See Section 01 60 00 - Product Requirements.

**2.02 POWER OPERATED DOORS**

- A. All Power Operated Doors: Provide products that comply with the requirements of the authorities having jurisdiction; unless otherwise indicated, provide equipment selected for the actual weight of the doors and for light pedestrian traffic.
  - 1. Sliding and Folding Door Operators: In the event of power failure, provide for manual open, close, and break-away operation of door leaves except as noted below.
    - a. Interior Doors 151D, 153D and 155C: No break-away operation.
  - 2. Packaged Door Assemblies: Provide all components by single manufacturer, factory-assembled, including doors, frames, operators, actuators, and safeties.
  - 3. Exterior and Vestibule Doors: Provide equipment suitable for operating temperature range of minus 20 to plus 140 degrees F ambient.
  - 4. Threshold and Stools: One piece extruded aluminum, non-slip surface.
    - a. Entry Doors 101A and 101B: Surface combination type, bevel on exterior and Lobby side, square at Vestibule side; ADA compliant.
    - b. Interior Doors 151D, 153D and 155C: Recess installation, square both sides.
- B. Sliding and Folding Doors with Full Power Operators: Comply with BHMA A156.10; safeties required; provide break-away operation unless otherwise indicated; in the event of break-away operation, interrupt power operation.
- C. Operators:
  - 1. Electric Operators: 1/8 hp minimum, self-contained, belt driven, with release clutch.

**2.03 PACKAGED AUTOMATIC ENTRANCE DOOR ASSEMBLIES**

- A. Sliding Automatic Door : Bi-parting double leaf track-mounted, electric operation, extruded aluminum glazed door, with frame, sidelights, and operator concealed overhead.
  - 1. Operation: Power open, spring close operation.
  - 2. Lock: Electric.
  - 3. Actuator(s):
    - a. Entry Doors 101A and 101B: Proximity detector.
    - b. Interior Doors 151D, 153D and 155C: Push button activator, wall and mullion mounted.
  - 4. Hold Open: Toggle switch at inside head of doors; this is not a fire-rated door.
  - 5. Emergency Egress: Panic exit release operation on active leaves.
  - 6. Finish: Class I natural anodized.
  - 7. Glass: Insulated safety glass units as specified in Section 08 80 00 - Glazing.

**2.04 CONTROLLERS, ACTUATORS, AND SAFETIES**

- A. Controller: Provide microprocessor operated controller for each door.
  - 1. System to interface with building security system specified in Division 28 - Electronic Safety and Security.



- B. Comply with BHMA A156.10 for actuator and safety types and zones.
- C. Proximity Detector Actuator/Safety: Passive infrared; distance of control sensitivity adjustable.
- D. Push Button Actuator (Mullion and Wall): Standard momentary contact type, wall mounted, recessed; 1-1/2 x 4-1/2 inches; stainless steel escutcheon plate; handicap symbol.
  - 1. TA-8100 Series Mullion Push Button by K.M. Thomas Ltd: [www.kmthomas.ca](http://www.kmthomas.ca).
  - 2. Substitutions: See Section 01 60 00 - Product Requirements.

**2.05 ELECTRICAL CHARACTERISTICS AND COMPONENTS**

- A. Electrical Characteristics:
  - 1. 120 volts, single phase, 60 Hz.
- B. Motors: NEMA MG 1.
- C. Wiring Terminations: Provide terminal lugs to match branch circuit conductor quantities, sizes, and materials indicated. Enclose terminal lugs in terminal box sized to NFPA 70.
- D. Disconnect Switch: Factory mount disconnect switch in control panel.

**2.06 FINISHES**

- A. Class I Natural Anodized Finish: AAMA 611 AA-M12C22A41 Clear anodic coating or AAMA 612 clear anodic coating with electrolytically deposited organic seal; not less than 0.7 mils thick.

**PART 3 EXECUTION**

**3.01 EXAMINATION**

- A. Verify that openings and recesses are ready to receive work and dimensions are as indicated on shop drawings.
- B. Verify that electric power is available and is of the correct characteristics.

**3.02 INSTALLATION**

- A. Install equipment, glass and glazing in accordance with manufacturer's instructions.
- B. Provide for thermal expansion and contraction of door and frame units and live and dead loads that may be transmitted to operating equipment.
- C. Provide for dimensional distortion of components during operation.
- D. Coordinate installation of components with related and adjacent work; level and plumb.

**3.03 ADJUSTING**

- A. Adjust door equipment for correct function and smooth operation.

**3.04 CLEANING**

- A. Remove temporary protection, clean exposed surfaces.

**3.05 CLOSEOUT ACTIVITIES**

- A. Demonstrate operation, operating components, adjustment features, and lubrication requirements.

**END OF SECTION**

## ALUMINUM-FRAMED STOREFRONTS

### PART 1 GENERAL

#### 1.01 SECTION INCLUDES

- A. Aluminum-framed storefront.
- B. Infill panels of glass.
- C. Aluminum doors and frames.
- D. Weatherstripping.
- E. Door hardware.
- F. Perimeter sealant.
- G. Transition assembly.

#### 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 00 00 - Door and Frame Schedule.
- D. Section 08 42 29 - Automatic Entrances.
- E. Section 08 43 29 - Sliding Aluminum Storefronts.
- F. Section 08 44 13 - Glazed Aluminum Curtain Walls.
- G. Section 08 71 00 - Door Hardware: Hardware items other than specified in this section.
- H. 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 611 - Voluntary Specification for Anodized Architectural Aluminum; American Architectural Manufacturers Association; 2012.
- C. AAMA 2604 - Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels; 2013.
- D. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2012.
- E. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2013.
- F. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2010.
- G. ASTM B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate [Metric]; 2010.
- H. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2013.
- I. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes [Metric]; 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/E330M - 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; 2000 (Reapproved 2009).
- M. 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. Preinstallation Meeting: Conduct a preinstallation meeting one week before starting work of this section; require attendance by all affected installers.

#### **1.05 SUBMITTALS**

- A. See Section 01 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 .
- 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. Hardware Schedule: Complete itemization of each item of hardware to be provided for each door, cross-referenced to door identification numbers in Contract Documents.
- E. Samples: Submit two samples 4 x 4 inches in size illustrating finished aluminum surface.
- F. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

#### **1.06 QUALITY ASSURANCE**

- A. Manufacturer and Installer Qualifications: Company specializing in manufacturing aluminum glazing systems with minimum three years of documented experience.

#### **1.07 MOCK-UP**

- A. See Section 01 40 00 Quality Requirements, for general requirements for mock-ups.
- B. Provide mock-up including all components occurring on project. Assemble to illustrate component assembly including glazing materials, weep drainage system, attachments, anchors, and perimeter sealant.
- C. Locate on-site where directed. Mock-up may remain as part of the Work.

#### **1.08 DELIVERY, STORAGE, AND HANDLING**

- A. Handle products of this section in accordance with AAMA CW-10.
- B. Protect finished aluminum surfaces with wrapping. Do not use adhesive papers or sprayed coatings that bond to aluminum when exposed to sunlight or weather.

#### **1.09 FIELD CONDITIONS**

- A. Do not install sealants when ambient temperature is less than 40 degrees F. Maintain this minimum temperature during and 48 hours after installation.

**1.10 WARRANTY**

- A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.
- B. Correct defective Work within a two year period after Date of Substantial Completion.
- C. Provide five year manufacturer warranty against excessive degradation of exterior finish. Include provision for replacement of units with excessive fading, chalking, or flaking.

**PART 2 PRODUCTS****2.01 MANUFACTURERS**

- A. Basis of Design: Kawneer Company, Inc; Product Trifab VG 451T Storefront System, NX-3500 Awning Operable Sash and NX-3100 Outswing Operable Sash and Heavy Duty Entrance Doors: [www.kawneer.com](http://www.kawneer.com).
- B. Aluminum-Framed Storefront and Doors:
  - 1. Arcadia Inc: [www.arcadiainc.com](http://www.arcadiainc.com).
  - 2. Oldcastle BuildingEnvelope: [www.oldcastlebe.com](http://www.oldcastlebe.com).
  - 3. United States Aluminum Corp: [www.usalum.com](http://www.usalum.com).
  - 4. Substitutions: See Section 01 60 00 - Product Requirements.

**2.02 STOREFRONT**

- A. Aluminum-Framed Storefront: Factory fabricated, factory finished aluminum framing members with infill, and related flashings, anchorage and attachment devices.
  - 1. Glazing Position: Centered (front to back).
  - 2. Vertical Mullion Dimensions: 2 inches.
  - 3. Finish: Class I natural anodized.
    - a. Factory finish all surfaces that will be exposed in completed assemblies.
    - b. 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 and hardware; fasteners and attachments concealed from view; reinforced as required for imposed loads.
  - 5. Construction: Eliminate noises caused by wind and thermal movement, prevent vibration harmonics, and prevent "stack effect" in internal spaces.
  - 6. System Internal Drainage: Drain to the exterior by means of a weep drainage network any water entering joints, condensation occurring in glazing channel, and migrating moisture occurring within system.
  - 7. Expansion/Contraction: Provide for expansion and contraction within system components caused by cycling temperature range of 170 degrees F over a 12 hour period without causing detrimental effect to system components, anchorages, and other building elements.
  - 8. Movement: Allow for movement between storefront and adjacent construction, without damage to components or deterioration of seals.
  - 9. Perimeter Clearance: Minimize space between framing members and adjacent construction while allowing expected movement.
  - 10. Air and Vapor Seal: Maintain continuous air barrier and vapor retarder throughout assembly, primarily in line with inside pane of glazing and inner sheet of infill panel and heel bead of glazing compound.
- B. Performance Requirements:
  - 1. Wind Loads: Design and size components to withstand the specified load requirements without damage or permanent set, when tested in accordance with ASTM E330/E330M, using loads 1.5 times the design wind loads and 10 second duration of maximum load.
    - a. Member Deflection: Limit member deflection to flexure limit of glass in any direction, with full recovery of glazing materials.
  - 2. Water Penetration Resistance: No uncontrolled water on interior face, when tested in accordance with ASTM E331 at pressure differential of 8.00 lbf/sq ft.

3. Air Leakage: Maximum of 0.06 cu ft/min/sq ft of wall area, when tested in accordance with ASTM E283 at 6.27 pounds per square foot pressure differential across assembly.

### 2.03 COMPONENTS

- A. Aluminum Framing Members: Tubular aluminum sections, thermally broken with interior section insulated from exterior, drainage holes and internal weep drainage system.
  1. Framing members for interior applications need not be thermally broken.
  2. Glazing stops: Flush.
  3. Thermal Flashing: Extruded aluminum with sealed end dams.
- B. Glazing: As specified in Section 08 80 00 - Glazing.
- C. Swing Doors: Glazed aluminum.
  1. Thickness: 2 inches.
  2. Top Rail: 5 inches wide.
  3. Vertical Stiles: 5 inches wide.
  4. Bottom Rail: 10 inches wide.
  5. Glazing Stops: Square.
  6. Finish: Same as storefront.
- D. Operable Sash: Aluminum awning; finished to match storefront; ADA compliant turn handle latch with manufacturer's standard insect screen.
  1. High Performance Organic Finish; interior color to match clear anodized aluminum; exterior color to match wall panels specified in Section 07 42 13.16 - Metal Plate Wall Panels (AYW Yellow).
- E. Operable Sash: Aluminum Overlap Outswing; finished to match storefront; ADA compliant turn handle latch with manufacturer's standard insect screen.
  1. High Performance Organic Finish; interior color to match clear anodized aluminum; exterior color to match wall panels specified in Section 07 42 13.16 - Metal Plate Wall Panels (AYW Yellow).

### 2.04 MATERIALS

- A. Extruded Aluminum: ASTM B221 (ASTM B221M).
- B. Sheet Aluminum: ASTM B209 (ASTM B209M).
- C. Structural Steel Sections: ASTM A36/A36M; galvanized in accordance with requirements of ASTM A123/A123M.
- D. Fasteners: Stainless steel.
- E. Perimeter Sealant: Type B- MS Polymer specified in Section 07 90 05.
- F. Transition Assembly: Pre-engineered aluminum, extruded silicone, and silicone sealant components to transition between Weather Resistant Membrane and aluminum window system.
  1. Proglaze ETA Engineered Transition Assembly by Tremco Commercial Sealants & Waterproofing: [www.tremcosealants.com](http://www.tremcosealants.com)
  2. Substitutions: See Section 01 60 00 - Product Requirements.
- G. Glazing Gaskets: Type to suit application to achieve weather, moisture, and air infiltration requirements.
- H. Glazing Accessories: As specified in Section 08 80 00.
- I. Touch-Up Primer for Galvanized Steel Surfaces: SSPC-Paint 20, zinc rich.
- J. Rigid Insulation (At Spandrel Glass): Rigid insulation panel with aluminum facer, 4 inch thickness.

**2.05 FINISHES**

- A. Typical: Class I Natural Anodized Finish: AAMA 611 AA-M12C22A41 Clear anodic coating or AAMA 612 clear anodic coating with electrolytically deposited organic seal; not less than 0.7 mils thick.
- B. Operable Sash: High Performance Organic Finish: AAMA 2604; multiple coats, thermally cured fluoropolymer system.

**2.06 HARDWARE**

- A. For each door, include weatherstripping, sill sweep strip, and threshold.
- B. Other Door Hardware: Storefront manufacturer's standard type to suit application.
  - 1. Finish on Hand-Contacted Items: Polished chrome.
  - 2. For each door, include butt hinges, pivots, push handle, pull handle, exit device, narrow stile handle latch, and closer.
- C. Threshold: Extruded aluminum, one piece per door opening, ribbed surface; provide on all doors.
- D. Automatic Door Operators and Actuators: As specified in Section 08 42 29.

**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 extruded aluminum sill and jamb flashings. Install end dams and seal water-tight.
- 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. Transition System: Install in accordance with manufacturer's instructions.
  - 1. Seal to water resistant membrane and aluminum window system.
  - 2. Use premolded corners where possible.
- J. Pack fibrous insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.
- K. Install operating sash.
- L. Set thresholds in bed of mastic and secure.
- M. Install hardware using templates provided.
  - 1. See Section 08 71 00 for hardware installation requirements.

- N. Install glass in accordance with Section 08 80 00, using glazing method required to achieve performance criteria.
- O. Install perimeter sealant in accordance with Section 07 90 05.
- P. Touch-up minor damage to factory applied finish; replace components that cannot be satisfactorily repaired.
- Q. Spandrel Glass:
  1. Install in accordance with manufacturer's recommendations.
  2. Allow gap between inside face of spandrel glass and face of insulation installation; provide formed aluminum sheet backing to secure insulation as required.
  3. Provide venting and weeps to prevent condensation from forming within system.

### **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 ADJUSTING**

- A. Adjust operating hardware and sash for smooth operation.

### **3.05 CLEANING**

- A. Remove protective material from pre-finished aluminum surfaces.
- B. Wash down surfaces with a solution of mild detergent in warm water, applied with soft, clean wiping cloths. Take care to remove dirt from corners. Wipe surfaces clean.
- C. Remove excess sealant by method acceptable to sealant manufacturer.

### **3.06 PROTECTION**

- A. Protect installed products from damage during subsequent construction.

**END OF SECTION**

## SLIDING ALUMINUM STOREFRONTS

### PART 1 GENERAL

#### 1.01 SECTION INCLUDES

- A. Exterior sliding doors and frames.
- B. Glazing; site glazed.
- C. Operating hardware.

#### 1.02 RELATED REQUIREMENTS

- A. Section 05 50 00 - Metal Fabrications: Steel supports.
- B. Section 07 90 05 - Joint Sealers: Perimeter sealant and backup materials.
- C. Section 08 71 00 - Door Hardware: Cylinder locks.
- D. Section 08 80 00 - Glazing: Product requirements for glass units.

#### 1.03 REFERENCE STANDARDS

- A. AAMA CW-10 - Care and Handling of Architectural Aluminum From Shop to Site; American Architectural Manufacturers Association; 2004.
- B. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels; 2005.
- C. ASTM B 221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2008.
- D. ASTM B 221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric); 2007.
- E. ASTM E 283 - 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.
- F. ASTM E 330 - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference; 2002 (Reapproved 2010).
- G. ASTM E 331 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference; 2000 (Reapproved 2009).
- H. ASTM E 547 - Standard Test Method for Water Penetration of Exterior Windows, Curtain Walls, and Doors by Cyclic Static Air Pressure Differential.
- I. ASTM F 842 - Standard Test Methods For Measuring the Forced Entry Resistance of Sliding Door Assemblies, Excluding Glazing Impact; 2004.

#### 1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide component dimensions.
- C. Shop Drawings: Indicate opening dimensions, framed opening tolerances, and installation requirements.
- D. Samples: Submit two samples, 4 x 4 inch in size illustrating finish.
- E. 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 aluminum storefronts with not fewer than five 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 FIELD CONDITIONS**

- A. Do not install sealants when ambient temperature is less than 40 degrees F.
- B. Maintain this minimum temperature during and 24 hours after installation of sealants.

**1.08 WARRANTY**

- A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.
- B. Correct defective Work within a two year period after Date of Substantial Completion.
- C. Provide five year manufacturer warranty against failure of glass seal on insulating glass units, including interpane dusting or misting. Include provision for replacement of failed units.

**PART 2 PRODUCTS****2.01 MANUFACTURERS**

- A. Aluminum Sliding Door System:
  1. Tormax Series TX9200 Outside Slide Manual Door System by Tormax Technologies, Inc: [www.tormaxusa.com](http://www.tormaxusa.com).
  2. Substitutions: See Section 01 60 00 - Product Requirements.

**2.02 SLIDING GLASS DOOR SYSTEM**

- A. Sliding Door System: Extruded aluminum framed, sliding doors and sidelights, header and jambs; vision glass, threshold, related flashings, anchorage and attachment devices.
  1. Configuration: Fixed and horizontal sliding panels as indicated on drawings; internal pulley system to operate both doors.
  2. Operation: Manual, interconnected for simultaneous operation of both door leaves.
  3. Finish: Class I natural anodized.
    - a. Factory finish all surfaces that will be exposed in completed assemblies.
    - b. Coat concealed metal surfaces that will be in contact with cementitious materials or dissimilar metals with bituminous paint.
  4. Sizes: Allow for tolerances of rough framed openings, clearances, and shims around perimeter of assemblies.
  5. Sills and Stools: One piece; slope sills for wash; ADA compliant.
  6. Drainage: Provide drainage to exterior for moisture entering joints and glazing spaces and for condensation occurring within frame construction.
  7. Install glass in fixed and sliding units in accordance with manufacturer's standard method.
- B. Performance Requirements:
  1. Design and size components to withstand the following load requirements, when tested in accordance with ASTM E 330:
    - a. Positive wind load: 95 lbf/sq ft.
    - b. Negative wind load: 95 lbf/sq ft.
    - c. Member deflection: Limit member deflection to flexure limit of glass in any direction, with full recovery of glazing materials.

2. System Internal Drainage: Drain to the exterior by means of a weep drainage network any water entering joints, condensation occurring in glazing channel, or migrating moisture occurring within system.
3. Thermal Movement: Design sections to permit thermal expansion and contraction of components to match perimeter opening construction.
4. Air Infiltration: Limit air infiltration through assembly to 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 E 283.
5. Water Leakage: None, when measured in accordance with ASTM E 331 with a test pressure difference of 2.86 lbf/sq ft.
6. Forced Entry Resistance: ASTM F 842 requirements for door Type A, Grade 10.

### **2.03 COMPONENTS**

- A. Unit Frame :
  1. Profile: 4-1/2 x 1-3/4 minimum size.
  2. Construction: Extruded aluminum with screw lock corner construction.
- B. Fixed and Sliding Frame:
  1. Profile: 2-5/16 x 1-13/16 inch minimum size top and side rails; 5 x 1-3/4 inch bottom rail.
  2. Construction: Extruded aluminum with screw lock corner construction.
- C. Header:
  1. Profile: Nominal 8 x 8 inches.
  2. Construction: Extruded aluminum with removal access cover.
- D. Glass Stops: Formed aluminum, sloped for wash. Form weather stop flange.
- E. Weatherstripping: Standard with manufacturer to meet performance requirements.

### **2.04 MATERIALS**

- A. Extruded Aluminum: ASTM B 221 (ASTM B 221M), 6063 alloy, T5 temper, thermally broken, hollow tubular sections.
- B. Glass and Glazing Materials: Insulated safety glass units, specified in Section 08 80 00 - Glazing.
- C. Bituminous Paint: Fibered asphaltic type.
- D. Sealant and Backing Materials: As specified in Section 07 90 05.

### **2.05 HARDWARE**

- A. Support Header: Overhead suspension track; nylon wheels with self-lubricating ball bearing centers.
- B. Pull Handles: Manufacturer's standard type.
  1. Finish: As selected by Architect from manufacturer's standard range.
- C. Track/Threshold: Stainless steel, recessed, sloped to exterior; mill finish; ADA compliant.
- D. Limit Stops: Resilient rubber.
- E. Locking Mechanism: Heavy duty stainless steel hookbolt; to accept lock cylinder specified in Section 08 71 00 - Door Hardware.

### **2.06 FINISHES**

- A. Class I Natural Anodized Finish: AAMA 611 AA-M12C22A41 Clear anodic coating or AAMA 612 clear anodic coating with electrolytically deposited organic seal; not less than 0.7 mils thick.

**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 PREPARATION**

- A. Prepare opening to permit correct installation of door unit in conjunction with air and vapor seal.
- B. Apply coat of bituminous paint on concealed aluminum surfaces in contact with cementitious or dissimilar materials.

**3.03 INSTALLATION**

- A. Install door unit assembly, glass and glazing, and hardware in accordance with manufacturer's instructions.
- B. Attach frame and shims to perimeter opening to accommodate construction tolerances and other irregularities.
- C. Use anchorage devices to securely fasten sliding door assembly to wall construction without distortion or imposed stresses.
- D. Coordinate installation of loose fibrous thermal insulation at shim spaces at frame perimeter as specified in Section 07 21 00.
- E. Place threshold in bed of butyl sealant.
- F. Install perimeter sealant in accordance with requirements of Section 07 90 05.
- G. Install glass in fixed and sliding units in accordance with manufacturer's recommendations.

**3.04 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**

- A. Adjust hardware for smooth operation.

**3.06 CLEANING**

- A. Remove protective material from factory finished surfaces.
- B. Remove labels and visible markings.
- C. Wash surfaces by method recommended and acceptable to sealant and window manufacturer; rinse and wipe surfaces clean.

**3.07 PROTECTION**

- A. Protect installed products from damage during subsequent construction activities.

**END OF SECTION**

**GLAZED ALUMINUM CURTAIN WALLS****PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Aluminum-framed curtain wall, with vision glazing and glass infill panels.
- B. Integrated sun screens.
- C. Closure panels.
- D. Perimeter sealant.
- E. Transition Assembly.

**1.02 RELATED REQUIREMENTS**

- A. Section 01 62 11 - Delegated Design: Requirements for design-build components and systems; regulatory submittals.
- B. Section 05 12 00 - Structural Steel Framing: Steel attachment members.
- C. Section 07 25 00 - Weather Barriers: Perimeter air and vapor seal between glazing system and adjacent construction.
- D. Section 07 90 05 - Joint Sealers: Perimeter sealant and back-up materials.
- E. Section 08 43 13 - Aluminum-Framed Storefronts: Entrance framing and doors.
- F. Section 08 80 00 - Glazing.

**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 501.1 - Standard Test Method for Exterior Windows, Curtain Walls and Doors for Water Penetration Using Dynamic Pressure; American Architectural Manufacturers Association; 2005.
- C. AAMA 611 - Voluntary Specification for Anodized Architectural Aluminum; American Architectural Manufacturers Association; 2012.
- D. AAMA 1503 - Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors and Glazed Wall Sections; American Architectural Manufacturers Association; 2009.
- E. ASCE 7 - Minimum Design Loads for Buildings and Other Structures; American Society of Civil Engineers; 2011.
- F. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2012.
- G. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2013.
- H. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2010.
- I. ASTM B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate [Metric]; 2010.
- J. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2013.
- K. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes [Metric]; 2013.

- L. 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).
- M. SSPC-Paint 20 - Zinc-Rich Primers (Type I, "Inorganic," and Type II, "Organic"); Society for Protective Coatings; 2002 (Ed. 2004).

#### **1.04 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide component dimensions, describe components within assembly, anchorage and fasteners, 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 two samples 4 x 4 inches in size illustrating finished aluminum surface, glazing, infill panels, glazing materials.
- 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. Manufacturer's Certificate: Certify that the products supplied meet or exceed the specified requirements.
- G. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.
- H. Regulatory Submittals (Deferred Permit Submittals): Submit design drawings, shop drawings, and calculations sealed by a Professional Structural Engineer licensed in Oregon code authority for review and approval.

#### **1.05 QUALITY ASSURANCE**

- A. Designer Qualifications: Design structural support framing components under direct supervision of a Professional Structural Engineer experienced in design of this Work and licensed at Oregon.
- B. Manufacturer and Installer Qualifications: Company specializing in manufacturing aluminum glazing systems with minimum three years of documented experience.

#### **1.06 MOCK-UP**

- A. See Section 01 40 00 Quality Requirements, for general requirements for mock-ups.
- B. Provide mock-up including all components occurring on project. Assemble to illustrate component assembly including glazing materials, weep drainage system, attachments, anchors, and perimeter sealant.
- C. Locate on-site where directed. Mock-up may remain as part of the Work.

#### **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 00 - Closeout Submittals, for additional warranty requirements.
- B. Correct defective Work within a five year period after Date of Substantial Completion.
- C. Provide five year manufacturer warranty against excessive degradation of exterior finish. Include provision for replacement of units with excessive fading, chalking, or flaking.

**PART 2 PRODUCTS****2.01 MANUFACTURERS**

- A. Kawneer Company, Inc; Product 1600 Series Curtain Wall System 1 (Outside Glazed): [www.kawneer.com](http://www.kawneer.com).
- B. Glazed Aluminum Curtain Wall:
  - 1. Oldcastle BuildingEnvelope: [www.oldcastlebe.com](http://www.oldcastlebe.com).
  - 2. United States Aluminum Corp: [www.usalum.com](http://www.usalum.com).
  - 3. Wausau Window and Wall Systems: [www.wausauwindow.com](http://www.wausauwindow.com).
  - 4. Substitutions: See Section 01 60 00 - Product Requirements.

**2.02 CURTAIN WALL**

- A. Aluminum-Framed Curtain Wall: Factory fabricated, factory finished aluminum framing members with infill, and related flashings, anchorage and attachment devices.
  - 1. 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: Class I natural anodized.
    - a. Factory finish all surfaces that will be exposed in completed assemblies.
    - b. 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 inner sheet of infill panel and heel bead of glazing compound.
  - 8. Perimeter Clearance: Minimize space between framing members and adjacent construction while allowing expected movement.
- B. Structural Performance Requirements: Design and size components to withstand the following load requirements without damage or permanent set.
  - 1. Design Wind Loads: Comply with the following:
  - 2. Seismic Loads: Design and size components to withstand seismic loads and sway displacement in accordance with the requirements of ASCE 7.
  - 3. Movement: Accommodate the following movement without damage to components or deterioration of seals:
    - a. Expansion and contraction caused by 180 degrees F surface temperature.
    - b. Expansion and contraction caused by cycling temperature range of 170 degrees F over a 12 hour period.
    - c. Movement of curtain wall relative to perimeter framing.
    - d. Deflection of structural support framing, under permanent and dynamic loads.
- C. Water Penetration Resistance: No uncontrolled water on indoor face when tested as follows:
  - 1. Test Pressure Differential: 15 lbf/sq ft.

- 2. Test Method: AAMA 501.1.
- D. Air Leakage: Maximum of 0.06 cu ft/min/sq ft of wall area, when tested in accordance with ASTM E283 at 6.27 pounds per square foot pressure differential across assembly.
- E. Thermal Performance Requirements:
  - 1. Condensation Resistance Factor of Framing: 50, minimum, measured in accordance with AAMA 1503.

### 2.03 COMPONENTS

- A. Aluminum Framing Members: Tubular aluminum sections, thermally broken with interior section insulated from exterior, drainage holes and internal weep drainage system.
  - 1. Cap Profiles: As indicated on Drawings.
  - 2. Structurally Reinforced Members: Extruded aluminum with internal reinforcement of structural steel member.
- B. Glazing: As specified in Section 08 80 00.
- C. Closure Panels: 1/8 inch thick aluminum sheet.
  - 1. Exterior Finish: Class I natural anodized.
  - 2. Interior Finish: Clear anodized.
- D. Sun Screens: Shop fabricated, shop finished, extruded aluminum outriggers, louvers, and fascia, free of defects impairing strength, durability or appearance.
  - 1. Sun Screen Configuration: As indicated on drawings (Similar to Kawneer Versoleil).
  - 2. Louver Type: Airfoil; 14 inch width.
  - 3. Sun Screen Angle: 90 degrees from horizontal.
  - 4. Outrigger Shape: Straight.
  - 5. Design Criteria: Design and fabricate to resist the same loads as curtain wall system as well as the following loads without failure, damage, or permanent deflection:
    - a. Snow: 25 psf; minimum.
    - b. Live: 25 psf; minimum.
    - c. Thermal Movement: Plus/minus 1/8 inch, maximum.
  - 6. Configuration and Size: As indicated on drawings.
    - a. Horizontal alignment.
    - b. Spacing: As indicated on Drawings.
  - 7. Shop fabricate to the greatest extent possible; disassemble if necessary for shipping.
  - 8. Finish: To match curtainwall system.

### 2.04 MATERIALS

- A. Extruded Aluminum: ASTM B221 (ASTM B221M).
- B. Sheet Aluminum: ASTM B209 (ASTM B209M).
- C. Structural Steel Sections: ASTM A36/A36M; galvanized in accordance with requirements of ASTM A123/A123M.
- D. Structural Supporting Anchors: See Section 05 12 00.
- E. Structural Supporting Anchors Attached to Structural Steel: Design for bolted attachment.
- F. Structural Supporting Anchors Attached to Reinforced Concrete Members: Design for welded attachment to weld plates embedded in concrete.
- G. Fasteners: Stainless steel; type as required or recommended by curtain wall manufacturer.
- H. Perimeter Sealant: Type B - MS Polymer specified in Section 07 90 05.
- I. Glazing Gaskets: Type to suit application to achieve weather, moisture, and air infiltration requirements.
- J. Glazing Accessories: As specified in Section 08 80 00.

- K. Transition Assembly: Pre-engineered aluminum, extruded silicone, and silicone sealant components to transition between Weather Resistant Membrane and aluminum window system.
  1. Proglaze ETA Engineered Transition Assembly by Tremco Commercial Sealants & Waterproofing: [www.tremcosealants.com](http://www.tremcosealants.com)
  2. Substitutions: See Section 01 60 00 - Product Requirements.
- L. Touch-Up Primer for Galvanized Steel Surfaces: SSPC-Paint 20, zinc rich.

## 2.05 FINISHES

- A. Class I Natural Anodized Finish: AAMA 611 AA-M12C22A41 Clear anodic coating or AAMA 612 clear anodic coating with electrolytically deposited organic seal; not less than 0.7 mils thick.
- B. Touch-Up Materials: As recommended by coating manufacturer for field application.
- C. Reinforce framing members at door opening; coordinate with doors specified in Section 08 43 13.

## 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. 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. Install vertical support at interior of outside glazed corner.
- E. Align assembly plumb and level, free of warp or twist. Maintain assembly dimensional tolerances, aligning with adjacent work.
- F. Provide thermal isolation where components penetrate or disrupt building insulation.
- G. Install sill flashings. Turn up ends and edges; seal to adjacent work to form water tight dam.
- H. Coordinate attachment and seal of perimeter air and vapor barrier materials.
- I. Transition System: Install in accordance with manufacturer's instructions.
  1. Seal to water resistant membrane and aluminum window system.
  2. Use premolded corners where possible.
- J. Pack fibrous insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.
- K. Install perimeter sealant in accordance with Section 07 90 05.
- L. Touch-up minor damage to factory applied finish; replace components that cannot be satisfactorily repaired.
- M. Install 2 x 2 inch aluminum cripples at glazed corners.

### 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 ADJUSTING**

- A. Adjust operating sash for smooth operation.

**3.05 CLEANING**

- A. Remove protective material from pre-finished aluminum surfaces.
- B. Wash down surfaces with a solution of mild detergent in warm water, applied with soft, clean wiping cloths. Take care to remove dirt from corners. Wipe surfaces clean.

**3.06 PROTECTION**

- A. Protect installed products from damage during subsequent construction.

**END OF SECTION**

## UNIT SKYLIGHTS

### PART 1 GENERAL

#### 1.01 SECTION INCLUDES

- A. Preformed glazed skylights with integral metal frame.
- B. Integral insulated curb.

#### 1.02 RELATED REQUIREMENTS

- A. Section 06 10 00 - Rough Carpentry: Wood framing for rough opening.
- B. Section 07 54 00 - Thermoplastic Membrane Roofing.
- C. Section 07 62 00 - Sheet Metal Flashing and Trim: Skylight counterflashing.
- D. Section 08 62 23 - Tubular Skylights.

#### 1.03 REFERENCE STANDARDS

- A. AAMA/WDMA/CSA 101/I.S.2/A440 - North American Fenestration Standard/Specification for windows, doors, and skylights; American Architectural Manufacturers Association/Window and Door Manufacturers Association/Canadian Standards Association; 2011.
- B. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2010.
- C. ASTM B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate [Metric]; 2010.
- D. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2013.
- E. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes [Metric]; 2013.

#### 1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide structural, thermal, and daylighting performance values.
- C. Performance Validation: Provide specified performance validation before submitting shop drawings or starting fabrication.
- D. Shop Drawings: Indicate configurations, dimensions, locations, fastening methods, and installation details.
- E. Manufacturer's Installation Instructions: Indicate special procedures.

#### 1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum five years documented experience.

#### 1.06 WARRANTY

- A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.
- B. Provide five year manufacturer warranty, including coverage for leakage due to defective skylight materials or construction.

### PART 2 PRODUCTS

#### 2.01 MANUFACTURERS

- A. Unit Skylights:

1. Bristolite Daylighting Systems, Inc; Nano Insulgel Super Insulating Silica Aerogel Model ALIT: [www.bristolite.com](http://www.bristolite.com).
2. Wasco Products, Inc; Product Model CAP-LA-5252 Thermal Deck Mount Skylight: [www.wascoproducts.com](http://www.wascoproducts.com).
3. Substitutions: See Section 01 60 00 - Product Requirements.

## 2.02 UNIT SKYLIGHTS

- A. Unit Skylights: Factory-assembled glazing in aluminum frame, free of visual distortion, weathertight.
  1. Shape: Square dome.
  2. Glazing: Double.
  3. Operation: None; fixed.
  4. Nominal Size: 48 x 48 inches.
- B. Performance Requirements:
  1. Comply with AAMA/WDMA/CSA 101/I.S.2/A440 requirements in accordance with the following:
    - a. Performance Grade (PG): 100, with minimum design pressure (DP) of 100.25 psf.
  2. Performance Validation: Skylights shall comply with AAMA/WDMA/CSA 101/I.S.2/A440 performance requirements as indicated by having AAMA, WDMA, or CSA certified label, or an independent test report for indicated products itemizing compliance and acceptable by authorities having jurisdiction.
  3. Allow for expansion and contraction within system components caused by a cycling surface temperature range of 170 degrees F without causing detrimental effects to system or components.
  4. Thermal Performance:
    - a. Maximum U-Value: 0.25.
    - b. Solar Heat Gain Coefficient: 0.57
  5. Light Transmission: 48 percent, minimum.

## 2.03 COMPONENTS

- A. Double Glazing: Polycarbonate plastic with aerogel insulation between layers; factory sealed.
  1. Outer Glazing: Clear transparent.
  2. Inner Glazing: Light diffusing.
- B. Frames: ASTM B221 (ASTM B221M) Extruded aluminum thermally broken, reinforced and welded corner joints, integral curb frame mounting flange and counterflashing to receive roofing flashing system, with integral condensation collection gutter, glazing retainer; clear anodized finish.
- C. Support Curbs: ASTM B209 (ASTM B209M) Sheet aluminum, sandwich construction; 1 inch thick, 12 inches high; rigid plastic insulation; with integral flange for anchorage to roof deck.

## 2.04 ACCESSORIES

- A. Anchorage Devices: Type recommended by manufacturer, concealed.
- B. Counterflashings: Same metal type and finish as skylight frame.

## PART 3 EXECUTION

### 3.01 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Verify that openings and substrate conditions are ready to receive work of this section.

### 3.02 INSTALLATION

- A. Install aluminum curb assembly, fastening securely to roof decking. Flash curb assembly into roof system.

- B. Place skylight units and secure to curb assembly. Install counterflashing as required.
- C. Apply sealant to achieve watertight assembly.

**3.03 CLEANING**

- A. Remove protective material from prefinished aluminum surfaces.
- B. Wash down exposed surfaces; wipe surfaces clean.
- C. Remove excess sealant.

**END OF SECTION**

**DOOR HARDWARE****PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Hardware for wood, hollow steel, and aluminum doors.
- B. Hardware for fire-rated doors.
- C. Electrically operated and controlled hardware.
- D. Lock cylinders for doors for which hardware is specified in other sections.
- E. Thresholds.
- F. Weatherstripping, seals and door gaskets.
- G. Gate locks.

**1.02 RELATED REQUIREMENTS**

- A. Section 08 11 13 - Hollow Metal Doors and Frames.
- B. Section 08 14 16 - Flush Wood Doors.
- C. Section 08 32 00 - Sliding Glass Doors: Hardware for same, except cylinders; installation of cylinders.
- D. Section 08 33 13 - Coiling Counter Shutters: Lockable shutters.
- E. Section 08 33 23 - Overhead Coiling Doors: Lockable coiling doors.
- F. Section 08 33 26 - Overhead Coiling Grilles: Lockable coiling grilles.
- G. Section 08 33 28 - Overhead Coiling Grilles / Deployable Exit Doors: Lockable grilles and doors.
- H. Section 08 33 36 - Side folding Grilles: Lockable side folding grilles.
- I. Section 08 36 13 - Sectional Doors: Hardware for same, except cylinders; installation of cylinders.
- J. Section 08 42 29 - Automatic Entrances: Hardware for same except cylinders; installation of cylinders.
- K. Section 08 71 01 - Door Hardware Schedule
- L. Section 08 43 13 - Aluminum-Framed Storefronts: Aluminum doors.
- M. Section 26 05 00 - Common Work Results for Electrical: Electrical connections.
- N. Division 28 - Electronic Safety and Security: Access control system.

**1.03 REFERENCE STANDARDS**

- A. 36 CFR 1191 - Americans with Disabilities Act (ADA) Accessibility Guidelines for Buildings and Facilities; Architectural Barriers Act (ABA) Accessibility Guidelines; current edition.
- B. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design; 2010.
- C. DHI (LOCS) - Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames; Door and Hardware Institute; 2004.
- D. DHI WDHS.3 - Recommended Locations for Architectural Hardware for Flush Wood Doors; Door and Hardware Institute; 1993; also in WDHS-1/WDHS-5 Series, 1996.
- E. ICC A117.1 - Accessible and Usable Buildings and Facilities; International Code Council; 2009 (ANSI).
- F. NFPA 80 - Standard for Fire Doors and Other Opening Protectives; 2013.

- G. UL (BMD) - Building Materials Directory; Underwriters Laboratories Inc.; current edition.

#### **1.04 ADMINISTRATIVE REQUIREMENTS**

- A. Coordinate the manufacture, fabrication, and installation of products onto which door hardware will be installed.

#### **1.05 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings:
  1. Indicate locations and mounting heights of each type of hardware, schedules, catalog cuts, electrical characteristics and connection requirements .
- C. Hardware Schedule: Detailed listing of each item of hardware to be installed on each door. Use door numbering scheme as included in the Contract Documents. Identify electrically operated items and include power requirements.
- D. Keying Schedule: Submit for approval of Owner.
- E. Manufacturer's Installation Instructions: Indicate special procedures, perimeter conditions requiring special attention.
- F. Project Record Documents: Record actual locations of concealed equipment, services, and conduit.
- G. Maintenance Data: Include data on operating hardware, lubrication requirements, and inspection procedures related to preventative maintenance.
- H. Keys: Deliver with identifying tags to Owner by security shipment direct from hardware supplier.
- I. Warranty: Submit manufacturer's warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

#### **1.06 QUALITY ASSURANCE**

- A. Standards for Fire-Rated Doors: Maintain one copy of each referenced standard on site, for use by Architect and Contractor.
- B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years of documented experience.
- C. Hardware Supplier Qualifications: Company specializing in supplying commercial door hardware with five years of experience.
- D. Hardware Supplier Personnel: Employ an Architectural Hardware Consultant (AHC) to assist in the work of this section.

#### **1.07 DELIVERY, STORAGE, AND HANDLING**

- A. Package hardware items individually; label and identify each package with door opening code to match hardware schedule.

#### **1.08 COORDINATION**

- A. Coordinate the work with other directly affected sections involving manufacture or fabrication of internal reinforcement for door hardware.
- B. Sequence installation to ensure utility connections are achieved in an orderly and expeditious manner.
- C. Coordinate Owner's keying requirements during the course of the Work.

**1.09 WARRANTY**

- A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.
- B. Provide five year warranty for door closers.

**1.10 MAINTENANCE PRODUCTS**

- A. Provide special wrenches and tools applicable to each different or special hardware component.
- B. Provide maintenance tools and accessories supplied by hardware component manufacturer.

**1.11 EXTRA MATERIALS**

- A. Provide ten extra key lock cylinders for each keyed group.

**PART 2 PRODUCTS****2.01 DOOR HARDWARE - GENERAL**

- A. Provide all hardware specified or required to make doors fully functional, compliant with applicable codes, and secure to the extent indicated.
- B. Provide all items of a single type of the same model by the same manufacturer.
- C. Provide products that comply with the following:
  - 1. Applicable provisions of federal, state, and local codes.
  - 2. Accessibility: ADA Standards and ICC A117.1.
  - 3. Fire-Rated Doors: NFPA 80.
  - 4. All Hardware on Fire-Rated Doors : Listed and classified by UL as suitable for the purpose specified and indicated.
  - 5. Hardware for Smoke and Draft Control Doors : Provide hardware that enables door assembly to comply with air leakage requirements of the applicable code.
  - 6. Products Requiring Electrical Connection: Listed and classified by UL as suitable for the purpose specified and indicated.
- D. Function: Lock and latch function numbers and descriptions of manufactures series as scheduled.
- E. Electrically Operated and/or Controlled Hardware: Provide all power supplies, power transfer hinges, relays, and interfaces required for proper operation; provide wiring between hardware and control components and to building power connection.
- F. Finishes: Identified in schedule.
- G. Fasteners:
  - 1. Mineral Core Wood Doors: Sex bolts.
  - 2. Closers at Wood Doors: Sex bolts.
  - 3. Concrete and Masonry Substrates: Stainless steel machine screws and lead expansion shields.

**2.02 GENERAL REQUIREMENTS FOR DOOR HARDWARE PRODUCTS**

- A. Provide products that comply with the following:
  - 1. Applicable provisions of Oregon Structural Specialty Code.
  - 2. ANSI/ICC A117.1, American National Standard for Accessible and Usable Buildings and Facilities.
  - 3. All Hardware on Fire-Rated Doors: Listed and classified by UL as suitable for the purpose specified and indicated.
  - 4. Hardware for Smoke and Draft Control Doors: Provide hardware that enables door assembly to comply with air leakage requirements of the applicable code.
  - 5. Products Requiring Electrical Connection: Listed and classified by UL as suitable for the purpose specified and indicated.

- B. Finishes: Identified in schedule at end of section.

### **2.03 KEYING**

- A. Door Locks: Grand master keyed.
  1. Include construction keying.
- B. Supply keys in the following quantities:
  1. 2 change keys for each lock.
  2. Construction keys as required by Contractor.

### **2.04 KEY CABINET**

- A. Cabinet Construction: Sheet steel construction, piano hinged door with cylinder type lock master keyed to building system.
- B. Cabinet Size: Size for project keys plus 10 percent growth.
- C. Horizontal metal strips for key hook labelling with clear plastic strip cover over labels.
- D. Finish: Baked enamel, color as selected.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify that doors and frames are ready to receive work; labeled, fire-rated doors and frames are present and properly installed, and dimensions are as indicated on shop drawings.
- B. Verify that electric power is available to power operated devices and of the correct characteristics.

### **3.02 INSTALLATION**

- A. Install hardware in accordance with manufacturer's instructions and applicable codes.
- B. Use templates provided by hardware item manufacturer.
- C. Install hardware on fire-rated doors and frames in accordance with code and NFPA 80.
- D. Mounting heights for hardware from finished floor to center line of hardware item:
  1. For steel doors and frames: Comply with DHI "Recommended Locations for Architectural Hardware for Steel Doors and Frames."
  2. For wood doors: Comply with DHI "Recommended Locations for Architectural Hardware for Wood Flush Doors."

### **3.03 FIELD QUALITY CONTROL**

- A. Provide an Architectural Hardware Consultant to inspect installation and certify that hardware and installation has been furnished and installed in accordance with manufacturer's instructions and as specified.

### **3.04 ADJUSTING**

- A. Adjust work under provisions of Section 01 70 00.
- B. Adjust hardware for smooth operation.

### **3.05 PROTECTION**

- A. Protect finished Work under provisions of Section 01 70 00.
- B. Do not permit adjacent work to damage hardware or finish.



**3.06 SCHEDULE - SEE SECTION 08 71 01 - DOOR HARDWARE SCHEDULE**

**END OF SECTION**

## DOOR HARDWARE SCHEDULE

**HW SET: 01**

DOOR NUMBER:

<b>101A</b>	<b>101B</b>	<b>128C</b>	<b>136A-A</b>	<b>150A</b>	<b>150A-2</b>
<b>150A.1</b>	<b>150B.1</b>	<b>150B.2</b>	<b>151A</b>	<b>151B</b>	<b>153A</b>
<b>155A</b>	<b>165G</b>	<b>165H</b>	<b>173C</b>	<b>180B</b>	<b>180C</b>
<b>180D</b>	<b>180E</b>	<b>180F</b>	<b>180G</b>	<b>180H</b>	<b>194A</b>
<b>194A-A</b>	<b>211A.1</b>	<b>211A.2</b>	<b>211A.3</b>	<b>M281B-B</b>	

EACH TO HAVE:

<u>Qty</u>	<u>Description</u>	<u>Catalog Number</u>	<u>Finish</u>	<u>Mfr</u>
		HARDWARE BY DOOR MANUFACTURER		

**NOTE: ADVISE OF ANY CYLINDER REQUIREMENTS (QUANTITY, TYPE, LENGTH, AND CAM TYPE).**

**HW SET: 02**

DOOR NUMBER:

**101C**

EACH TO HAVE:

<u>Qty</u>	<u>Description</u>	<u>Catalog Number</u>	<u>Finish</u>	<u>Mfr</u>
<b>3</b>	<b>EA</b>	<b>HINGE</b>	<b>652</b>	<b>IVE</b>
<b>1</b>	<b>EA</b>	<b>POWER TRANSFER</b>	<b>689</b>	<b>VON</b>
<b>1</b>	<b>EA</b>	<b>VANDL FAILS SECURE ELECTRIFIED LOCKSET</b>	<b>626</b>	<b>SCH</b>
<b>1</b>	<b>EA</b>	<b>SURFACE CLOSER</b>	<b>689</b>	<b>LCN</b>
<b>1</b>	<b>EA</b>	<b>CUSH SHOE SUPPORT</b>	<b>689</b>	<b>LCN</b>
<b>1</b>	<b>EA</b>	<b>BLADE STOP SPACER</b>	<b>689</b>	<b>LCN</b>
<b>1</b>	<b>EA</b>	<b>THRESHOLD</b>	<b>AL</b>	<b>NGP</b>
<b>1</b>	<b>EA</b>	<b>DOOR CONTACT</b>	<b>BLK</b>	<b>SCE</b>
		ACCESS CONTROL - WORK OF DIVISION 28 PERIMETER SEALS BY DOOR SUPPLIER POWER SUPPLY - WORK OF DIVISION 28		

**HW SET: 03**

DOOR NUMBER:

**209A**

EACH TO HAVE:

<u>Qty</u>	<u>Description</u>	<u>Catalog Number</u>	<u>Finish</u>	<u>Mfr</u>
<b>3</b>	<b>EA</b>	<b>HINGE</b>	<b>652</b>	<b>IVE</b>
<b>1</b>	<b>EA</b>	<b>VANDL VESTIBULE LOCK</b>	<b>626</b>	<b>SCH</b>
<b>1</b>	<b>EA</b>	<b>SURFACE CLOSER</b>	<b>689</b>	<b>LCN</b>
<b>3</b>	<b>EA</b>	<b>SILENCER</b>	<b>GRY</b>	<b>IVE</b>

**HW SET: 04**

DOOR NUMBER:

**103A-B**

EACH TO HAVE:

<u>Qty</u>		<u>Description</u>	<u>Catalog Number</u>	<u>Finish</u>	<u>Mfr</u>
3	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	ENTRANCE LOCK	ND53PD RHO	626	SCH
1	EA	WALL STOP	WS406/407CCV	630	IVE
3	EA	SILENCER	SR64	GRY	IVE

**HW SET: 05**

DOOR NUMBER:

**103A-A      115A                  116A                  126A                  140A                  141A**  
**157A                  172A                  206A                  208A                  222A**

EACH TO HAVE:

<u>Qty</u>		<u>Description</u>	<u>Catalog Number</u>	<u>Finish</u>	<u>Mfr</u>
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	VANDL STOREROOM LOCK	ND96PD RHO	626	SCH
1	EA	KICK PLATE	8400 10" X 2" LDW B4E	630	IVE
1	EA	WALL STOP	WS406/407CCV	630	IVE

**HW SET: 06**

DOOR NUMBER:

**104A                  106A                  108A                  111A                  112A                  113A**  
**114A                  159A                  160A                  178A**

EACH TO HAVE:

<u>Qty</u>		<u>Description</u>	<u>Catalog Number</u>	<u>Finish</u>	<u>Mfr</u>
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	ENTRANCE LOCK	ND53PD RHO	626	SCH
1	EA	WALL STOP	WS406/407CCV	630	IVE
1	SET	SEALS	5050B (HEAD & JAMBS)	BRN	NGP

**HW SET: 07**

DOOR NUMBER:

**119B                  129A-B                  131B                  131C                  133B-A                  133B-B**  
**M291A**

EACH TO HAVE:

<u>Qty</u>		<u>Description</u>	<u>Catalog Number</u>	<u>Finish</u>	<u>Mfr</u>
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	PASSAGE SET	ND10S RHO	626	SCH
1	EA	WALL STOP	WS406/407CCV	630	IVE
3	EA	SILENCER	SR64	GRY	IVE

**HW SET: 08**

DOOR NUMBER:

107A                      110A                      117A                      123B-A                      158A                      175A

EACH TO HAVE:

<u>Qty</u>		<u>Description</u>	<u>Catalog Number</u>	<u>Finish</u>	<u>Mfr</u>
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	VANDL STOREROOM LOCK	ND96PD RHO	626	SCH
1	EA	WALL STOP	WS406/407CCV	630	IVE
3	EA	SILENCER	SR64	GRY	IVE

**HW SET: 09**

DOOR NUMBER:

177A

EACH TO HAVE:

<u>Qty</u>		<u>Description</u>	<u>Catalog Number</u>	<u>Finish</u>	<u>Mfr</u>
3	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	VANDL STOREROOM LOCK	ND96PD RHO	626	SCH
1	EA	SURFACE CLOSER	4111 EDA WMS	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B4E	630	IVE
1	EA	WALL STOP	WS406/407CCV	630	IVE
3	EA	SILENCER	SR64	GRY	IVE

**HW SET: 10**

DOOR NUMBER:

118B

EACH TO HAVE:

<u>Qty</u>		<u>Description</u>	<u>Catalog Number</u>	<u>Finish</u>	<u>Mfr</u>
3	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	VANDL VESTIBULE LOCK	ND93PD RHO	626	SCH
1	EA	SURFACE CLOSER	4011 WMS	689	LCN
1	EA	WALL STOP	WS406/407CCV	630	IVE
3	EA	SILENCER	SR64	GRY	IVE

**HW SET: 11**

DOOR NUMBER:

121A                      129A-A                      131A                      133A-A                      137A                      192A  
192B                      196A                      196B                      202B-A                      204A

EACH TO HAVE:

<u>Qty</u>		<u>Description</u>	<u>Catalog Number</u>	<u>Finish</u>	<u>Mfr</u>
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	VANDL VESTIBULE LOCK	ND93PD RHO	626	SCH
1	EA	WALL STOP	WS406/407CCV	630	IVE
3	EA	SILENCER	SR64	GRY	IVE

**HW SET: 12**

DOOR NUMBER:

**123A-A**

EACH TO HAVE:

<u>Qty</u>		<u>Description</u>	<u>Catalog Number</u>	<u>Finish</u>	<u>Mfr</u>
1	EA	CONT. HINGE	112HD	628	IVE
1	EA	PANIC HARDWARE	98-NL-1439	626	VON
1	EA	RIM CYLINDER	20-057-ICX	626	SCH
1	EA	FSIC CORE	23-030	626	SCH
1	EA	ELECTRIC STRIKE	6300 FSE	630	VON
1	EA	SURF. AUTO OPERATOR	9542 MS	ANCLR	LCN
2	EA	ACTUATOR, WALL MOUNT	8310-853T	630	LCN
2	EA	FLUSH MOUNT BOX	8310-867F	689	LCN
1	EA	WALL STOP	WS406/407CCV	630	IVE
			PERIMETER SEALS BY DOOR SUPPLIER		

**NOTE: 120VAC TO DOOR OPERATOR. CONNECT FIRE ALARM TO AUTO OPERATOR. OPERATOR TO BECOME INOPERATIVE ON FIRE ALARM ACTIVATION.**

**HW SET: 13**

DOOR NUMBER:

**123A-B**

EACH TO HAVE:

<u>Qty</u>		<u>Description</u>	<u>Catalog Number</u>	<u>Finish</u>	<u>Mfr</u>
1	EA	CONT. HINGE	112HD	628	IVE
1	EA	PANIC HARDWARE	LD-98-NL	626	VON
1	EA	ELECTRIC STRIKE	9600 12/24VAC FSE	630	HES
1	EA	OH STOP	100S ADJ	630	GLY
1	EA	SURF. AUTO OPERATOR	9542 MS	ANCLR	LCN
1	EA	WEATHER RING	8310-801	PLA	LCN
2	EA	ACTUATOR, WALL MOUNT	8310-853T	630	LCN
2	EA	FLUSH MOUNT BOX	8310-867F	689	LCN
1	EA	DRIP CAP	16A (OMIT IF OPENING IS PROTECTED)	CL	NGP
1	EA	DOOR SWEEP	C627A	CL	NGP
1	EA	THRESHOLD	659 MS/LA	AL	NGP
1	EA	DOOR CONTACT	679-05HM	BLK	SCE
1	EA	MOTION SENSOR	SCANII	WHT	SCE
			ACCESS CONTROL - WORK OF DIVISION 28		
			POWER SUPPLY - WORK OF DIVISION 28		
			WEATHERSTRIP BY DOOR/FRAME MANUFACTURER		

**NOTE: 120VAC TO DOOR OPERATOR. CONNECT FIRE ALARM TO AUTO OPERATOR. OPERATOR TO BECOME INOPERATIVE ON FIRE ALARM ACTIVATION.**

**HW SET: 14**

DOOR NUMBER:  
123C-A

EACH TO HAVE:

<u>Qty</u>		<u>Description</u>	<u>Catalog Number</u>	<u>Finish</u>	<u>Mfr</u>
3	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	VANDL STOREROOM LOCK	ND96PD RHO	626	SCH
1	EA	SURFACE CLOSER	4111 EDA WMS	689	LCN
1	EA	WALL STOP	WS406/407CCV	630	IVE
1	SET	SEALS	5050B (HEAD & JAMBS)	BRN	NGP

**HW SET: 15**

DOOR NUMBER:  
125A

EACH TO HAVE:

<u>Qty</u>		<u>Description</u>	<u>Catalog Number</u>	<u>Finish</u>	<u>Mfr</u>
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	PRIVACY LOCK WITH OCCUPIED INDICATOR	L9456P 06A L583-363 L283-722	626	SCH
1	EA	SURFACE CLOSER	4111 CUSH WMS	689	LCN
1	SET	SEALS	5050B (HEAD & JAMBS)	BRN	NGP

**HW SET: 16**

DOOR NUMBER:

129A	129B	133A	133B	135A	143A
145A	193B	195B	197B	213A	215A
217A	225A	227A			

EACH TO HAVE:

<u>Qty</u>		<u>Description</u>	<u>Catalog Number</u>	<u>Finish</u>	<u>Mfr</u>
3	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	VANDL VESTIBULE LOCK	ND93PD RHO	626	SCH
1	EA	WALL STOP	WS406/407CCV	630	IVE
3	EA	SILENCER	SR64	GRY	IVE

**HW SET: 17**

DOOR NUMBER:

130A	134A	142A	146A	212A	216A
224A	228A				

EACH TO HAVE:

<u>Qty</u>		<u>Description</u>	<u>Catalog Number</u>	<u>Finish</u>	<u>Mfr</u>
3	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	VANDL VESTIBULE LOCK	ND93PD RHO	626	SCH
1	EA	OH STOP	90S	630	GLY

DOOR HARDWARE SCHEDULE – 08 71 01

**3 EA SILENCER SR64 GRY IVE**  
**HW SET: 18**  
 DOOR NUMBER:  
**132A 144A**

EACH TO HAVE:

<u>Qty</u>		<u>Description</u>	<u>Catalog Number</u>	<u>Finish</u>	<u>Mfr</u>
1	EA	CONT. HINGE	112HD	628	IVE
1	EA	CONT. HINGE	112HD EPT	628	IVE
1	EA	POWER TRANSFER	EPT10 CON	689	VON
1	EA	ELEC PANIC HARDWARE	RX-ALK-98-NL-AR3-CON	626	VON
1	EA	RIM CYLINDER	20-057-ICX	626	SCH
1	EA	MORTISE CYLINDER	20-061-ICX	626	SCH
2	EA	FSIC CORE	23-030	626	SCH
1	EA	ELECTRIC STRIKE	9600 12/24VAC FSE	630	HES
1	EA	SURFACE CLOSER	4111 EDA WMS	689	LCN
1	EA	BLADE STOP SPACER	4110-61	689	LCN
1	EA	WALL STOP	WS406/407CCV	630	IVE
1	EA	DRIP CAP	16A (OMIT IF OPENING IS PROTECTED)	CL	NGP
1	EA	DOOR SWEEP	C627A	CL	NGP
1	EA	THRESHOLD	659 MS/LA	AL	NGP
1	EA	DOOR CONTACT	679-05HM	BLK	SCE
1	EA	POWER SUPPLY	PS902 900-BBK KL900	LGR	SCE
ACCESS CONTROL - WORK OF DIVISION 28 WEATHERSTRIP BY DOOR/FRAME MANUFACTURER					

**NOTE: CARD READER BOTH SIDES. EGRESS SIDE ALWAYS FREE FOR EXITING. BYPASSING CARD READER ON EGRESS SIDE SOUNDS AUDIBLE ALARM AT DOOR.**

**HW SET: 19**  
 DOOR NUMBER:  
**167B**

EACH TO HAVE:

<u>Qty</u>		<u>Description</u>	<u>Catalog Number</u>	<u>Finish</u>	<u>Mfr</u>
1	EA	CONT. HINGE	112HD	628	IVE
1	EA	CONT. HINGE	112HD EPT	628	IVE
1	EA	POWER TRANSFER	EPT10 CON	689	VON
1	EA	KEYED REMOVABLE MULLION	KR4954-STAB	689	VON
1	EA	ELEC PANIC HARDWARE	EL-98-NL-CON	626	VON
1	EA	PANIC HARDWARE	LD-98-EO	626	VON
1	EA	RIM CYLINDER	20-057-ICX	626	SCH
1	EA	MORTISE CYLINDER	20-061-ICX	626	SCH
2	EA	FSIC CORE	23-030	626	SCH
2	EA	SURFACE CLOSER	4111 SCUSH WMS	689	LCN
2	EA	CUSH SHOE SUPPORT	4110-30	689	LCN
2	EA	BLADE STOP SPACER	4110-61	689	LCN
1	EA	DRIP CAP	16A (OMIT IF OPENING IS PROTECTED)	CL	NGP
1	EA	MULLION SEAL	5100	BLK	NGP
2	EA	DOOR SWEEP	C627A	CL	NGP
1	EA	THRESHOLD	659 MS/LA	AL	NGP
2	EA	DOOR CONTACT	679-05HM	BLK	SCE
1	EA	MOTION SENSOR	SCANII	WHT	SCE

1 EA POWER SUPPLY PS914 900-BBK KL900 LGR VON  
 WEATHERSTRIP BY DOOR/FRAME  
 MANUFACTURER

NOTE: 120VAC TO POWER SUPPLY. RUN 12 GA WIRE (HOME RUN 0-200 LINEAL FEET) TO EL DEVICE.

**HW SET: 20** - Not Used

**HW SET: 21**

DOOR NUMBER:  
 138A

EACH TO HAVE:

<u>Qty</u>		<u>Description</u>	<u>Catalog Number</u>	<u>Finish</u>	<u>Mfr</u>
3	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	VANDL STOREROOM LOCK	ND96PD RHO	626	SCH
1	EA	OH STOP	90S	630	GLY
1	EA	KICK PLATE	8400 10" X 2" LDW B4E	630	IVE
3	EA	SILENCER	SR64	GRY	IVE

**HW SET: 22** - Not Used

**HW SET: 23**

DOOR NUMBER:  
 151C                      153B                      153C                      155B

EACH TO HAVE:

<u>Qty</u>		<u>Description</u>	<u>Catalog Number</u>	<u>Finish</u>	<u>Mfr</u>
1	EA	CONT. HINGE	112HD	628	IVE
1	EA	VANDL VESTIBULE LOCK	ND93PD RHO	626	SCH
1	EA	OH STOP	100S ADJ	630	GLY
			PERIMETER SEALS BY DOOR SUPPLIER		

**HW SET: 24**

DOOR NUMBER:  
 129B-A

EACH TO HAVE:

<u>Qty</u>		<u>Description</u>	<u>Catalog Number</u>	<u>Finish</u>	<u>Mfr</u>
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	VANDL STOREROOM LOCK	ND96PD RHO	626	SCH
1	EA	OH STOP	100S ADJ	630	GLY
3	EA	SILENCER	SR64	GRY	IVE



**HW SET: 25**

DOOR NUMBER:

152A                      152B                      152C                      154A                      154B                      154C

EACH TO HAVE:

<u>Qty</u>		<u>Description</u>	<u>Catalog Number</u>	<u>Finish</u>	<u>Mfr</u>
1	EA	TRACK ASSEMBLY (UP TO 450 LB DOOR)	C-205-4	CL	KNC
2	EA	FLUSH PULL (FOR USE WITH CYLINDERS)	S2002C	630	ACC
2	EA	FLUSH PULL (THUMB TURN)	S2002T	630	ACC
2	EA	SLIDING DOOR LOCK	2001 SDL-3	626	ACC
1	EA	MORTISE CYLINDER	20-059-ICX	626	SCH
1	EA	FSIC CORE	23-030	626	SCH

**HW SET: 26**

DOOR NUMBER:

156A

EACH TO HAVE:

<u>Qty</u>		<u>Description</u>	<u>Catalog Number</u>	<u>Finish</u>	<u>Mfr</u>
6	EA	HW HINGE	5BB1HW 4.5 X 4.5	652	IVE
2	EA	PUSH PLATE	8200 4" X 16"	630	IVE
2	EA	PULL PLATE	8302 6" 4" X 16" G	630	IVE
2	EA	SURFACE CLOSER	4111 EDA WMS	689	LCN
2	EA	WALL STOP	WS406/407CCV	630	IVE
2	EA	SILENCER	SR64	GRY	IVE

**HW SET: 28**

DOOR NUMBER:

161A                      162A                      163A                      164A

EACH TO HAVE:

<u>Qty</u>		<u>Description</u>	<u>Catalog Number</u>	<u>Finish</u>	<u>Mfr</u>
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	CLASSROOM DEADBOLT	B663P	626	SCH
1	EA	PUSH PLATE	8200 4" X 16" CFT	630	IVE
1	EA	PULL PLATE	8302 6" 4" X 16" CFC G	630	IVE
1	EA	SURFACE CLOSER	4111 EDA WMS	689	LCN
1	EA	WALL STOP	WS406/407CCV	630	IVE
3	EA	SILENCER	SR64	GRY	IVE

**NOTE: CLASSROOM DEADLOCK - DEADBOLT THROWN OR RETRACTED BY KEY OUTSIDE. INSIDE THUMB TURN RETRACTS DEADBOLT BUT CANNOT PROJECT IT.**

**HW SET: 29**

DOOR NUMBER:

**165A                    166A**

EACH TO HAVE:

<u>Qty</u>		<u>Description</u>	<u>Catalog Number</u>	<u>Finish</u>	<u>Mfr</u>
6	EA	HW HINGE	5BB1HW 4.5 X 4.5 NRP	652	IVE
1	EA	KEYED REMOVABLE MULLION	KR4954-STAB	689	VON
1	EA	PANIC HARDWARE	98-EO	626	VON
1	EA	PANIC HARDWARE	98-NL	626	VON
1	EA	RIM CYLINDER	20-057-ICX	626	SCH
1	EA	MORTISE CYLINDER	20-061-ICX	626	SCH
2	EA	FSIC CORE	23-030	626	SCH
2	EA	SURFACE CLOSER	4111 EDA WMS	689	LCN
2	EA	KICK PLATE	8400 10" X 2" LDW B4E	630	IVE
2	EA	WALL STOP	WS406/407CCV	630	IVE
2	EA	SILENCER	SR64	GRY	IVE

**HW SET: 30**

DOOR NUMBER:

**166A-A**

EACH TO HAVE:

<u>Qty</u>		<u>Description</u>	<u>Catalog Number</u>	<u>Finish</u>	<u>Mfr</u>
6	EA	HW HINGE	5BB1HW 4.5 X 4.5 NRP	652	IVE
1	EA	KEYED REMOVABLE MULLION	KR4954-STAB	689	VON
1	EA	PANIC HARDWARE	98-EO	626	VON
1	EA	PANIC HARDWARE	98-NL	626	VON
1	EA	RIM CYLINDER	20-057-ICX	626	SCH
1	EA	MORTISE CYLINDER	20-061-ICX	626	SCH
2	EA	FSIC CORE	23-030	626	SCH
1	EA	SURFACE CLOSER	4111 EDA WMS	689	LCN
1	EA	SURFACE CLOSER	4111 SCUSH WMS	689	LCN
1	EA	WALL STOP	WS406/407CCV	630	IVE
2	EA	SILENCER	SR64	GRY	IVE

**HW SET: 31**

DOOR NUMBER:

**165B                    166F**

EACH TO HAVE:

<u>Qty</u>		<u>Description</u>	<u>Catalog Number</u>	<u>Finish</u>	<u>Mfr</u>
3	EA	HW HINGE	5BB1HW 4.5 X 4.5 NRP	652	IVE
1	EA	PANIC HARDWARE	98-NL	626	VON
1	EA	RIM CYLINDER	20-057-ICX	626	SCH
1	EA	FSIC CORE	23-030	626	SCH
1	EA	SURFACE CLOSER	4111 SCUSH WMS	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B4E	630	IVE
3	EA	SILENCER	SR64	GRY	IVE

**HW SET: 32**

DOOR NUMBER:

165B-A                      166B                      166B-A

EACH TO HAVE:

<u>Qty</u>		<u>Description</u>	<u>Catalog Number</u>	<u>Finish</u>	<u>Mfr</u>
6	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	MANUAL FLUSH BOLT	FB358	626	IVE
			(BOTTOM BOLT)		
1	EA	AUTO FLUSH BOLT	FB41T	630	IVE
			(TOP BOLT)		
1	EA	DUST PROOF STRIKE	DP2	626	IVE
1	EA	CLASSROOM DEADBOLT	B663P	626	SCH
1	EA	ADA FLUSH PULL	1111C	630	TRI
			(ACTIVE LEAF)		
2	EA	OH STOP	90S	630	GLY
2	EA	ARMOR PLATE	8400 36" X 1" LDW B4E	630	IVE
1	EA	ASTRAGAL	158SA	CL	NGP
2	EA	SILENCER	SR64	GRY	IVE

NOTE: CLASSROOM DEADLOCK - DEADBOLT THROWN OR RETRACTED BY KEY OUTSIDE.  
INSIDE THUMB TURN RETRACTS DEADBOLT BUT CANNOT PROJECT IT.

**HW SET: 33**

DOOR NUMBER:

165C-A                      166C                      166C-A

EACH TO HAVE:

<u>Qty</u>		<u>Description</u>	<u>Catalog Number</u>	<u>Finish</u>	<u>Mfr</u>
3	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	CLASSROOM DEADBOLT	B663P	626	SCH
1	EA	ADA FLUSH PULL	1111C	630	TRI
1	EA	OH STOP	90S	630	GLY
1	EA	ARMOR PLATE	8400 36" X 2" LDW B4E	630	IVE
3	EA	SILENCER	SR64	GRY	IVE

NOTE: CLASSROOM DEADLOCK - DEADBOLT THROWN OR RETRACTED BY KEY OUTSIDE.  
INSIDE THUMB TURN RETRACTS DEADBOLT BUT CANNOT PROJECT IT.

**HW SET: 34**

DOOR NUMBER:

165F                      166D

EACH TO HAVE:

<u>Qty</u>		<u>Description</u>	<u>Catalog Number</u>	<u>Finish</u>	<u>Mfr</u>
2	EA	CONT. HINGE	112HD	628	IVE
1	EA	KEYED REMOVABLE MULLION	KR4954-STAB	689	VON
1	EA	PANIC HARDWARE	98-EO	626	VON
1	EA	PANIC HARDWARE	98-NL	626	VON
1	EA	RIM CYLINDER	20-057-ICX	626	SCH
1	EA	MORTISE CYLINDER	20-061-ICX	626	SCH

DOOR HARDWARE SCHEDULE – 08 71 01

2	EA	FSIC CORE	23-030	626	SCH
2	EA	SURFACE CLOSER	4111 SCUSH WMS	689	LCN
2	EA	CUSH SHOE SUPPORT	4110-30	689	LCN
2	EA	BLADE STOP SPACER	4110-61	689	LCN
			PERIMETER SEALS BY DOOR SUPPLIER		

**HW SET: 35**

DOOR NUMBER:

151A-B            151E

EACH TO HAVE:

<u>Qty</u>		<u>Description</u>	<u>Catalog Number</u>	<u>Finish</u>	<u>Mfr</u>
3	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	DBL CYL STORE LOCK	ND66PD RHO (SEE FUNCTION DESCRIPTION BELOW)	626	SCH
1	EA	WALL STOP	WS406/407CCV	630	IVE
1	SET	SEALS	5050B (HEAD & JAMBS)	BRN	NGP

NOTE: ND66 LOCK DESCRIPTION - KEY IN EITHER LEVER LOCKS/UNLOCKS BOTH LEVERS.

**HW SET: 36**

DOOR NUMBER:

167C

EACH TO HAVE:

<u>Qty</u>		<u>Description</u>	<u>Catalog Number</u>	<u>Finish</u>	<u>Mfr</u>
1	EA	CONT. HINGE	112HD	628	IVE
1	EA	CONT. HINGE	112HD EPT	628	IVE
1	EA	POWER TRANSFER	EPT10 CON	689	VON
1	EA	KEYED REMOVABLE MULLION	KR4954-STAB	689	VON
1	EA	ELEC PANIC HARDWARE	EL-98-NL-CON	626	VON
1	EA	PANIC HARDWARE	LD-98-EO	626	VON
1	EA	RIM CYLINDER	20-057-ICX	626	SCH
1	EA	MORTISE CYLINDER	20-061-ICX	626	SCH
2	EA	FSIC CORE	23-030	626	SCH
1	EA	OH STOP	100S ADJ	630	GLY
1	EA	SURFACE CLOSER	4111 SCUSH WMS	689	LCN
1	EA	SURF. AUTO OPERATOR	9542 MS	ANCLR	LCN
1	EA	CUSH SHOE SUPPORT	4110-30	689	LCN
1	EA	BLADE STOP SPACER	4110-61	689	LCN
1	EA	WEATHER RING	8310-801	PLA	LCN
1	EA	ACTUATOR, WALL MOUNT	8310-853T	630	LCN
1	EA	FLUSH MOUNT BOX	8310-867F	689	LCN
1	EA	DRIP CAP	16A (OMIT IF OPENING IS PROTECTED)	CL	NGP
1	EA	MULLION SEAL	5100	BLK	NGP
2	EA	DOOR SWEEP	C627A	CL	NGP
1	EA	THRESHOLD	659 MS/LA	AL	NGP
2	EA	DOOR CONTACT	679-05HM	BLK	SCE

DOOR HARDWARE SCHEDULE – 08 71 01

1	EA	MOTION SENSOR	SCANII	WHT	SCE
1	EA	POWER SUPPLY	PS902 900-BBK KL900	LGR	SCE
			ACCESS CONTROL - WORK OF		
			DIVISION 28		
1			PROVIDE FACTORY POINT TO POINT		
			WIRING DIAGRAMS		
1			PROVIDE RISER DIAGRAMS		
			WEATHERSTRIP BY DOOR/FRAME		
			MANUFACTURER		

**NOTE: 120VAC TO POWER SUPPLY AND ADA OPERATOR. RUN 12 GA WIRE (HOME RUN 0-200 LINEAL FEET) TO EL DEVICES. CONNECT FA CIRCUIT IN POWER SUPPLY TO OPERATOR AND FIRE ALARM. ADA OPERATOR TO BECOME INOPERATIVE DURING FIRE ALARM ACTIVATION.**

**HW SET: 37**

DOOR NUMBER:

169A

EACH TO HAVE:

<u>Qty</u>		<u>Description</u>	<u>Catalog Number</u>	<u>Finish</u>	<u>Mfr</u>
6	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	MANUAL FLUSH BOLT	FB358	626	IVE
			(BOTTOM BOLT)		
1	EA	AUTO FLUSH BOLT	FB41T	630	IVE
			(TOP BOLT)		
1	EA	DUST PROOF STRIKE	DP2	626	IVE
1	EA	VANDL STOREROOM LOCK	ND96PD RHO XQ07-351	626	SCH
2	EA	ARMOR PLATE	8400 36" X 1" LDW B4E	630	IVE
2	EA	WALL STOP	WS406/407CCV	630	IVE
1	EA	ASTRAGAL	158SA	CL	NGP
2	EA	SILENCER	SR64	GRY	IVE

**HW SET: 38**

DOOR NUMBER:

173A

EACH TO HAVE:

<u>Qty</u>		<u>Description</u>	<u>Catalog Number</u>	<u>Finish</u>	<u>Mfr</u>
6	EA	HW HINGE	5BB1HW 4.5 X 4.5 NRP	630	IVE
1	EA	POWER TRANSFER	EPT10 CON	689	VON
1	EA	KEYED REMOVABLE MULLION	KR4954-STAB	689	VON
1	EA	ELEC PANIC HARDWARE	EL-98-NL-CON	626	VON
1	EA	PANIC HARDWARE	LD-98-EO	626	VON
1	EA	RIM CYLINDER	20-057-ICX	626	SCH
1	EA	MORTISE CYLINDER	20-061-ICX	626	SCH
2	EA	FSIC CORE	23-030	626	SCH
2	EA	SURFACE CLOSER	4111 SHCUSH ST-1586 WMS	689	LCN
2	EA	ARMOR PLATE	8400 36" X 2" LDW B4E	630	IVE
1	SET	SEALS	700SA (HEAD & JAMBS)	CL	NGP
1	EA	MULLION SEAL	5100	BLK	NGP
2	EA	DOOR SWEEP	200NA	CL	NGP

DOOR HARDWARE SCHEDULE – 08 71 01

1	EA	HEAVY DUTY THRESHOLD	425HD MS/LA	AL	NGP
2	EA	DOOR CONTACT	679-05HM	BLK	SCE
1	EA	MOTION SENSOR	SCANII	WHT	SCE
1	EA	POWER SUPPLY	PS914 900-BBK KL900 ACCESS CONTROL - WORK OF DIVISION 28 POWER SUPPLY - WORK OF DIVISION 28	LGR	VON

NOTE 1: 120VAC TO POWER SUPPLY. RUN 12 GA WIRE (HOME RUN 0-200 LINEAL FEET) TO EL DEVICE.

NOTE 2: INSTALL PERIMETER SEAL BEFORE CLOSERS. DO NOT NOTCH SEAL. CLOSERS INSTALL ON TOP OF SEAL. ADJUST TEMPLATES ACCORDINGLY.

**HW SET: 39**

DOOR NUMBER:  
173B

EACH TO HAVE:

<u>Qty</u>		<u>Description</u>	<u>Catalog Number</u>	<u>Finish</u>	<u>Mfr</u>
3	EA	HW HINGE	5BB1HW 5 X 4.5 NRP	652	IVE
1	EA	VANDL VESTIBULE LOCK	ND93PD RHO	626	SCH
1	EA	SURFACE CLOSER	4111 EDA WMS	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B4E	630	IVE
1	EA	WALL STOP	WS406/407CCV	630	IVE
3	EA	SILENCER	SR64	GRY	IVE

**HW SET: 40**

DOOR NUMBER:  
173D

EACH TO HAVE:

<u>Qty</u>		<u>Description</u>	<u>Catalog Number</u>	<u>Finish</u>	<u>Mfr</u>
2	EA	PAD LOCK KEEPER	0524PL	Z	CRO
2	EA	CANE BOLT	524	Z	CRO
2	EA	PADLOCK L/CYL-FSIC	KS43F3200	606	SCH
1	EA	FSIC CORE	23-030	626	SCH
1	EA	GATE MAG LOCK	M490G	628	SCE
1	EA	PUSHBUTTON	621GREX DA	629	SCE
1	EA	MOTION SENSOR	SCANII	WHT	SCE
1	EA	POWER SUPPLY	PS902 900-BBK FA900 KL900 ACCESS CONTROL - WORK OF DIVISION 28	LGR	SCE

NOTE: CHAIN LINK GATES. PIVOTS AND HARDWARE MOUNTING PLATES/PREP BY GATE MANUFACTURER. ACCESS CONTROLLED GATE. MOTION SENSOR AND EMERGENCY EGRESS BUTTON REQUIRE PROTECTION FROM WEATHER. COORDINATE MAG LOCK WITH GATE DETAILS. PROVIDE ADDITIONAL MOUNTING BRACKETS AS NECESSARY.

**HW SET: 41**

DOOR NUMBER:

**174A**

EACH TO HAVE:

<u>Qty</u>		<u>Description</u>	<u>Catalog Number</u>	<u>Finish</u>	<u>Mfr</u>
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	VANDL STOREROOM LOCK	ND96PD RHO	626	SCH
1	EA	OH STOP	100S ADJ	630	GLY
1	EA	SURFACE CLOSER	4011 WMS	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B4E	630	IVE
1	SET	SEALS	5050B (HEAD & JAMBS)	BRN	NGP
1	EA	SURFACE AUTOMATIC DOOR BOTTOM	420NA	CL	NGP

**HW SET: 42**

DOOR NUMBER:

**179A****181B-A**

EACH TO HAVE:

<u>Qty</u>		<u>Description</u>	<u>Catalog Number</u>	<u>Finish</u>	<u>Mfr</u>
3	EA	HINGE	5BB1 4.5 X 4.5 NRP	630	IVE
1	EA	PANIC HARDWARE	LD-98-NL	626	VON
1	EA	RIM CYLINDER	20-057-ICX	626	SCH
1	EA	FSIC CORE	23-030	626	SCH
1	EA	ELECTRIC STRIKE	9600 12/24VAC FSE	630	HES
1	EA	SURFACE CLOSER	4111 SHCUSH WMS	689	LCN
1	EA	DRIP CAP	16A (OMIT IF OPENING IS PROTECTED)	CL	NGP
1	SET	SEALS	5050B (HEAD & JAMBS)	BRN	NGP
1	EA	DOOR SWEEP	C627A	CL	NGP
1	EA	THRESHOLD	659 MS/LA	AL	NGP
1	EA	DOOR CONTACT	679-05HM	BLK	SCE
1	EA	MOTION SENSOR	SCANII	WHT	SCE
			ACCESS CONTROL - WORK OF DIVISION 28		
			POWER SUPPLY - WORK OF DIVISION 28		

**HW SET: 43**

DOOR NUMBER:

**118A****176A****185A**

EACH TO HAVE:

<u>Qty</u>		<u>Description</u>	<u>Catalog Number</u>	<u>Finish</u>	<u>Mfr</u>
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	VANDL STOREROOM LOCK	ND96PD RHO	626	SCH
1	EA	SURFACE CLOSER	4011 WMS	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B4E	630	IVE
1	EA	WALL STOP	WS406/407CCV	630	IVE
3	EA	SILENCER	SR64	GRY	IVE

**HW SET: 44**

DOOR NUMBER:

**198A**

EACH TO HAVE:

<u>Qty</u>		<u>Description</u>	<u>Catalog Number</u>	<u>Finish</u>	<u>Mfr</u>
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	VANDL STOREROOM LOCK	ND96PD RHO	626	SCH
1	EA	SURFACE CLOSER	4011 WMS	689	LCN
1	EA	WALL STOP	WS406/407CCV	630	IVE
1	SET	SEALS	5050B (HEAD & JAMBS)	BRN	NGP

**HW SET: 45**

DOOR NUMBER:

**179A-A**

EACH TO HAVE:

<u>Qty</u>		<u>Description</u>	<u>Catalog Number</u>	<u>Finish</u>	<u>Mfr</u>
3	EA	HINGE	5BB1 4.5 X 4.5 NRP	630	IVE
1	EA	PANIC HARDWARE	LD-98-NL	626	VON
1	EA	RIM CYLINDER	20-057-ICX	626	SCH
1	EA	FSIC CORE	23-030	626	SCH
1	EA	ELECTRIC STRIKE	9600 12/24VAC FSE	630	HES
1	EA	SURFACE CLOSER	4111 HEDA WMS	689	LCN
1	EA	WALL STOP	WS406/407CCV	630	IVE
1	EA	DRIP CAP	16A (OMIT IF OPENING IS PROTECTED)	CL	NGP
1	SET	SEALS	5050B (HEAD & JAMBS)	BRN	NGP
1	EA	DOOR SWEEP	C627A	CL	NGP
1	EA	THRESHOLD	659 MS/LA	AL	NGP
1	EA	DOOR CONTACT	679-05HM	BLK	SCE
1	EA	MOTION SENSOR	SCANII	WHT	SCE
			ACCESS CONTROL - WORK OF		
			DIVISION 28		
			POWER SUPPLY - WORK OF DIVISION		
			28		

**HW SET: 46**

DOOR NUMBER:

**179B**

EACH TO HAVE:

<u>Qty</u>		<u>Description</u>	<u>Catalog Number</u>	<u>Finish</u>	<u>Mfr</u>
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	FIRE EXIT HARDWARE	98-L-BE-F-06	626	VON
1	EA	SURFACE CLOSER	4111 SCUSH WMS	689	LCN
1	SET	SEALS	5050B (HEAD & JAMBS)	BRN	NGP



**HW SET: 47**

DOOR NUMBER:

**180A**

EACH TO HAVE:

<u>Qty</u>		<u>Description</u>	<u>Catalog Number</u>	<u>Finish</u>	<u>Mfr</u>
3	EA	HW HINGE	5BB1HW 5 X 4.5 NRP	652	IVE
1	EA	VANDL VESTIBULE LOCK	ND93PD RHO	626	SCH
1	EA	SURFACE CLOSER	4111 HEDA WMS	689	LCN
1	EA	ARMOR PLATE	8400 36" X 2" LDW B4E	630	IVE
1	EA	WALL STOP	WS406/407CCV	630	IVE
3	EA	SILENCER	SR64	GRY	IVE

**HW SET: 48**

DOOR NUMBER:

**180B-A**

EACH TO HAVE:

<u>Qty</u>		<u>Description</u>	<u>Catalog Number</u>	<u>Finish</u>	<u>Mfr</u>
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	VANDL STOREROOM LOCK	ND96PD RHO	626	SCH
1	EA	ARMOR PLATE	8400 36" X 2" LDW B4E	630	IVE
1	EA	WALL STOP	WS406/407CCV	630	IVE
3	EA	SILENCER	SR64	GRY	IVE

**HW SET: 49**

DOOR NUMBER:

**102A****119A****203A**

EACH TO HAVE:

<u>Qty</u>		<u>Description</u>	<u>Catalog Number</u>	<u>Finish</u>	<u>Mfr</u>
1	EA	FLOOR STOP	FS444	626	IVE
			BALANCE OF HARDWARE BY GLASS DOOR MFR		

**NOTE: GLASS DOOR ASSEMBLY.****HW SET: 50**

DOOR NUMBER:

**181A-A**

EACH TO HAVE:

<u>Qty</u>		<u>Description</u>	<u>Catalog Number</u>	<u>Finish</u>	<u>Mfr</u>
1	EA	CONT. HINGE	112HD	628	IVE
1	EA	CONT. HINGE	112HD EPT	628	IVE
1	EA	POWER TRANSFER	EPT10 CON	689	VON
1	EA	KEYED REMOVABLE MULLION	KR4954-STAB	689	VON
1	EA	ELEC PANIC HARDWARE	EL-98-NL-CON	626	VON

DOOR HARDWARE SCHEDULE – 08 71 01

1	EA	PANIC HARDWARE	LD-98-EO	626	VON
1	EA	RIM CYLINDER	20-057-ICX	626	SCH
1	EA	MORTISE CYLINDER	20-061-ICX	626	SCH
2	EA	FSIC CORE	23-030	626	SCH
1	EA	OH STOP	100S ADJ	630	GLY
1	EA	SURFACE CLOSER	4111 SCUSH WMS	689	LCN
1	EA	SURF. AUTO OPERATOR	9531 MS	ANCLR	LCN
1	EA	CUSH SHOE SUPPORT	4110-30	689	LCN
1	EA	BLADE STOP SPACER	4110-61	689	LCN
1	EA	DRIP CAP	16A (OMIT IF OPENING IS PROTECTED)	CL	NGP
1	EA	MULLION SEAL	5100	BLK	NGP
2	EA	DOOR SWEEP	200NA (PULL SIDE OF DOORS)	CL	NGP
1	EA	THRESHOLD	896S MS/LA	AL	NGP
2	EA	DOOR CONTACT	679-05HM	BLK	SCE
1	EA	POWER SUPPLY	PS914 900-BBK 900-2RS KL900 (CONTROLS 181A-A & 181A-B) ACCESS CONTROL - WORK OF DIVISION 28	LGR	VON
1			PROVIDE FACTORY POINT TO POINT WIRING DIAGRAMS		
1			PROVIDE RISER DIAGRAMS WEATHERSTRIP BY DOOR/FRAME MANUFACTURER		

**NOTE 1: 120VAC TO POWER SUPPLY AND ADA OPERATOR. RUN 12 GA WIRE (HOME RUN 0-200 LINEAL FEET) TO EL DEVICES. FREE EGRESS FROM COURTYARD TO BUILDING AT ALL TIMES.**  
**NOTE 2: COORDINATE DOOR UNDERCUT WITH THRESHOLD. DOORS MUST MAKE FULL CONTACT WITH THRESHOLD SEAL.**

**HW SET: 51 - Not Used**

**HW SET: 52**

DOOR NUMBER:  
**183A**

EACH TO HAVE:

<u>Qty</u>		<u>Description</u>	<u>Catalog Number</u>	<u>Finish</u>	<u>Mfr</u>
6	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	MANUAL FLUSH BOLT	FB358 (BOTTOM BOLT)	626	IVE
1	EA	AUTO FLUSH BOLT	FB41T (TOP BOLT)	630	IVE
1	EA	DUST PROOF STRIKE	DP2	626	IVE
1	EA	VANDL STOREROOM LOCK	ND96PD RHO	626	SCH
2	EA	WALL STOP	WS406/407CCV	630	IVE
1	EA	ASTRAGAL	158SA (PUSH SIDE INACTIVE LEAF)	CL	NGP
2	EA	SILENCER	SR64	GRY	IVE

**HW SET: 53**

DOOR NUMBER:

**184A**

EACH TO HAVE:

<u>Qty</u>		<u>Description</u>	<u>Catalog Number</u>	<u>Finish</u>	<u>Mfr</u>
3	EA	HW HINGE	5BB1HW 5 X 4.5	652	IVE
1	EA	VANDL VESTIBULE LOCK	ND93PD RHO	626	SCH
1	EA	FLOOR STOP	FS436	626	IVE
1	SET	SEALS	137NA (HEAD & JAMBS)	CL	NGP
1	EA	SURFACE AUTOMATIC DOOR BOTTOM	420NA	CL	NGP
1	EA	THRESHOLD	411 MS/LA	AL	NGP

**HW SET: 54**

DOOR NUMBER:

**184B            186A**

EACH TO HAVE:

<u>Qty</u>		<u>Description</u>	<u>Catalog Number</u>	<u>Finish</u>	<u>Mfr</u>
3	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	VANDL VESTIBULE LOCK	ND93PD RHO	626	SCH
1	EA	OH STOP	90S J	630	GLY
1	SET	SEALS	137NA (HEAD & JAMBS)	CL	NGP
1	EA	SURFACE AUTOMATIC DOOR BOTTOM	420NA	CL	NGP
1	EA	THRESHOLD	411 MS/LA	AL	NGP

**HW SET: 55**

DOOR NUMBER:

**184C**

EACH TO HAVE:

<u>Qty</u>		<u>Description</u>	<u>Catalog Number</u>	<u>Finish</u>	<u>Mfr</u>
6	EA	HW HINGE	5BB1HW 4.5 X 4.5 NRP	652	IVE
1	EA	KEYED REMOVABLE MULLION	KR4954-STAB	689	VON
1	EA	PANIC HARDWARE	98-EO	626	VON
1	EA	PANIC HARDWARE	98-NL	626	VON
1	EA	RIM CYLINDER	20-057-ICX	626	SCH
1	EA	MORTISE CYLINDER	20-061-ICX	626	SCH
2	EA	FSIC CORE	23-030	626	SCH
1	EA	SURFACE CLOSER	4111 CUSH WMS	689	LCN
1	EA	SURFACE CLOSER	4111 SCUSH WMS	689	LCN
1	SET	SEALS	5050B (HEAD & JAMBS)	BRN	NGP
1	EA	MULLION SEAL	5100	BLK	NGP

**HW SET: 56**

DOOR NUMBER:

**186B**

EACH TO HAVE:

<u>Qty</u>		<u>Description</u>	<u>Catalog Number</u>	<u>Finish</u>	<u>Mfr</u>
3	EA	HW HINGE	5BB1HW 4.5 X 4.5 NRP	652	IVE
1	EA	PANIC HARDWARE	98-NL	626	VON
1	EA	RIM CYLINDER	20-057-ICX	626	SCH
1	EA	FSIC CORE	23-030	626	SCH
1	EA	SURFACE CLOSER	4111 EDA WMS	689	LCN
1	EA	WALL STOP	WS406/407CCV	630	IVE
1	SET	SEALS	5050B (HEAD & JAMBS)	BRN	NGP

**HW SET: 57**

DOOR NUMBER:

**188A            194C**

EACH TO HAVE:

<u>Qty</u>		<u>Description</u>	<u>Catalog Number</u>	<u>Finish</u>	<u>Mfr</u>
1	EA	CONT. HINGE	112HD	628	IVE
1	EA	PANIC HARDWARE	LD-98-NL	626	VON
1	EA	RIM CYLINDER	20-057-ICX	626	SCH
1	EA	FSIC CORE	23-030	626	SCH
1	EA	ELECTRIC STRIKE	9600 12/24VAC FSE	630	HES
1	EA	SURFACE CLOSER	4111 SCUSH WMS	689	LCN
1	EA	CUSH SHOE SUPPORT	4110-30	689	LCN
1	EA	BLADE STOP SPACER	4110-61	689	LCN
1	EA	DRIP CAP	16A (OMIT IF OPENING IS PROTECTED)	CL	NGP
1	EA	DOOR SWEEP	C627A	CL	NGP
1	EA	THRESHOLD	659 MS/LA	AL	NGP
1	EA	DOOR CONTACT	679-05HM	BLK	SCE
1	EA	MOTION SENSOR	SCANII	WHT	SCE
			ACCESS CONTROL - WORK OF		
			DIVISION 28		
			POWER SUPPLY - WORK OF DIVISION		
			28		
			WEATHERSTRIP BY DOOR/FRAME		
			MANUFACTURER		

**HW SET: 58**

DOOR NUMBER:

**188A-A            188B-A            188C-A            188D-A            188E-A**

EACH TO HAVE:

<u>Qty</u>		<u>Description</u>	<u>Catalog Number</u>	<u>Finish</u>	<u>Mfr</u>
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	PASSAGE SET	ND10S RHO	626	SCH
1	EA	FLOOR STOP	FS436	626	IVE
1	SET	SEALS	137NA (HEAD & JAMBS)	CL	NGP
1	EA	SURFACE AUTOMATIC DOOR BOTTOM	420NA	CL	NGP
1	EA	THRESHOLD	411 MS/LA	AL	NGP

**HW SET: 59**

DOOR NUMBER:

**188B**

EACH TO HAVE:

<u>Qty</u>		<u>Description</u>	<u>Catalog Number</u>	<u>Finish</u>	<u>Mfr</u>
3	EA	HW HINGE	5BB1HW 4.5 X 4.5 NRP	652	IVE
1	EA	PANIC HARDWARE	98-NL	626	VON
1	EA	RIM CYLINDER	20-057-ICX	626	SCH
1	EA	FSIC CORE	23-030	626	SCH
1	EA	SURFACE CLOSER	4111 EDA ST-1631 WMS	689	LCN
1	EA	WALL STOP	WS406/407CCV	630	IVE
1	SET	SEALS	700SA (HEAD & JAMBS)	CL	NGP
1	EA	SURFACE AUTOMATIC DOOR BOTTOM	420NA	CL	NGP
1	EA	THRESHOLD	411 MS/LA	AL	NGP

NOTE: INSTALL PERIMETER SEALS BEFORE EXIT DEVICE, STRIKE, AND CLOSER. DO NOT NOTCH SEALS. STRIKE AND CLOSER INSTALL ON TOP OF SEALS. ADJUST CLOSER AND PANIC TEMPLATES ACCORDINGLY.

**HW SET: 60**

DOOR NUMBER:

**191A****193A****195A****197A**

EACH TO HAVE:

<u>Qty</u>		<u>Description</u>	<u>Catalog Number</u>	<u>Finish</u>	<u>Mfr</u>
1	EA	CONT. HINGE	112HD	628	IVE
1	EA	VANDL STOREROOM LOCK	ND96PD RHO	626	SCH
1	EA	ELECTRIC STRIKE	8000-801A 12/24VDC FSE	630	HES
1	EA	LOCK GUARD	LG14	630	IVE
1	EA	SURFACE CLOSER	4111 SHCUSH WMS	689	LCN
1	EA	CUSH SHOE SUPPORT	4110-30	689	LCN
1	EA	BLADE STOP SPACER	4110-61	689	LCN
1	EA	DRIP CAP	16A (OMIT IF OPENING IS PROTECTED)	CL	NGP
1	EA	DOOR SWEEP	C627A	CL	NGP
1	EA	THRESHOLD	659 MS/LA	AL	NGP
1	EA	DOOR CONTACT	679-05HM	BLK	SCE
1	EA	MOTION SENSOR	SCANII	WHT	SCE
		ACCESS CONTROL - WORK OF DIVISION 28			
		POWER SUPPLY - WORK OF DIVISION 28			
		WEATHERSTRIP BY DOOR/FRAME MANUFACTURER			

**HW SET: 61**

DOOR NUMBER:

**M288B**

EACH TO HAVE:

<u>Qty</u>		<u>Description</u>	<u>Catalog Number</u>	<u>Finish</u>	<u>Mfr</u>
3	EA	HINGE	5BB1 4.5 X 4.5	630	IVE
1	EA	STOREROOM LOCK	D80PD ORB	626	SCH
1	EA	OH STOP	100S ADJ	630	GLY
1	SET	SEALS	700SA (HEAD & JAMBS)	CL	NGP
1	EA	DOOR SHOE	216AV	AL	PEM
1	EA	DOOR CONTACT	679-05HM	BLK	SCE

NOTE: 4-SIDED FRAME.

**HW SET: 62**

DOOR NUMBER:

**194D**

EACH TO HAVE:

<u>Qty</u>		<u>Description</u>	<u>Catalog Number</u>	<u>Finish</u>	<u>Mfr</u>
1	EA	CONT. HINGE	112HD	628	IVE
1	EA	PANIC HARDWARE	98-NL-1439	626	VON
1	EA	RIM CYLINDER	20-057-ICX	626	SCH
1	EA	FSIC CORE	23-030	626	SCH
1	EA	SURFACE CLOSER	4111 SCUSH WMS	689	LCN
1	EA	CUSH SHOE SUPPORT	4110-30	689	LCN
1	EA	BLADE STOP SPACER	4110-61	689	LCN
1	EA	DRIP CAP	16A (OMIT IF OPENING IS PROTECTED)	CL	NGP
1	EA	DOOR SWEEP	C627A	CL	NGP
1	EA	THRESHOLD	659 MS/LA	AL	NGP
1	EA	DOOR CONTACT	679-05HM	BLK	SCE
			WEATHERSTRIP BY DOOR/FRAME MANUFACTURER		

**HW SET: 63**

DOOR NUMBER:

**209A-A**

EACH TO HAVE:

<u>Qty</u>		<u>Description</u>	<u>Catalog Number</u>	<u>Finish</u>	<u>Mfr</u>
3	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	VANDL STOREROOM LOCK	ND96PD RHO	626	SCH
1	EA	WALL STOP	WS406/407CCV	630	IVE
3	EA	SILENCER	SR64	GRY	IVE

**HW SET: 64**

DOOR NUMBER:

**218A**

EACH TO HAVE:

<u>Qty</u>		<u>Description</u>	<u>Catalog Number</u>	<u>Finish</u>	<u>Mfr</u>
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	VANDL VESTIBULE LOCK	ND93PD RHO	626	SCH
1	EA	OH STOP	90S	630	GLY
3	EA	SILENCER	SR64	GRY	IVE

**HW SET: 65**

DOOR NUMBER:

**219A**

EACH TO HAVE:

<u>Qty</u>		<u>Description</u>	<u>Catalog Number</u>	<u>Finish</u>	<u>Mfr</u>
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	VANDL STOREROOM LOCK	ND96PD RHO	626	SCH
1	EA	OH STOP	90S	630	GLY
3	EA	SILENCER	SR64	GRY	IVE

**HW SET: 66**

DOOR NUMBER:

**M265A.1**

EACH TO HAVE:

<u>Qty</u>		<u>Description</u>	<u>Catalog Number</u>	<u>Finish</u>	<u>Mfr</u>
3	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	VANDL STOREROOM LOCK	ND96PD RHO	626	SCH
1	EA	SURFACE CLOSER	4111 SCUSH WMS	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B4E	630	IVE
1	SET	SEALS	5050B (HEAD & JAMBS)	BRN	NGP

**HW SET: 67**

DOOR NUMBER:

**M265A.2**

EACH TO HAVE:

<u>Qty</u>		<u>Description</u>	<u>Catalog Number</u>	<u>Finish</u>	<u>Mfr</u>
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	PASSAGE SET	ND10S RHO	626	SCH
1	EA	SURFACE CLOSER	4111 CUSH WMS	689	LCN
1	SET	SEALS	5050B (HEAD & JAMBS)	BRN	NGP

**HW SET: 68**

DOOR NUMBER:

**M281A-A**

EACH TO HAVE:

<u>Qty</u>		<u>Description</u>	<u>Catalog Number</u>	<u>Finish</u>	<u>Mfr</u>
3	EA	HINGE	5BB1 4.5 X 4.5	630	IVE
1	EA	PASSAGE SET	ND10S RHO	626	SCH
1	EA	SURFACE CLOSER	4111 EDA WMS	689	LCN
1	EA	DRIP CAP	16A (OMIT IF OPENING IS PROTECTED)	CL	NGP
1	SET	SEALS	5050B (HEAD & JAMBS)	BRN	NGP
1	EA	DOOR SWEEP	C627A	CL	NGP
1	EA	THRESHOLD	659 MS/LA	AL	NGP
1	EA	DOOR CONTACT	679-05HM	BLK	SCE

**HW SET: 69**

DOOR NUMBER:

**128A                      165D                      166E**

EACH TO HAVE:

<u>Qty</u>		<u>Description</u>	<u>Catalog Number</u>	<u>Finish</u>	<u>Mfr</u>
2	EA	CONT. HINGE	112HD	628	IVE
1	EA	KEYED REMOVABLE MULLION	KR4954-STAB	689	VON
2	EA	PANIC HARDWARE	LD-98-EO	626	VON
1	EA	MORTISE CYLINDER	20-061-ICX	626	SCH
1	EA	FSIC CORE	23-030	626	SCH
2	EA	SURFACE CLOSER	4111 SCUSH WMS	689	LCN
2	EA	CUSH SHOE SUPPORT	4110-30	689	LCN
2	EA	BLADE STOP SPACER	4110-61	689	LCN
1	EA	DRIP CAP	16A (OMIT IF OPENING IS PROTECTED)	CL	NGP
1	EA	MULLION SEAL	5100	BLK	NGP
2	EA	DOOR SWEEP	C627A	CL	NGP
1	EA	THRESHOLD	659 MS/LA	AL	NGP
2	EA	DOOR CONTACT	679-05HM	BLK	SCE
			WEATHERSTRIP BY DOOR/FRAME MANUFACTURER		

**NOTE: EXIT ONLY. NO EXTERIOR TRIM.****HW SET: 70**

DOOR NUMBER:

**223A**

EACH TO HAVE:

<u>Qty</u>		<u>Description</u>	<u>Catalog Number</u>	<u>Finish</u>	<u>Mfr</u>
3	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	PRIVACY LOCK WITH OCCUPIED INDICATOR	L9456P 06A L583-363 L283-722	626	SCH
1	EA	SURFACE CLOSER	4111 EDA WMS	689	LCN
1	EA	WALL STOP	WS406/407CCV	630	IVE
1	SET	SEALS	5050B (HEAD & JAMBS)	BRN	NGP



**HW SET: 71**

DOOR NUMBER:

**181D**

EACH TO HAVE:

<u>Qty</u>		<u>Description</u>	<u>Catalog Number</u>	<u>Finish</u>	<u>Mfr</u>
1	EA	CONT. HINGE	112HD	628	IVE
1	EA	CONT. HINGE	112HD EPT	628	IVE
1	EA	POWER TRANSFER	EPT10 CON	689	VON
1	EA	KEYED REMOVABLE MULLION	KR4954-STAB	689	VON
1	EA	ELEC PANIC HARDWARE	EL-98-NL-CON	626	VON
1	EA	PANIC HARDWARE	LD-98-EO	626	VON
1	EA	RIM CYLINDER	20-057-ICX	626	SCH
1	EA	MORTISE CYLINDER	20-061-ICX	626	SCH
2	EA	FSIC CORE	23-030	626	SCH
1	EA	SURFACE CLOSER	4111 EDA WMS	689	LCN
1	EA	SURFACE CLOSER	4111 SCUSH WMS	689	LCN
1	EA	CUSH SHOE SUPPORT	4110-30	689	LCN
2	EA	BLADE STOP SPACER	4110-61	689	LCN
2	EA	WALL STOP	WS406/407CCV	630	IVE
1	EA	DRIP CAP	16A (OMIT IF OPENING IS PROTECTED)	CL	NGP
1	EA	MULLION SEAL	5100	BLK	NGP
2	EA	DOOR SWEEP	C627A	CL	NGP
1	EA	THRESHOLD	659 MS/LA	AL	NGP
2	EA	DOOR CONTACT	679-05HM	BLK	SCE
1	EA	MOTION SENSOR	SCANII	WHT	SCE
1	EA	POWER SUPPLY	PS914 900-BBK KL900	LGR	VON
			ACCESS CONTROL - WORK OF DIVISION 28		
1			PROVIDE FACTORY POINT TO POINT WIRING DIAGRAMS		
1			PROVIDE RISER DIAGRAMS WEATHERSTRIP BY DOOR/FRAME MANUFACTURER		

**NOTE: 120VAC TO POWER SUPPLY. RUN 12 GA WIRE (HOME RUN 0-200 LINEAL FEET) TO EL DEVICE.**

**HW SET: 72**

DOOR NUMBER:

**202A**

EACH TO HAVE:

<u>Qty</u>		<u>Description</u>	<u>Catalog Number</u>	<u>Finish</u>	<u>Mfr</u>
2	EA	CONT. HINGE	112HD	628	IVE
2	SET	PUSH/PULL BAR	9103EZHD-12"-NO	630	IVE
2	EA	OH STOP	90S	630	GLY
2	EA	CONCEALED CLOSER	2031 ST-2211	689	LCN
			PERIMETER SEALS BY DOOR SUPPLIER		

**HW SET: 73**

DOOR NUMBER:

**151A-A            191B**

EACH TO HAVE:

<u>Qty</u>		<u>Description</u>	<u>Catalog Number</u>	<u>Finish</u>	<u>Mfr</u>
3	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	VANDL VESTIBULE LOCK	ND93PD RHO	626	SCH
1	EA	WALL STOP	WS406/407CCV	630	IVE
1	SET	SEALS	5050B (HEAD & JAMBS)	BRN	NGP

**HW SET: 74**

DOOR NUMBER:

**167A**

EACH TO HAVE:

<u>Qty</u>		<u>Description</u>	<u>Catalog Number</u>	<u>Finish</u>	<u>Mfr</u>
1	EA	CONT. HINGE	112HD	628	IVE
1	EA	CONT. HINGE	112HD EPT	628	IVE
1	EA	POWER TRANSFER	EPT10 CON	689	VON
1	EA	KEYED REMOVABLE MULLION	KR4954-STAB	689	VON
1	EA	ELEC PANIC HARDWARE	EL-98-NL-CON	626	VON
1	EA	PANIC HARDWARE	LD-98-EO	626	VON
1	EA	RIM CYLINDER	20-057-ICX	626	SCH
1	EA	MORTISE CYLINDER	20-061-ICX	626	SCH
2	EA	FSIC CORE	23-030	626	SCH
1	EA	OH STOP	100S ADJ	630	GLY
1	EA	SURFACE CLOSER	4111 SCUSH WMS	689	LCN
1	EA	SURF. AUTO OPERATOR	9542 MS	ANCLR	LCN
1	EA	CUSH SHOE SUPPORT	4110-30	689	LCN
1	EA	BLADE STOP SPACER	4110-61	689	LCN
1	EA	WEATHER RING	8310-801	PLA	LCN
1	EA	ACTUATOR, WALL MOUNT	8310-853T	630	LCN
1	EA	FLUSH MOUNT BOX	8310-867F	689	LCN
1	EA	DRIP CAP	16A (OMIT IF OPENING IS PROTECTED)	CL	NGP
1	EA	MULLION SEAL	5100	BLK	NGP
2	EA	DOOR SWEEP	C627A	CL	NGP
1	EA	THRESHOLD	659 MS/LA	AL	NGP
2	EA	DOOR CONTACT	679-05HM	BLK	SCE
1	EA	MOTION SENSOR	SCANII	WHT	SCE
1	EA	POWER SUPPLY	PS914 900-BBK 900-2RS KL900 (CONTROLS 167A & 165E) WEATHERSTRIP BY DOOR/FRAME MANUFACTURER	LGR	VON

**NOTE: 120VAC TO POWER SUPPLY AND ADA OPERATOR. RUN 12 GA WIRE (HOME RUN 0-200 LINEAL FEET) TO EL DEVICES. CONNECT FA CIRCUIT IN POWER SUPPLY TO OPERATOR AND FIRE ALARM. ADA OPERATOR TO BECOME INOPERATIVE DURING FIRE ALARM ACTIVATION. BOLLARD REQUIRED TO MOUNT ACTUATOR. BOLLARD PROVIDED BY CONTRACTOR.**

**HW SET: 75**

DOOR NUMBER:

**165E**

EACH TO HAVE:

<u>Qty</u>		<u>Description</u>	<u>Catalog Number</u>	<u>Finish</u>	<u>Mfr</u>
1	EA	CONT. HINGE	112HD	628	IVE
1	EA	CONT. HINGE	112HD EPT	628	IVE
1	EA	POWER TRANSFER	EPT10 CON	689	VON
1	EA	KEYED REMOVABLE MULLION	KR4954-STAB	689	VON
1	EA	PANIC HARDWARE	98-EO	626	VON
1	EA	ELEC PANIC HARDWARE	EL-98-NL-CON	626	VON
1	EA	RIM CYLINDER	20-057-ICX	626	SCH
1	EA	MORTISE CYLINDER	20-061-ICX	626	SCH
2	EA	FSIC CORE	23-030	626	SCH
1	EA	OH STOP	100S ADJ	630	GLY
1	EA	SURFACE CLOSER	4111 SCUSH WMS	689	LCN
1	EA	SURF. AUTO OPERATOR	9542 MS	ANCLR	LCN
1	EA	CUSH SHOE SUPPORT	4110-30	689	LCN
1	EA	BLADE STOP SPACER	4110-61	689	LCN
1	EA	ACTUATOR, WALL MOUNT	8310-853T	630	LCN
1	EA	FLUSH MOUNT BOX	8310-867F	689	LCN
			PERIMETER SEALS BY DOOR SUPPLIER		

**NOTE: 120VAC TO POWER SUPPLY AND ADA OPERATOR. SHARED POWER SUPPLY SPECIFIED AT 167A. RUN 12 GA WIRE (HOME RUN 0-200 LINEAL FEET) TO EL DEVICES. CONNECT FA CIRCUIT IN POWER SUPPLY TO OPERATOR AND FIRE ALARM. ADA OPERATOR TO BECOME INOPERATIVE DURING FIRE ALARM ACTIVATION.**

**HW SET: 76**

DOOR NUMBER:

**174B**

EACH TO HAVE:

<u>Qty</u>		<u>Description</u>	<u>Catalog Number</u>	<u>Finish</u>	<u>Mfr</u>
6	EA	HINGE	5BB1 4.5 X 4.5 NRP	630	IVE
1	EA	POWER TRANSFER	EPT10 CON	689	VON
1	EA	KEYED REMOVABLE MULLION	KR4954-STAB	689	VON
1	EA	ELEC PANIC HARDWARE	EL-98-NL-CON	626	VON
1	EA	PANIC HARDWARE	LD-98-EO	626	VON
1	EA	RIM CYLINDER	20-057-ICX	626	SCH
1	EA	MORTISE CYLINDER	20-061-ICX	626	SCH
2	EA	FSIC CORE	23-030	626	SCH
2	EA	SURFACE CLOSER	4111 SCUSH ST-1586 WMS	689	LCN
1	EA	DRIP CAP	16A (OMIT IF OPENING IS PROTECTED)	CL	NGP
1	SET	SEALS	700SA (HEAD & JAMBS)	CL	NGP
1	EA	MULLION SEAL	5100	BLK	NGP
2	EA	DOOR SWEEP	C627A	CL	NGP

DOOR HARDWARE SCHEDULE – 08 71 01

1	EA	THRESHOLD	659 MS/LA	AL	NGP
2	EA	DOOR CONTACT	679-05HM	BLK	SCE
1	EA	MOTION SENSOR	SCANII	WHT	SCE
1	EA	POWER SUPPLY	PS914 900-BBK KL900	LGR	VON
			ACCESS CONTROL - WORK OF		
			DIVISION 28		

NOTE 1: 120VAC TO POWER SUPPLY. RUN 12 GA WIRE (HOME RUN 0-200 LINEAL FEET) TO EL DEVICE.

NOTE 2: INSTALL PERIMETER SEAL BEFORE CLOSERS. DO NOT NOTCH SEAL CLOSERS INSTALL ON TOP OF SEAL. ADJUST TEMPLATES ACCORDINGLY.

**HW SET: 77**

DOOR NUMBER:

151D                      153D                      155C

EACH TO HAVE:

<u>Qty</u>		<u>Description</u>	<u>Catalog Number</u>	<u>Finish</u>	<u>Mfr</u>
1	EA	THRESHOLD	315	AL	NGP
			BALANCE OF HARDWARE BY MFR		

**HW SET: 78**

DOOR NUMBER:

M301H                      M301I                      M301J

EACH TO HAVE:

<u>Qty</u>		<u>Description</u>	<u>Catalog Number</u>	<u>Finish</u>	<u>Mfr</u>
2	EA	HINGE	5BB1 4.5 X 4.5	630	IVE
1	EA	STOREROOM LOCK	D80PD ORB	626	SCH
1	EA	OH STOP	100S ADJ	630	GLY
1	SET	SEALS	700SA (HEAD & JAMBS)	CL	NGP
1	EA	DOOR SHOE	216AV	AL	PEM
1	EA	DOOR CONTACT	679-05HM	BLK	SCE

NOTE: 4-SIDED FRAME.

**HW SET: 79**

DOOR NUMBER:

L-001

EACH TO HAVE:

<u>Qty</u>		<u>Description</u>	<u>Catalog Number</u>	<u>Finish</u>	<u>Mfr</u>
2	EA	CONT. HINGE	700	630	IVE
1	EA	KEYED REMOVABLE MULLION	KR4954-STAB	689	VON
1	EA	PANIC HARDWARE	35A-EO	626	VON
1	EA	PANIC HARDWARE	35A-L-06	626	VON
1	EA	RIM CYLINDER	20-057-ICX	626	SCH
1	EA	MORTISE CYLINDER	20-061-ICX	626	SCH
2	EA	FSIC CORE	23-030	626	SCH
2	EA	SURFACE CLOSER	4111 SCUSH SRI ST-1586 WMS	689	LCN
2	EA	MOUNTING PLATE	4110-18	689	LCN

DOOR HARDWARE SCHEDULE – 08 71 01

1	EA	DRIP CAP	16A (OMIT IF OPENING IS PROTECTED)	CL	NGP
1	SET	SEALS	700SA (HEAD & JAMBS)	CL	NGP
1	EA	MULLION SEAL	5100	BLK	NGP
2	EA	DOOR SWEEP	C627A	CL	NGP
1	EA	THRESHOLD	659 MS/LA	AL	NGP

**NOTE: INSTALL PERIMETER SEAL BEFORE CLOSERS. DO NOT NOTCH SEAL. CLOSERS INSTALL ON TOP OF SEAL. ADJUST TEMPLATES ACCORDINGLY. COORDINATE SPECIFIED HARDWARE WITH CUSTOM DOOR/FRAME MANUFACTURER. ADVISE OF ANY CONFLICTS WITH HARDWARE AND DOORS/FRAME.**

**END OF SCHEDULE**

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

- A. Glass.
- B. Sealed insulated glass units.
- C. Sealed insulated internally shaded glass units.
- D. Interior butt glazed wall.
- E. Glazing compounds and accessories.

**1.02 RELATED REQUIREMENTS**

- A. Section 06 40 00 - Architectural Woodwork: Custom display cases to accept interior glass.
- B. Section 06 41 00 - Architectural Wood Casework: Cabinets with requirements for glass shelves .
- C. Section 08 11 13 - Hollow Metal Doors and Frames: Glazed doors and borrowed lites.
- D. Section 08 14 16 - Flush Wood Doors: Glazed lites in doors.
- E. Section 08 32 00 - Sliding Glass Doors: Glazing furnished by door manufacturer.
- F. Section 08 36 13 - Sectional Doors: Glazed lites in doors.
- G. Section 08 41 26 - All-Glass Entrances and Storefronts: Glazing furnished as part of entrance assembly.
- H. Section 08 42 29 - Automatic Entrances: Glazing furnished as part of door assembly.
- I. Section 08 43 13 - Aluminum-Framed Storefronts.
- J. Section 08 44 13 - Glazed Aluminum Curtain Walls.

**1.03 REFERENCE STANDARDS**

- A. 16 CFR 1201 - Safety Standard for Architectural Glazing Materials; current edition.
- B. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2014.
- C. ASTM C1036 - Standard Specification for Flat Glass; 2011e1.
- D. ASTM C1048 - Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass; 2012.
- E. ASTM C1172 - Standard Specification for Laminated Architectural Flat Glass; 2009e1.
- F. ASTM C1193 - Standard Guide for Use of Joint Sealants; 2013.
- G. ASTM E 773 - Standard Test Method for Accelerated Weathering of Sealed Insulating Glass Units; 2001.
- H. ASTM E 774 - Standard Specification for the Classification of the Durability of Sealed Insulating Glass Units; 1997.
- I. ASTM E2190 - Standard Specification for Insulating Glass Unit Performance and Evaluation; 2010.
- J. GANA (GM) - GANA Glazing Manual; Glass Association of North America; 2009.
- K. GANA (SM) - GANA Sealant Manual; Glass Association of North America; 2008.

**1.04 PERFORMANCE REQUIREMENTS**

- A. Select type and thickness of exterior glass to withstand dead loads and wind loads acting normal to plane of glass at design pressures calculated in accordance with Oregon Structural Specialty code.
  - 1. Use the procedure specified in ASTM E 1300 to determine glass type and thickness.
  - 2. Limit glass deflection to 1/200 or flexure limit of glass, whichever is less, with full recovery of glazing materials.
  - 3. Thicknesses listed are minimum.

**1.05 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data on Glazing Compounds: Provide chemical, functional, and environmental characteristics, limitations, special application requirements. Identify available colors.
- C. Samples: Submit two samples 12 inch in size of glass units, showing coloration and design.

**1.06 QUALITY ASSURANCE**

- A. Perform Work in accordance with GANA Glazing Manual and GANA Sealant Manual for glazing installation methods.
- B. Installer Qualifications: Company specializing in performing the work of this section with minimum three years documented experience.

**1.07 PRE-INSTALLATION MEETING**

- A. Convene one week before starting work of this section.

**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 00 - Closeout Submittals, for additional warranty requirements.
- B. Sealed Insulating Glass Units: Provide a five (5) year warranty to include coverage for seal failure, interpane dusting or misting, including replacement of failed units.
- C. Laminated Glass: Provide a five (5) year warranty to include coverage for delamination, including replacement of failed units.

**PART 2 PRODUCTS****2.01 INSULATING GLASS UNITS****2.02 GLASS MATERIALS**

- A. Float Glass: All glazing is to 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. Thicknesses: As indicated; for exterior glazing comply with specified requirements for wind load design regardless of specified thickness.
- B. Laminated Glass: 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.
- C. Spandrel Glass (SP): ASTM C1048, Kind HS heat strengthened, Condition B (spandrel glass, one-surface ceramic coated), Type 1, Quality q3; 1/4 inch thick minimum; ceramic frit coating:
1. Veraspan, Subdued Gray by Viracon, Inc: [www.viracon.com](http://www.viracon.com).
  2. Substitutions: See Section 01 60 00 - Product Requirements.
- D. Project Port Glass: Anti-reflective glass, 6 mm thick.
1. AR Portglass by Kelmar Systems, Inc: [www.kelmarsystems.com](http://www.kelmarsystems.com).
  2. Substitutions: See Section 01 60 00 - Product Requirements.

### 2.03 SEALED INSULATING GLASS UNITS

- A. Sealed Insulating Glass Units: Types as indicated.
1. Durability: Certified by an independent testing agency to comply with ASTM E2190.
  2. Edge Spacers: Aluminum, bent and soldered corners.
  3. Edge Seal: Glass to elastomer with supplementary silicone sealant.
  4. Edge Seal Color: Black.
  5. Purge interpane space with dry hermetic air.
- B. Insulated Safety Glass Units (Type ISGU-A) (North and East Exposures): Double pane with glass to elastomer edge seal.
1. Outer pane of Low E clear safety glass, inner pane of clear safety glass.
  2. Place low E coating on No. 2 surface within the unit.
  3. Durability: Certified by an independent testing agency to comply with ASTM E 2190.
  4. Purge interpane space with dry hermetic air.
  5. U Value: 0.29 maximum.
  6. Shading Coefficient: 0.45 maximum.
  7. Visual Light Transmittance: 70 percent minimum.
  8. Total unit thickness of 1 inch minimum.
  9. Product: Solarban 60 by PPG Industries: [www.ppg.com](http://www.ppg.com).
- C. Insulated Safety Glass Units (Type ISGU-B) (South and West Exposures): Double pane with glass to elastomer edge seal.
1. Outer pane of Low E clear safety glass, inner pane of clear safety glass.
  2. Place low E coating on No. 2 surface within the unit.
  3. Durability: Certified by an independent testing agency to comply with ASTM E 2190.
  4. Purge interpane space with dry hermetic air.
  5. U Value: 0.28 maximum.
  6. Shading Coefficient: 0.32 maximum.
  7. Visual Light Transmittance: 64 percent minimum.
  8. Total unit thickness of 1 inch minimum.
  9. Product: Solarban 70XL by PPG Industries: [www.ppg.com](http://www.ppg.com).
- D. Insulated Glass Units (Type IGU-A) (North and East Exposures): Double pane with glass to elastomer edge seal.
1. Outer pane of Low E clear annealed glass, inner pane of clear annealed glass.
  2. Place low E coating on No.2 surface within the unit.
  3. Comply with ASTM E 774 and E 773, Class CBA.
  4. Purge interpane space with dry hermetic air.
  5. U Value: 0.29 maximum.
  6. Shading Coefficient: 0.45 maximum
  7. Visual Light Transmittance: 70 percent minimum.
  8. Total unit thickness of 1 inch minimum.
  9. Product: Solarban 60 by PPG Industries: [www.ppg.com](http://www.ppg.com).
- E. Insulated Glass Units (Type IGU-B) (South and West Exposures): Double pane with glass to elastomer edge seal.
1. Outer pane of Low E clear annealed glass, inner pane of clear annealed glass.
  2. Place low E coating on No.2 surface within the unit.



3. Comply with ASTM E 774 and E 773, Class CBA.
4. Purge interpane space with dry hermetic air.
5. U Value: 0.28 maximum.
6. Shading Coefficient: 0.32 maximum.
7. Visual Light Transmittance: 64 percent minimum.
8. Total unit thickness of 1 inch minimum.
9. Product: Solarban 70XL by PPG Industries: [www.ppg.com](http://www.ppg.com).

#### **2.04 INTERNALLY SHADED GLAZING UNITS**

- A. Insulated Safety Internally Shaded Glass Units (Type ISGU-D)(West Exposure at Gymnasium): Double pane with internal honey comb core.
  1. Outer pan of Low E clear high strength glass, inner pane of Low E clear safety glass.
  2. Place low E coating on #2 and #4 surfaces.
  3. Internal Core: Honeycomb.
  4. Purge interpane space with dry hermetic air.
  5. U Value: 0.26 maximum.
  6. Shading Coefficient: 0.27 maximum.
  7. Visual Light Transmittance: 64 percent minimum.
  8. Total unit thickness of 1 inch minimum.
  9. Product: Clearshade CS-TTW7-1030-1030 by Panelite LLC: [www.panelite.us](http://www.panelite.us).
- B. Insulated Internally Shaded Glass Units (Type IGU-D)(West Exposure at Gymnasium): Double pane with internal honey comb core.
  1. Outer pan of Low E clear high strength glass, inner pane of Low E clear high strength glass.
  2. Place low E coating on #2 and #4 surfaces.
  3. Internal Core: Honeycomb.
  4. Purge interpane space with dry hermetic air.
  5. U Value: 0.26 maximum.
  6. Shading Coefficient: 0.27 maximum.
  7. Visual Light Transmittance: 64 percent minimum.
  8. Total unit thickness of 1 inch minimum.
  9. Product: Clearshade CS-TTW7-1030-1030 by Panelite LLC: [www.panelite.us](http://www.panelite.us).

#### **2.05 GLAZING COMPOUNDS**

- A. Silicone Sealant: Single component; neutral curing; capable of water immersion without loss of properties; non-bleeding, non-staining; ASTM C920, Type S, Grade NS, Class 25, Uses M, A, and G; with cured Shore A hardness range of 15 to 25; color as selected.

#### **2.06 BUTT-GLAZED WALL COMPONENTS**

- A. Top Rail: Stainless steel "U" channel, 1-3/4 inch wide x 1-11/16 inch high; brushed finish.
  1. UCBS3812SL by C. R. Lawrence Co.: [www.crlawrence.com](http://www.crlawrence.com).
  2. Substitutions: Refer to Section 01 60 00 - Product Requirements.
- B. Bottom Rail: Stainless steel side lite rail; 2 inch wide x 4 inch high; brushed finish.
  1. SR4SBSA3812SL by C. R. Lawrence Co.: [www.crlawrence.com](http://www.crlawrence.com).
  2. Substitutions: Refer to Section 01 60 00 - Product Requirements.
- C. Sealant: Silicone, optically clear.
  1. WCS1 Sealant by C. R. Lawrence Co.: [www.crlawrence.com](http://www.crlawrence.com).
  2. Substitutions: Refer to Section 01 60 00 - Product Requirements.

#### **2.07 GLAZING ACCESSORIES**

- A. Setting Blocks: Neoprene, 80 to 90 Shore A durometer hardness; ASTM C864 Option II. Length of 0.1 inch for each square foot of glazing or minimum 4 inch x width of glazing rabbet space minus 1/16 inch x height to suit glazing method and pane weight and area.

- B. Spacer Shims: Neoprene, 50 to 60 Shore A durometer hardness; ASTM C864 Option II. Minimum 3 inch long x one half the height of the glazing stop x thickness to suit application, self adhesive on one face.
- C. Glazing Tape: Preformed butyl compound with integral resilient tube spacing device; 10 to 15 Shore A durometer hardness; coiled on release paper; size as required; black color.
  - 1. Width: As required for application.
  - 2. Thickness: As required for application.
  - 3. Spacer Rod Diameter: As required for application.
  - 4. Manufacturers:
    - a. Pecora Corporation: [www.pecora.com](http://www.pecora.com).
    - b. Tremco Global Sealants: [www.tremcosealants.com](http://www.tremcosealants.com).
    - c. Substitutions: Refer to Section 01 60 00 - Product Requirements.
- D. Glazing Gaskets: Resilient silicone extruded shape to suit glazing channel retaining slot; ASTM C864 Option II; black color.

### **PART 3 EXECUTION**

#### **3.01 EXAMINATION**

- A. Verify that openings for glazing are correctly sized and within tolerance.
- 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. Clean contact surfaces with solvent and wipe dry.
- B. Seal porous glazing channels or recesses with substrate compatible primer or sealer.
- C. Prime surfaces scheduled to receive sealant.
- D. Install sealants in accordance with ASTM C1193 and GANA Sealant Manual.
- E. Install sealants in accordance with manufacturer's instructions.

#### **3.03 GLAZING METHODS**

##### **3.04 INSTALLATION - INTERIOR DRY METHOD (GASKET GLAZING)**

- A. Place setting blocks at 1/4 points with edge block no more than 6 inch from corners.
- B. Rest glazing on setting blocks and push against fixed stop with sufficient pressure on gasket to attain full contact.
- C. Install removable stops without displacing glazing gasket; exert pressure for full continuous contact.

##### **3.05 INSTALLATION - INTERIOR BUTT GLAZED METHOD (SEALANT ONLY)**

- A. Temporarily brace glass in position for duration of glazing process. Mask edges of glass at adjoining glass edges and between glass edges and framing members.
- B. Temporarily secure a small diameter non-adhering foamed rod on back side of joint.
- C. Apply sealant to open side of joint in continuous operation; thoroughly fill the joint without displacing the foam rod. Tool the sealant surface smooth to concave profile.
- D. Permit sealant to cure then remove foam backer rod. Apply sealant to opposite side, tool smooth to concave profile.
- E. Remove masking tape.

**3.06 INSTALLATION - INTERIOR DRY METHOD (TAPE AND TAPE)**

- A. Cut glazing tape to length and set against permanent stops, projecting 1/16 inch above sight line.
- B. Place setting blocks at 1/4 points with edge block no more than 6 inch from corners.
- C. Rest glazing on setting blocks and push against tape for full contact at perimeter of pane or unit.
- D. Place glazing tape on free perimeter of glazing in same manner described above.
- E. Install removable stop without displacement of tape. Exert pressure on tape for full continuous contact.
- F. Knife trim protruding tape.

**3.07 INSTALLATION - INTERIOR WET/DRY METHOD (TAPE AND SEALANT)**

- A. Cut glazing tape to length and install against permanent stops, projecting 1/16 inch above sight line.
- B. Place setting blocks at 1/4 points with edge block no more than 6 inch from corners.
- C. Rest glazing on setting blocks and push against tape to ensure full contact at perimeter of pane or unit.
- D. Install removable stops, spacer shims inserted between glazing and applied stops at 24 inch intervals, 1/4 inch below sight line.
- E. Fill gaps between pane and applied stop with polyurethane type sealant to depth equal to bite on glazing, to uniform and level line.
- F. Trim protruding tape edge.

**3.08 CLEANING**

- A. Remove glazing materials from finish surfaces.
- B. Remove labels after Work is complete.
- C. Clean glass and adjacent surfaces.

**3.09 PROTECTION**

- A. After installation, mark pane with an 'X' by using removable plastic tape or paste; do not mark heat absorbing or reflective glass units.

**END OF SECTION**

## GLAZING SURFACE FILMS

### PART 1 GENERAL

#### 1.01 SECTION INCLUDES

- A. Glazing film applied to new glazing assemblies.
- B. New Glazing: Factory or shop install film to glazing before installation in frames.
- C. Glazing assemblies to receive film are indicated on Drawings.

#### 1.02 RELATED REQUIREMENTS

- A. Section 08 80 00 - Glazing: Glazing to receive film.

#### 1.03 REFERENCE STANDARDS

- A. ANSI Z97.1 - American National Standard for Safety Glazing Materials Used in Buildings, Safety Performance Specifications and Methods of Test; 2004.

#### 1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
  - 1. Record of product certification for safety requirements.
  - 2. Preparation instructions and recommendations.
  - 3. Storage and handling requirements and recommendations.
  - 4. Installation methods.
- C. Samples: For each film product to be used, minimum size 4 inches by 6 inches, representing actual product, color, and patterns.
- D. Specimen warranty.

#### 1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Glazing film manufacturer specializing in manufacture of safety glazing films with minimum 10 years successful experience.
- B. Installer Qualifications: Certified by glazing film manufacturer.

#### 1.06 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 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. Provide 10 year manufacturer's replacement warranty to cover film against peeling, cracking, discoloration, and deterioration.

**PART 2 PRODUCTS****2.01 MANUFACTURERS**

- A. Basis of Design: 3M Window Film: [www.3m.com/us/arch\\_construct/scpd/windowfilm](http://www.3m.com/us/arch_construct/scpd/windowfilm).
- B. Other approved Manufacturers:
  1. CPFilms, Inc: [www.cpfindusprod.com](http://www.cpfindusprod.com).
  2. Madico, Inc: [www.madico.com](http://www.madico.com).
  3. Llumar by Solutia Inc: [www.llumar.com](http://www.llumar.com).
  4. Substitutions: See Section 01 60 00 - Product Requirements.

**2.02 MATERIALS**

- A. Glazing Film: Translucent polyester film for permanent bonding to glass.
  1. Thickness: 0.008 inch, minimum.
  2. Color: Matte white.
  3. Construction: Multi-ply laminate.
  4. Adhesive Type: Pressure sensitive acrylic.
  5. Product Code: 7725SE-314 Dusted Crystal.
- B. Accessory Materials: As recommended or required by film manufacturer.
- C. Glass Cleaner: As recommended by glazing film manufacturer.

**PART 3 EXECUTION****3.01 EXAMINATION**

- A. Examine glass and frames. Verify that existing conditions are adequate for proper application and performance of film.
- B. Verify glass is not cracked, chipped, broken, or damaged.
- C. Verify that frames are securely anchored and free of defects.
- D. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

**3.02 PREPARATION**

- A. Clean glass of dust, dirt, paint, oil, grease, mildew, mold, and other contaminants that would inhibit adhesion.
- B. Immediately prior to applying film, thoroughly wash glass with neutral cleaning solution.
- C. Protect adjacent surfaces.
- D. Do not begin installation until substrates have been properly prepared.

**3.03 INSTALLATION**

- A. Do not apply glazing film when surface temperature is less than 40 degrees F or if precipitation is imminent.
- B. Install in accordance with manufacturer's instructions, without air bubbles, wrinkles, streaks, bands, thin spots, pinholes, or gaps, as required to achieve specified performance.
- C. Accurately cut film with straight edges to required sizes allowing 1/16 inch to 1/8 inch gap at perimeter of glazed panel unless otherwise required by anchorage method.
- D. Seams: Seam film only as required to accommodate material sizes; form seams vertically without overlaps and gaps; do not install with horizontal seams.
- E. Clean glass and anchoring accessories following installation. Remove excess sealants and other glazing materials from adjacent finished surfaces.

- F. Remove labels and protective covers.

**3.04 PROTECTION**

- A. Protect installed products until completion of project.
- B. Touch-up, repair or replace damaged products before Substantial Completion.

**3.05 SCHEDULE**

- A. Conference Room Interior Relites. Refer to Drawings for layout.
- B. Media Center: Interior face of exterior window. Refer to Drawings for layout.

**END OF SECTION**

## LOUVERS

### PART 1 GENERAL

#### 1.01 SECTION INCLUDES

- A. Louvers, frames, and accessories.

#### 1.02 RELATED REQUIREMENTS

- A. Section 07 62 00 - Sheet Metal Flashing and Trim.
- B. Section 07 90 05 - Joint Sealers.

#### 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. AMCA 500-L - Laboratory Methods of Testing Louvers for Rating; Air Movement and Control Association International, Inc.; 2012.
- C. AMCA 511 - Certified Ratings Program Product Rating Manual for Air Control Devices; 2013.

#### 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 and interior 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 three years of documented experience.

#### 1.06 PROJECT CONDITIONS

- A. Coordinate work of this section with installation of metal siding.
- B. Coordinate work of this section with installation of mechanical ductwork .

#### 1.07 WARRANTY

- A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.
- B. Provide twenty year manufacturer warranty against distortion, metal degradation, and failure of connections.

### PART 2 PRODUCTS

#### 2.01 MANUFACTURERS

- A. Wall Louvers:
  1. Type K6844 by The Airo-lite Company: [www.airolite.com](http://www.airolite.com).
  2. Substitutions: See Section 01 60 00 - Product Requirements.

**2.02 LOUVERS**

- A. Louvers, General: Factory fabricated and assembled, complete with frame, mullions, and accessories; AMCA Certified under AMCA 511.
  - 1. Wind Load Resistance: Design to resist positive and negative wind load of 25 psf 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 intake and exhaust louvers.
- B. Stationary Louvers : Horizontal blade, extruded aluminum construction, with concealed intermediate mullions.
  - 1. Free Area: 50 percent, minimum.
  - 2. Blades: Drainable; 45 degree angle.
  - 3. Frame: 4 inches deep, channel profile; corner joints mitered and, with continuous recessed caulking channel each side.
  - 4. Metal Thickness: Frame 0.081 inch; blades 0.081 inch.
  - 5. Finish: Fluoropolymer coating, finished after fabrication.
  - 6. Color: Custom color as indicated on Drawings..

**2.03 MATERIALS**

- A. Extruded Aluminum: ASTM B221 (ASTM B221M), .
- B. Bird Screen: Interwoven wire mesh of steel, 0.063 inch diameter wire, 1/2 inch open weave, diagonal design.

**2.04 FINISHES**

- A. High Performance Organic Coatings: AAMA 2604; multiple coats, thermally cured fluoropolymer system.

**2.05 ACCESSORIES**

- A. Screens: Frame of same material as louver, with reinforced corners; removable, screw attached; installed on inside face of louver frame.
- B. Fasteners and Anchors: Galvanized steel.
- C. Head and Sill Flashings: See Section 07 62 00.
- D. Sealant: Type B - MS Polymer Sealant, as specified in Section 07 90 05.

**PART 3 EXECUTION****3.01 EXAMINATION**

- A. Verify that prepared openings and flashings are ready to receive work and opening dimensions are as indicated on shop drawings.
- B. Verify that field measurements are as indicated.

**3.02 INSTALLATION**

- A. Install louver assembly in accordance with manufacturer's instructions.
- B. Install louvers level and plumb.
- C. Install flashings and align louver assembly to ensure moisture shed from flashings and diversion of moisture to exterior.



- D. Secure louver frames in openings with concealed fasteners.
- E. Install perimeter sealant and backing rod in accordance with Section 07 90 05.

**3.03 ADJUSTING**

- A. Adjust operable louvers for freedom of movement of control mechanism. Lubricate operating joints.

**3.04 CLEANING**

- A. Strip protective finish coverings.
- B. Clean surfaces and components.

**END OF SECTION**

**GYPSUM BOARD ASSEMBLIES****PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Performance criteria for gypsum board assemblies.
- B. Metal stud wall framing.
- C. Shaft wall system.
- D. Acoustic insulation.
- E. Glass mat faced exterior gypsum sheathing.
- F. Gypsum wallboard.
- G. Exterior gypsum soffit board.
- H. Impact-resistant wallboard.
- I. Joint treatment and accessories.
- J. Textured finish system.
- K. Insulation for fire-rated ceilings.

**1.02 RELATED REQUIREMENTS**

- A. Section 05 40 00 - Cold-Formed Metal Framing: Exterior wind-load-bearing metal stud framing and interior load bearing metal stud framing.
- B. Section 07 21 00 - Thermal Insulation.
- C. Section 07 90 05 - Joint Sealers: Acoustic sealant.
- D. Section 09 22 26 - Suspension Systems: Suspended systems to support gypsum board ceilings and soffits.

**1.03 REFERENCE STANDARDS**

- A. ASTM C475/C475M - Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board; 2012.
- B. ASTM C645 - Standard Specification for Nonstructural Steel Framing Members; 2013.
- C. ASTM C665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing; 2012.
- D. ASTM C754 - Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products; 2011.
- E. ASTM C840 - Standard Specification for Application and Finishing of Gypsum Board; 2013.
- F. 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.
- G. 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).
- H. ASTM C1047 - Standard Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base; 2010a.
- I. ASTM C1177/C1177M - Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing; 2013.

- J. ASTM C1280 - Standard Specification for Application of Gypsum Sheathing; 2013.
- K. ASTM C 1278/C 1278M - Standard Specification for Fiber-Reinforced Gypsum Panel; 2006
- L. ASTM C1396/C1396M - Standard Specification for Gypsum Board; 2014.
- M. ASTM C1629/C1629M - Standard Classification for Abuse-Resistant Nondecorated Interior Gypsum Panel Products and Fiber-Reinforced Cement Panels; 2014.
- N. ASTM D3273 - Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber; 2012.
- O. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements; 2009.
- P. ASTM E413 - Classification for Rating Sound Insulation; 2010.
- Q. GA-216 - Application and Finishing of Gypsum Board; Gypsum Association; 2013.

**1.04 SYSTEM DESCRIPTION**

- A. Acoustic Attenuation for Interior Partitions Indicated as Acoustic: STC of 45-49 calculated in accordance with ASTM E 413, based on tests conducted in accordance with ASTM E 90.
- B. Shaft Wall: Configure and install components as required to achieve the following performance levels:
  - 1. Acoustic Attenuation: STC of 35-39 calculated in accordance with ASTM E 413, based on tests conducted in accordance with ASTM E 90.

**1.05 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on metal framing, gypsum board, accessories, and joint finishing system.
- C. Product Data: Provide manufacturer's data on partition head to structure connectors, showing compliance with requirements.
- D. Test Reports: For all stud framing products that do not comply with ASTM C645 or C754, provide independent laboratory reports showing maximum stud heights at required spacings and deflections.
- E. Samples: Submit two samples of gypsum board finished with proposed texture application, 12 by 12 inches in size, illustrating finish color and texture.

**1.06 QUALITY ASSURANCE**

- A. Perform in accordance with ASTM C 840. Comply with requirements of GA-600 for fire-rated assemblies.
- B. Installer Qualifications: Company specializing in performing gypsum board application and finishing, with minimum three years of documented experience.

**1.07 REGULATORY REQUIREMENTS**

- A. Conform to applicable code for fire rated assemblies as indicated on drawings.

**PART 2 PRODUCTS**

**2.01 GYPSUM BOARD ASSEMBLIES**

- A. Provide completed assemblies complying with ASTM C840 and GA-216.
- B. Shaft Walls at HVAC Shafts: Provide completed assemblies with the following characteristics:

1. Air Pressure Within Shaft: Sustained 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.
- C. Shaft Walls at Elevator Shafts: 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.

## 2.02 METAL FRAMING MATERIALS

- A. Non-Loadbearing Framing System Components: ASTM C645; galvanized sheet steel, of size and properties necessary to comply with ASTM C754 for the spacing indicated, with maximum deflection of wall framing of L/240 at 5 psf.
1. Exception: The minimum metal thickness and section properties requirements of ASTM C 645 are waived provided steel of 40 ksi minimum yield strength is used, the metal is continuously dimpled, the effective thickness is at least twice the base metal thickness, and maximum stud heights are determined by testing in accordance with ASTM E 72 using assemblies specified by ASTM C 754.
    - a. Acceptable Products:
      - 1) Dietrich Metal Framing UltraSteel (tm): [www.dietrichindustries.com](http://www.dietrichindustries.com).
      - 2) Clark Western Building Systems UltraSteel (tm): [www.clarkwestern.com](http://www.clarkwestern.com).
  2. Studs: "C" shaped with flat or formed webs with knurled faces; minimum 14 gage at wall-hung toilets, wall-hung urinals, and door jambs; minimum 20 gage at acoustical walls.
  3. Runners: U shaped, sized to match studs.
  4. Z-Furring: Profiles as indicated on Drawings.
  5. Furring: Hat-shaped sections, minimum depth of 7/8 inch.
  6. Resilient Furring Channel and Clip System:
    - a. Products:
      - 1) RSIC-1 by Pac International: [www.pac-intl.com](http://www.pac-intl.com).
      - 2) GenieClip by Pliteq Inc: [www.pliteq.com](http://www.pliteq.com).
      - 3) IsoMax by Kinetics Noise Control: [www.kineticsnoise.com](http://www.kineticsnoise.com).
      - 4) Substitutions: See Section 01 60 00 - Product Requirements.
  7. Sheet Metal Backing: 0.036 inch galvanized steel sheet for supporting wall supported items.
- B. Loadbearing Studs for Application of Gypsum Board: As specified in Section 05 40 00.
- C. Shaft Wall Studs and Accessories: ASTM C645; galvanized sheet steel, of size and properties necessary to comply with ASTM C754 and specified performance requirements.
- D. Partition Head To Structure Connections: Provide track fastened to structure with legs of sufficient length to accommodate deflection, for friction fit of studs cut short and fastened as indicated on drawings.

## 2.03 BOARD MATERIALS

- A. Gypsum Wallboard: Paper-faced gypsum panels as defined in ASTM C1396/C1396M; sizes to minimize joints in place; ends square cut.
1. Application: Use for vertical surfaces and ceilings, unless otherwise indicated.
  2. Thickness:
    - a. Vertical Surfaces: 5/8 inch.
- B. Impact-Resistant Wallboard:
1. Application: All public hallways and corridors.
  2. Surface Abrasion: Level 3, minimum, when tested in accordance with ASTM C1629.
  3. Surface Indentation: Level 1, minimum, when tested in accordance with ASTM C1629/C1629M.
  4. Soft-body Impact: Level 3 when tested in accordance with ASTM C1629/C1629M.

5. Hard-body Impact: Level 2, minimum, when tested in accordance with ASTM C1629/C1629M.
  6. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
  7. Type: Fire-resistance rated Type X, UL or WH listed.
  8. Thickness: 5/8 inch.
  9. Edges: Tapered.
  10. Products:
    - a. American Gypsum; M-Bloc IR Type X.
    - b. Georgia-Pacific Gypsum; DensArmor Plus Impact-Resistant.
    - c. Hi-Impact XP Gypsum Board by National Gypsum: [www.nationalgypsum.com](http://www.nationalgypsum.com).
    - d. Substitutions: See Section 01 60 00 - Product Requirements.
- C. Ceiling Board: Special sag-resistant gypsum ceiling board as defined in ASTM C1396/C1396M; sizes to minimize joints in place; ends square cut.
1. Application: Ceilings, unless otherwise indicated.
  2. Thickness: 5/8 inch.
  3. Edges: Tapered.
- D. Water-Resistant Gypsum Backing Board: ASTM C 1396/C 1396M; ends square cut.
1. Application: Vertical surfaces behind thinset tile, except in wet areas. Backing at wet areas specified in Section 09 30 00.
  2. Core Type: Type X, as indicated.
  3. Thickness: 5/8 inch.
  4. Edges: Tapered.
- E. Exterior Sheathing Board: Sizes to minimize joints in place; ends square cut.
1. Application: Exterior sheathing, unless otherwise indicated.
  2. Glass Mat Faced Sheathing: Glass mat faced gypsum substrate as defined in ASTM C1177/C1177M.
  3. Core Type: Type X, as indicated.
  4. Type X Thickness: 5/8 inch.
  5. Edges: Square, for vertical application.
  6. Glass Mat Faced Products:
    - a. Georgia-Pacific Gypsum; DensGlass Fireguard Sheathing.
    - b. Substitutions: See Section 01 60 00 - Product Requirements.
- F. Exterior Soffit Board: Exterior gypsum soffit board as defined in ASTM C1396/C1396M; sizes to minimize joints in place; ends square cut.
1. Application: Ceilings and soffits in protected exterior areas, unless otherwise indicated.
  2. Types: Type X, in all locations.
  3. Type X Thickness: 5/8 inch.
  4. Edges: Tapered.
  5. Products:
    - a. Georgia-Pacific Gypsum; ToughRock Fireguard C Soffit Board.
    - b. Substitutions: See Section 01 60 00 - Product Requirements.
- G. Gypsum Shaftwall or Coreboard: ASTM C 1396/C 1396M; Type X core; sizes to minimize joints in place; 1 inch thick; square, tongue and groove, or double beveled edges, ends square cut.

#### **2.04 ACCESSORIES**

- A. "F" Reveal Molding: Extruded aluminum, 1/2 inch wide.
  1. FDM-625-50 by Fry Reglet Corporation: [www.fryreglet.com](http://www.fryreglet.com).
  2. Substitutions: Section 01 60 00 - Product Requirements.
- B. Exterior Soffit Vent: Extruded aluminum, 5/5 inch depth; 3 inch wide vent strip.
  1. DCS-625-V-300 by Fry Reglet Corporation: [www.fryreglet.com](http://www.fryreglet.com).
  2. Substitutions: Section 01 60 00 - Product Requirements.
- C. Insulation at Fire-Rated Ceilings: Mineral wool Insulation, 1-1/2 inch thick or as indicated on Drawings.

- D. Acoustic Insulation: ASTM C 665; preformed glass fiber, friction fit type, unfaced. Thickness: 4 and 5 inch. 1.5 - 3.0 lb density.
- E. Acoustic Sealant: As specified in Section 07 90 05.
- F. Gasket Tape: Closed-cell neoprene gasket tape, 1/4 and 3/4 inch thicknesses.
- G. Finishing Accessories: ASTM C1047, galvanized steel or rolled zinc, unless otherwise indicated.
  - 1. Types: Corner, casing, control, "v" joints, or as indicated or needed for finished appearance.
- H. Joint Materials: ASTM C475 and as recommended by gypsum board manufacturer for project conditions.
  - 1. Tape: 2 inch wide, coated glass fiber tape for joints and corners.
  - 2. Ready-mixed vinyl-based joint compound.
- I. Textured Finish Materials: Latex-based compound; plain.
  - 1. Texture: Orange peel.
- J. Screws for Attachment to Steel Members Less Than 0.03 inch In Thickness, to Wood Members, and to Gypsum Board: ASTM C1002; self-piercing tapping type; cadmium-plated for exterior locations.
- K. Screws for Attachment to Steel Members From 0.033 to 0.112 inch in Thickness: ASTM C954; steel drill screws for application of gypsum board to loadbearing steel studs.
- L. Screws: ASTM C 954; steel drill screws for application of gypsum board to loadbearing steel studs.
- M. Anchorage to Substrate: Tie wire, nails, screws, and other metal supports, of type and size to suit application; to 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 studs at spacing required to meet performance requirements.
- B. Shaft Wall Liner: Cut panels to accurate dimension and install sequentially between special friction studs.
  - 1. On walls over sixteen feet high, screw-attach studs to runners top and bottom.
  - 2. Seal perimeter of shaft wall and penetrations with acoustical sealant.

**3.03 FRAMING INSTALLATION**

- A. Metal Framing: Install in accordance with ASTM C754 and manufacturer's instructions.
- B. Studs: Space studs at 16 inches on center or as indicated on Drawings.
  - 1. Extend partition framing to structure where indicated and to ceiling in other locations.
  - 2. Partitions Terminating at Ceiling: Attach ceiling runner securely to ceiling track in accordance with manufacturer's instructions.
  - 3. Partitions Terminating at Structure: Attach extended leg top runner to structure, maintain clearance between top of studs and structure, and brace both flanges of studs with continuous bridging.
- C. Openings: Reinforce openings as required for weight of doors or operable panels, using not less than double studs at jambs.

- D. Acoustic Furring: Install resilient channel and clip system components in accordance with manufacturer's recommendations.
- E. Backing: Install sheet metal backing to support wall supported items; coordinate locations with specific items to be installed.

**3.04 ACOUSTIC ACCESSORIES INSTALLATION**

- A. Acoustic Insulation: Place tightly within spaces, around cut openings, behind and around electrical and mechanical items within partitions, and tight to items passing through partitions.
  - 1. Place in acoustical walls as indicated on Drawings; thickness as indicated.
  - 2. Place in metal deck voids where partitions abut metal decking as indicated on Drawings.
- B. Acoustic Sealant: Install in accordance with manufacturer's instructions.
  - 1. Place two beads continuously on substrate before installation of perimeter framing members.
  - 2. Place continuous bead at perimeter of each layer of gypsum board.
  - 3. In non-fire-rated construction, seal around all penetrations by conduit, pipe, ducts, and rough-in boxes.
  - 4. Apply beads at metal closure plates where walls terminate at metal roof and floor decking.
  - 5. Apply also as indicated on Drawings.

**3.05 BOARD INSTALLATION**

- A. Comply with ASTM C 840 and manufacturer's instructions. Install to minimize butt end joints, especially in highly visible locations.
- B. Fire-Rated Construction: Install gypsum board in strict compliance with requirements of assembly listing.
- C. Exterior Sheathing: Comply with ASTM C1280. Install sheathing vertically, with edges butted tight and ends occurring over firm bearing.
  - 1. Comply with GA-253 and manufacturer's instructions.
  - 2. Secure with self-tapping non-corrosive screws.
- D. Exterior Soffits: Install exterior soffit board perpendicular to framing, with staggered end joints over framing members or other solid backing.
  - 1. Seal joints, cut edges, and holes with water-resistant sealant.
- E. Moisture Protection: Treat cut edges and holes in moisture resistant gypsum board and exterior gypsum soffit board with sealant.

**3.06 INSTALLATION OF TRIM AND ACCESSORIES**

- A. Control Joints: Place control joints consistent with lines of building spaces and as indicated.
- B. Corner Beads: Install at external corners, using longest practical lengths.
- C. Edge Trim: Install at locations where gypsum board abuts dissimilar materials and as indicated.
- D. Reveal Molding: Install as indicated.

**3.07 JOINT TREATMENT**

- A. Finish gypsum board in accordance with levels defined in ASTM C840, as follows:
  - 1. Level 5: Exterior gypsum soffits and interior ceilings to receive semi-gloss or gloss paint finish.
  - 2. Level 4: Walls and ceilings to receive paint finish or wall coverings, unless otherwise indicated.
  - 3. Level 2: In utility areas, behind cabinetry, and on backing board to receive tile finish.
  - 4. Level 1: Fire rated wall areas above finished ceilings, whether or not accessible in the completed construction.

- B. Tape, fill, and sand exposed joints, edges, and corners to produce smooth surface ready to receive finishes.
  - 1. Feather coats of joint compound so that camber is maximum 1/32 inch.
- C. 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 TEXTURE FINISH**

- A. Apply finish texture coating by means of spraying apparatus in accordance with manufacturer's instructions and to match approved sample.

**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**



## SUSPENSION SYSTEMS

### PART 1 GENERAL

#### 1.01 SECTION INCLUDES

- A. Ceiling and soffit suspension system.

#### 1.02 RELATED SECTIONS

- A. Section 01 62 11 - Delegated Design: Additional requirements for design-build systems; regulatory submittals.
- B. Section 06 40 00 - Architectural Woodwork: Wood ceiling panels.
- C. Section 07 90 05 - Joint Sealers
- D. Section 09 21 16 - Gypsum Board Assemblies: Gypsum board finishes; interior framing systems.
- E. Section 09 51 00 - Acoustical Ceilings: Suspension systems for acoustical panel systems.

#### 1.03 REFERENCES

- A. ASCE 7 - Minimum Design Loads for Buildings and Other Structures; 2002.
- B. ASTM C 635 - Standard Specification for the Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings; 2004.
- C. ASTM C 636 - Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels; 2004.
- D. ASTM C 645 - Standard Specification for Nonstructural Steel Framing Members; 2007.
- E. ASTM E 580 - Standard Practice for Application of Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels in Areas Requiring Seismic Restraint; 2002.
- F. CISCA - Acoustical Ceilings: Use and Practice.

#### 1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on suspension system components.
- C. Manufacturer's Installation Instructions: Indicate special procedures.
- D. Regulatory Submittals (Deferred Permit Submittals): Submit design drawings, shop drawings, and calculations for seismic system sealed by a Professional Structural Engineer licensed in Oregon code authority for review and approval.

#### 1.05 QUALITY ASSURANCE

- A. Suspension System Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.
- B. Installer Qualifications: Company specializing in performing the work of this section with minimum three years documented.

#### 1.06 PERFORMANCE REQUIREMENTS

- A. Suspension System: Rigidly secure ceiling and soffit suspension system including integral mechanical and electrical components with maximum deflection of 1:360.
- B. Seismic Standard: Provide acoustical ceiling system designed and installed to withstand effects of earthquake motions according as follows:
  1. Seismic Restraint: ASTM E 580.

2. Comply with CISCA's "Guidelines for Seismic Restraint of Direct-Hung Suspended Ceiling Assemblies - Seismic Zones 3 & 4.
3. Oregon Structural Specialty Code.
4. Comply with ASCE 7-02 Seismic Design Category D.

## **PART 2 PRODUCTS**

### **2.01 CEILING AND SOFFIT SUSPENSION SYSTEM**

- A. Suspension Systems - General: ASTM C635, die-cut and interlocking components, with stabilizer bars, clips, splices, perimeter moldings as required.
- B. Concealed Steel Suspension System: Formed steel, commercial quality cold rolled; heavy-duty; galvanized.
  1. Profile: Tee; 1-1/2 inch face width.
  2. Construction Double web.
  3. Molding: Angle and channel molding standard with system.
  4. Finish: Galvanize to G40.
  5. Products:
    - a. Drywall Grid by Armstrong World Industries: [www.armstrong.com](http://www.armstrong.com).
    - b. Rigid X System by United States Gypsum Co: [www.usg.com](http://www.usg.com).
    - c. Substitutions: Section 01 60 00 - Product Requirements.
- C. Z-Furring: Galvanized steel, depth as indicated on Drawings.

### **2.02 ACCESSORIES**

- A. Support Channels and Hangers: Galvanized steel; size and type to suit application, seismic requirements, and ceiling system flatness requirement specified.
- B. Perimeter Moldings: Same material and finish as grid.
  1. At Concealed Grid: Provide exposed L-shaped molding.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify existing conditions before starting work.
- B. Verify that layout of hangers will not interfere with other work.

### **3.02 ERECTION - CEILING AND SOFFIT SUSPENSION SYSTEM**

- A. Install suspension system in accordance with manufacturer's recommendations and as supplemented in this section.
  1. Install system in accordance with ASTM E 580, Oregon Structural Specialty Code for seismic restraint, and CISCA's "Guidelines for Seismic Restraint of Direct-Hung Suspended Ceiling Assemblies - Seismic Zones 3 & 4
- 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 location of hangers with other work.
- D. Hang suspension system independent of walls, columns, ducts, pipes and conduit.
- E. Where ducts or other equipment prevent regular spacing of hangers, reinforce nearest affected hangers and related carrying channels to span extra distance.
- F. Do not support components on main runners or cross runners when weight causes total dead load to exceed deflection capability. Support fixture loads by supplementary hangers.
- G. Do not eccentrically load system, or produce rotation of runners.

**3.03 ERECTION TOLERANCES**

- A. Maximum Variation From True Position: 1/8 inch in 10 feet.
- B. Maximum Variation From Plumb: 1/8 inch in 10 feet.

**END OF SECTION**

## TILING

### PART 1 GENERAL

#### 1.01 SECTION INCLUDES

- A. Tile for floor applications.
- B. Tile for wall applications.
- C. Coated glass mat backer board as tile substrate.
- D. Ceramic accessories.
- E. Non-ceramic trim.
- F. Installation of Owner furnished tiles.

#### 1.02 RELATED REQUIREMENTS

- A. Section 01 10 00 - Summary: Description of Owner Furnished Contractor Installed tile.
- B. Section 03 30 00 - Cast-In-Place Concrete: Floor substrate.
- C. Section 09 21 16 - Gypsum Board Assemblies: Interior metal wall framing.

#### 1.03 REFERENCE STANDARDS

- A. ANSI A108/A118/A136.1 - American National Standard Specifications for the Installation of Ceramic Tile - Version; 2013.1.
- B. ANSI A108.1A - American National Standard Specifications for Installation of Ceramic Tile in the Wet-Set Method, with Portland Cement Mortar; 2013.1.
- C. ANSI A108.1B - American National Standard Specifications for Installation of Ceramic Tile on a Cured Portland Cement Mortar Setting Bed with Dry-Set or Latex-Portland Cement Mortar; 2013.1.
- D. ANSI A108.1C - Specifications for Contractors Option: Installation of Ceramic Tile in the Wet-Set Method with Portland Cement Mortar or Installation of Ceramic Tile on a Cured Portland Cement Mortar Bed with Dry-Set or Latex-Portland Cement Mortar; 2013.1.
- E. ANSI A108.4 - American National Standard Specifications for Installation of Ceramic Tile with Organic Adhesives or Water Cleanable Tile-Setting Epoxy Adhesive; 2013.1.
- F. ANSI A108.5 - American National Standard Specifications for Installation of Ceramic Tile with Dry-Set Portland Cement Mortar or Latex-Portland Cement Mortar; 2013.1.
- G. ANSI A108.6 - American National Standard Specifications for Installation of Ceramic Tile with Chemical Resistant, Water Cleanable Tile-Setting and -Grouting Epoxy; 2013.1.
- H. ANSI A108.8 - American National Standard Specifications for Installation of Ceramic Tile with Chemical Resistant Furan Resin Mortar and Grout; 2013.1.
- I. ANSI A108.9 - American National Standard Specifications for Installation of Ceramic Tile with Modified Epoxy Emulsion Mortar/Grout; 2013.1.
- J. ANSI A108.10 - American National Standard Specifications for Installation of Grout in Tilework; 2013.1.
- K. ANSI A108.11 - American National Standard Specifications for Interior Installation of Cementitious Backer Units; 2013.1.
- L. ANSI A118.3 - American National Standard Specifications for Chemical Resistant, Water Cleanable Tile-Setting and -Grouting Epoxy and Water Cleanable Tile-Setting Epoxy Adhesive; 2013.1.

- M. ANSI A118.6 - American National Standard Specifications for Standard Cement Grouts for Tile Installation; 2013.1.
- N. ANSI A137.1 - American National Standard Specifications for Ceramic Tile - Version; 2013.1.
- O. ASTM C1178/C1178M - Standard Specification for Coated Glass Mat Water-Resistant Gypsum Backing Panel; 2013.
- P. ASTM C 1288 - Standard Specification for Discrete Non-Asbestos Fiber-Cement Interior Substrate Sheets; 1999.
- Q. TCNA (HB) - Handbook for Ceramic, Glass, and Stone Tile Installation - Version; 2013.1.

#### **1.04 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide manufacturers' data sheets on tile, mortar, grout, and accessories. Include instructions for using grouts and adhesives.
- C. Shop Drawings: Indicate tile layout, patterns, color arrangement, perimeter conditions, junctions with dissimilar materials, control and expansion joints, thresholds, ceramic accessories, and setting details.
- D. Samples: Mount tile and apply grout on two plywood panels, minimum 18 x 18 inches in size illustrating pattern, color variations, and grout joint size variations.
- E. Maintenance Data: Include recommended cleaning methods, cleaning materials, stain removal methods, and polishes and waxes.

#### **1.05 QUALITY ASSURANCE**

- A. Maintain one copy of and ANSI A108/A118/A136.1 and TCNA (HB) on site.
- B. Manufacturer Qualifications: Company specializing in manufacturing the types of products specified in this section, with minimum five years of documented experience.
- C. Installer Qualifications: Company specializing in performing tile installation, with minimum of five years of documented experience.

#### **1.06 MOCK-UP**

- A. See Section 01 40 00 - Quality Requirements, for general requirements for mock-up.
- B. Construct tile mock-up where indicated on the drawings, incorporating all components specified for the location.
  1. One complete toilet room wall as directed by Architect.
  2. Approved mock-up may remain as part of the Work.

#### **1.07 PRE-INSTALLATION MEETING**

- A. Convene one week before starting work of this section.

#### **1.08 DELIVERY, STORAGE, AND HANDLING**

- A. Protect adhesives from freezing or overheating in accordance with manufacturer's instructions.

#### **1.09 FIELD CONDITIONS**

- A. Maintain ambient and substrate temperature of 50 degrees F during installation of mortar materials.

#### **1.10 EXTRA MATERIALS**

- A. Provide 1 percent of each size, color, and surface finish of tile specified.

**PART 2 PRODUCTS****2.01 TILE**

- A. Glazed Ceramic Wall Tile Type CT-1: ANSI A137.1, and as follows:
  - 1. Moisture Absorption: 0 to 0.5 percent.
  - 2. Field Tile Size and Shape: 4-1/4 x 12-7/8.
  - 3. Bullnose Trim Size: 4-1/4 x 12-3/4.
  - 4. Cove Base Size: 4-1/4 x 12-3/4.
  - 5. Edges: Cushioned.
  - 6. Surface Finish: Semi-gloss.
  - 7. Color(s): Arctic White (I) 0190.
  - 8. Products:
    - a. Modern Dimensions by Dal-Tile Corporation: [www.daltile.com](http://www.daltile.com).
    - b. Substitutions: See Section 01 60 00 - Product Requirements.
  
- B. Quarry Tile Type QT: ANSI A137.1, and as follows:
  - 1. Moisture Absorption: 0.5 to 3.0 percent.
  - 2. Size and Shape: 6 inch square.
  - 3. Thickness: 1/2 inch.
  - 4. Edges: Cushioned.
  - 5. Surface Finish: Non-slip.
  - 6. Color: Dal-Tile Arid Gray.
  - 7. Trim Units: Matching bullnose and cove base shapes in sizes coordinated with field tile.
  - 8. Products:
    - a. Quarry Tile by Dal-Tile: [www.dal-tile.com](http://www.dal-tile.com).
    - b. Substitutions: See Section 01 60 00 - Product Requirements.
  
- C. Porcelain Floor Tile Type CT-2: ANSI A137.1, and as follows:
  - 1. Moisture Absorption: 0 to 0.5 percent.
  - 2. Size and Shape: Hexagon, 20-3/4 x 24 inches.
  - 3. Thickness: 3/8 inch, minimum.
  - 4. Face: Plain.
  - 5. Edges: Cushioned.
  - 6. Surface Finish: Non-slip.
  - 7. Color(s): Steel Grey Matte.
  - 8. Products:
    - a. PARC Series Porcelain Tile by Pental Granite & Marble: [www.pentalonline.com](http://www.pentalonline.com).
    - b. Substitutions: See Section 01 60 00 - Product Requirements.
  
- D. Owner Furnished Tile: Glass art wall tile.
  - 1. Sizes: 8 x 6 inch, 8 x 8 inch, and 6 x 8 inch as indicated on Drawings.
  - 2. Thickness: 1/4 inch.
  - 3. Total Units: Refer to Architectural Interior Elevations for locations and quantity.

**2.02 TRIM AND ACCESSORIES**

- A. Non-Ceramic Trim: Brushed stainless steel, style and dimensions to suit application, for setting using tile mortar or adhesive.
  - 1. Applications:
    - a. Open edges of floor tile.
    - b. Transition between floor finishes of different heights.
    - c. Thresholds at door openings.
    - d. Expansion and control joints, floor and wall.
    - e. Floor to wall joints.
    - f. Borders and other trim as indicated on drawings.
  - 2. Manufacturers:
    - a. Schluter-Systems: [www.schluter.com](http://www.schluter.com).
    - b. Genesis APS International: [www.genesis-aps.com](http://www.genesis-aps.com).

- c. Substitutions: See Section 01 60 00 - Product Requirements.

### **2.03 SETTING MATERIALS**

- A. Mortar Bed Materials: Pre-packaged mix of Portland cement, sand, latex additive, and water.

### **2.04 MORTAR MATERIALS**

### **2.05 GROUTS**

- A. Standard Grout: ANSI A118.6 standard cement grout.
  1. Applications: Use this type of grout where indicated and where no other type of grout is indicated.
  2. Use sanded grout for joints 1/8 inch wide and larger; use unsanded grout for joints less than 1/8 inch wide.
  3. Color(s): As selected.
- B. Epoxy Grout: ANSI A118.3 chemical resistant and water-cleanable epoxy grout.
  1. Applications: Kitchen.

### **2.06 ACCESSORY MATERIALS**

- A. Stain-Resistant Grout Additive: Stain-resistant, mold and mildew-resistant; replaces water in portland cement grout mix.
  1. Grout Boost Advanced Pro by H.B. Fuller Construction Products, Inc: [www.groutboost.com](http://www.groutboost.com).
  2. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Waterproofing Membrane at Showers : PVC sheet membrane, 40 mils thick, minimum; specifically designed for bonding to cementitious substrate under thick mortar bed or thin-set tile; complying with ANSI A118.10.
  1. Products:
    - a. Composeal Blue Shower Pan by Compotite Corporation; Composeal Blue Shower Pan: [www.compotite.com](http://www.compotite.com).
    - b. Substitutions: See Section 01 60 00 - Product Requirements.
- C. Backer Board: Coated glass mat type complying with ASTM C1178/C1178M; inorganic fiberglass mat on both surfaces and integral acrylic coating vapor retarder.
  1. Fire-Resistant Type: Type X core, thickness 5/8 inch.
- D. Relief Joints: Rigid PVC, 3/8 inch wide.
  1. DILEX-BWB by Schluter Systems: [www.schluter.com](http://www.schluter.com).
  2. Substitutions: See Section 01 60 00 - Product Requirements.
- E. Mesh Tape: 2-inch wide self-adhesive fiberglass mesh tape.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify that sub-floor surfaces are smooth and flat within the tolerances specified for that type of work and are ready to receive tile.
- B. Verify that wall surfaces are smooth and flat within the tolerances specified for that type of work, are dust-free, and are ready to receive tile.
- C. Verify that sub-floor surfaces are dust-free and free of substances that could impair bonding of setting materials to sub-floor surfaces.
- D. Verify that concrete sub-floor surfaces are ready for tile installation by testing for moisture emission rate and alkalinity; obtain instructions if test results are not within limits recommended by tile manufacturer and setting materials manufacturer.
- E. Verify that required floor-mounted utilities are in correct location.

**3.02 PREPARATION**

- A. Protect surrounding work from damage.
- B. Vacuum clean surfaces and damp clean.
- C. Seal substrate surface cracks with filler. Level existing substrate surfaces to acceptable flatness tolerances.
- D. Install backer board in accordance with ANSI A108.11 and board manufacturer's instructions. Tape joints and corners, cover with skim coat of setting material to a feather edge.
- E. Prepare substrate surfaces for adhesive installation in accordance with adhesive manufacturer's instructions.

**3.03 INSTALLATION - GENERAL**

- A. Install tile and thresholds, nosings and grout in accordance with applicable requirements of ANSI A108.1 through A108.13, manufacturer's instructions, and TCA Handbook recommendations. Install metal tread nosings in accordance with manufacturer's instructions.
- B. Lay tile to pattern indicated. Do not interrupt tile pattern through openings.
- C. Cut and fit tile to penetrations through tile, leaving sealant joint space. Form corners and bases neatly. Align floor joints.
- D. Place tile joints uniform in width, subject to variance in tolerance allowed in tile size. Make grout joints without voids, cracks, excess mortar or excess grout, or too little grout.
- E. Form internal angles coved and external angles bullnosed.
- F. Install non-ceramic trim in accordance with manufacturer's instructions.
- G. Install thresholds where indicated.
- H. Sound tile after setting. Replace hollow sounding units.
- I. Keep control and expansion joints free of mortar, grout, and adhesive.
- J. Prior to grouting, allow installation to completely cure; minimum of 48 hours.
- K. Grout tile joints unless otherwise indicated. Use standard grout unless otherwise indicated. Use epoxy grout at Showers and Kitchen.
- L. At changes in plane and tight-to-tile control joints, use tile sealant instead of grout, with either bond breaker tape or backer rod as appropriate to prevent three-sided bonding.

**3.04 INSTALLATION - FLOORS - MORTAR BED METHODS**

- A. Showers: Over interior concrete substrate, install in accordance with TCA Handbook Method B414-05.
- B. Floors: Over interior concrete substrates, install in accordance with TCA Handbook Method F111, with cleavage membrane .
  - 1. Where waterproofing membrane is indicated, with standard grout or no mention of grout type, install in accordance with TCNA (HB) Method F121.
- C. Cleavage Membrane: Lap edges and ends.
- D. Waterproofing Membrane: Install as recommended by manufacturer and as specified in the section in which the product is specified.
- E. Mortar Bed Thickness: 1-1/4 inch, unless otherwise indicated.
- F. Seal joints between tile work and other work with silicone sealant specified in Section 07 90 05.



**3.05 INSTALLATION - SHOWER RECEPTOR AND WALLS**

- A. At tiled shower receptors install in accordance with TCNA (HB) Method B420, mortar bed floor, and W245, thin-set over coated glass mat backer board walls.
- B. Grout with epoxy grout.

**3.06 INSTALLATION - WALL TILE**

- A. Over coated glass mat backer board on studs, install in accordance with TCNA (HB) Method W245.

**3.07 CLEANING**

- A. Clean tile and grout surfaces.

**3.08 PROTECTION**

- A. Do not permit traffic over finished floor surface for 4 days after installation.

**END OF SECTION**

## ACOUSTICAL CEILINGS

### PART 1 GENERAL

#### 1.01 SECTION INCLUDES

- A. Suspended metal grid ceiling system.
- B. Acoustical units.
- C. Glue applied acoustical panels.
- D. Supplementary acoustical insulation behind perforated wood panels and ceilings and walls.

#### 1.02 RELATED REQUIREMENTS

- A. Section 01 62 11 - Delegated Design: Additional requirements for design-build systems; regulatory submittals..
- B. Section 07 90 05 - Joint Sealers: Acoustical sealant.
- C. Section 08 31 00 - Access Doors and Panels: Access panels.
- D. Section 10 21 23 - Cubicles: Ceiling mounted cubicle curtain tracks and curtains.
- E. Section 28 30 00 - Fire Detection and Alarm: Fire alarm components in ceiling system
- F. Section 21 10 00 - Water Based Fire Suppression Sprinklers: Sprinkler heads in ceiling system.
- G. Section 23 37 00 - Air Outlets and Inlets: Air diffusion devices in ceiling.
- H. Section 26 50 00 - Lighting: Light fixtures in ceiling system.
- I. Section 27 51 13 - Paging: Speakers in ceiling system.

#### 1.03 REFERENCE STANDARDS

- A. ASCE 7 - Minimum Design Loads for Buildings and Other Structures; 2002.
- B. ASTM C635/C635M - Standard Specification for the Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings; 2013a.
- C. ASTM C1071 - Standard Specification for Fibrous Glass Duct Lining Insulation (Thermal and Sound Absorbing Material).
- D. ASTM E1264 - Standard Classification for Acoustical Ceiling Products; 2008e1.
- E. CISCA - Acoustical Ceilings: Use and Practice.

#### 1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on suspension system components.
- C. Samples: Submit two samples 6 x 6 inch in size illustrating material and finish of acoustical units.
- D. Samples: Submit two samples each, 12 inch (300 mm) long, of suspension system main runner, cross runner, and perimeter molding.
- E. Manufacturer's Installation Instructions: Indicate special procedures.
- F. Regulatory Submittals (Deferred Permit Submittals): Submit design drawings, shop drawings, and calculations for seismic system sealed by a Professional Structural Engineer licensed in Oregon code authority for review and approval.

**1.05 QUALITY ASSURANCE**

- A. Suspension System Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.
- B. Acoustical Unit Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.
- C. Installer Qualifications: Company specializing in performing the work of this section with minimum three years documented.

**1.06 PERFORMANCE REQUIREMENTS**

- A. Suspension System: Rigidly secure ceiling system including integral mechanical and electrical components with maximum deflection of 1:360.
- B. Seismic Standard: Provide acoustical ceiling system designed and installed to withstand effects of earthquake motions according as follows:
  1. Seismic Restraint: ASTM E 580.
  2. Comply with CISCA's "Guidelines for Seismic Restraint of Direct-Hung Suspended Ceiling Assemblies - Seismic Zones 3 & 4.
  3. Oregon Structural Specialty Code.
  4. Comply with ASCE 7-02 Seismic Design Category D.

**1.07 FIELD CONDITIONS**

- A. Maintain uniform temperature of minimum 60 degrees F, and maximum humidity of 40 percent prior to, during, and after acoustical unit installation.

**1.08 PROJECT CONDITIONS**

- 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. Install acoustical units after interior wet work is dry.

**1.09 EXTRA MATERIALS**

- A. See Section 01 60 00 - Product Requirements, for additional provisions.
- B. Provide 100 sq ft of each type of acoustical unit for Owner's use in maintenance of project.

**PART 2 PRODUCTS****2.01 ACOUSTICAL UNITS**

- A. Acoustical Units - General: ASTM E1264, Class A.
- B. Acoustical Panels Type AP-1: Painted mineral fiber, ASTM E 1264 Type IV, Form 2, Pattern E, with the following characteristics:
  1. Size: 24 x 48 inches.
  2. Thickness: 3/4 inches.
  3. Composition: Wet felted.
  4. Light Reflectance: 0.90 percent, determined as specified in ASTM E 1264.
  5. NRC Rating: 0.70, determined as specified in ASTM E 1264.
  6. Ceiling Attenuation Class (CAC): 35, determined as specified in ASTM E 1264.
  7. Edge: Tegular.
  8. Surface Color: White.
  9. Surface Pattern: Fine texture.
  10. Suspension System: Exposed grid Type 1.
  11. Product:

- a. Ultima Lay-In and Tegular 1986 by Armstrong World Industries Inc:  
www.armstrong.com/ceilings.
  - b. Substitutions: Section 01 60 00 - Product Requirements.
- C. Acoustical Panels Type AP-2: Vinyl faced mineral fiber, ASTM E1264 Type IV, Form 2, Pattern E, with the following characteristics:
- 1. Size: 24 x 48 inches.
  - 2. Thickness: 5/8 inches.
  - 3. Composition: Wet felted.
  - 4. Light Reflectance: 0.80 percent, determined in accordance with ASTM E1264.
  - 5. Ceiling Attenuation Class (CAC): 40, determined in accordance with ASTM E1264.
  - 6. Edge: Square.
  - 7. Surface Color: White.
  - 8. Surface Pattern: Unperforated scrubbable finish.
  - 9. Suspension System: Exposed grid Type 2.
  - 10. Product:
    - a. Clean Room VL by Armstrong World Industries Inc: www.armstrong.com/ceilings.
    - b. Substitutions: Section 01 60 00 - Product Requirements.
- D. Acoustical Foam Panels Type AP-3: Acoustic foam panel with textured surface; Class A flame spread rated.
- 1. Panel Size: 24 x 48 inches; cut to fit between structure.
  - 2. Thickness: 1-7/8 inches.
  - 3. NRC Rating: 0.95 per ASTM C423.
  - 4. Surface Finish: HPC-coated.
  - 5. Color: White.
  - 6. Attachment: Glue applied.
  - 7. Product:
    - a. Sonex Valueline Panels by Pinta Acoustic: www.pinta-acoustic.com.
    - b. Substitutions: See Section 01 60 00 - Product Requirements.

## 2.02 SUSPENSION SYSTEM(S)

- A. Suspension Systems - General: Complying with ASTM C635/C635M; die cut and interlocking components, with stabilizer bars, clips, splices, perimeter moldings, and hold down clips as required. Provide additional supports for ceiling mounted components as specified and indicated on Drawings.
- B. Exposed Steel Suspension System Type 1: Formed steel, commercial quality cold rolled; heavy-duty; galvanized.
- 1. Profile: Tee; 9/16 inch wide face.
  - 2. Construction: Double web.
  - 3. Finish: White painted.
  - 4. Product:
    - a. Suprafine XL by Armstrong World Industries, Inc: www.armstrong.com.
    - b. Substitutions: See Section 01 60 00 - Product Requirements.
- C. Exposed Steel Suspension System Type 2: Formed steel, commercial quality cold rolled; intermediate-duty.
- 1. Profile: Tee; 15/16 inch wide face.
  - 2. Construction: Double web.
  - 3. Finish: White painted.
  - 4. Product:
    - a. Prelude XL by [Armstrong World Industries, Inc: www.armstrong.com.
    - b. Substitutions: See Section 01 60 00 - Product Requirements.

## 2.03 ACCESSORIES

- A. Support Channels and Hangers: Galvanized steel; size and type to suit application, seismic requirements, and ceiling system flatness requirement specified.

- B. Perimeter Moldings: Same material and finish as grid.
  - 1. At Exposed Grid at Walls: Provide reveal molding as indicated on Drawings.
- C. Hold-Down Clips: Manufacturer's standard retention clip; at ACT-2 ceilings.
- D. Acoustic Board Insulation Panels (at perforated wood wall and ceiling panels): Rigid fiberglass; ASTM C1071, Type II:
  - 1. Thickness: 2 inch.
  - 2. Density: 1.5 to 3 pcf.
  - 3. NRC: 0.65 to 0.75, determined as specified in ASTM E 1264.
  - 4. Color: Black (No exposed labels or marking).
  - 5. Product:
    - a. Fiberglas Duct Liner Board by Owens-Corning Fiberglas: [www.owenscorning.com](http://www.owenscorning.com).
    - b. ToughGard Rigid Liner Board by CertainTeed Corp: [www.certainteed.com](http://www.certainteed.com).
    - c. Permacote Linacoustic R-300 by Johns Manville: [www.jm.com](http://www.jm.com).
    - d. Substitutions: See Section 01 60 00 - Product Requirements.
- E. Acoustical Sealant For Perimeter Moldings: Specified in Section 07 90 05.
- F. Adhesive: Recommended by panel manufacturer for substrate.
- G. Touch-up Paint: Type and color to match acoustical and grid units.

### **PART 3 EXECUTION**

#### **3.01 EXAMINATION**

- A. Verify existing conditions before starting work.
- B. Verify that layout of hangers will not interfere with other work.

#### **3.02 INSTALLATION - SUSPENSION SYSTEM**

- A. Install suspension system in accordance with ASTM C 636, ASTM E 580, and manufacturer's instructions, Oregon Structural Specialty Code for seismic restraint, and CISCA's "Guidelines for Seismic Restraint of Direct-Hung Suspended Ceiling Assemblies - Seismic Zones 3 & 4, and as supplemented in this section.
- B. Rigidly secure system, including integral mechanical and electrical components, for maximum deflection of 1:360.
- C. Lay out system to a balanced grid design with edge units no less than 50 percent of acoustical unit size.
- D. Install after major above-ceiling work is complete. Coordinate the location of hangers with other work.
- E. Provide hanger clips during steel deck erection. Provide additional hangers and inserts as required.
- F. Hang suspension system independent of walls, columns, ducts, pipes and conduit. Where carrying members are spliced, avoid visible displacement of face plane of adjacent members.
- 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.
- 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.
- 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 and rivet corners.

### **3.03 INSTALLATION - ACOUSTICAL UNITS**

- A. Install acoustical units in accordance with manufacturer's instructions.
- B. Fit acoustical units in place, free from damaged edges or other defects detrimental to appearance and function.
- C. Lay directional patterned units with pattern parallel to longest room axis.
- D. Fit border trim neatly against abutting surfaces.
- E. Install fascia trim where ceilings do not abut walls.
- F. Install units after above-ceiling work is complete.
- G. Install acoustical units level, in uniform plane, and free from twist, warp, and dents.
- H. Cutting Acoustical Units:
  - 1. Cut to fit irregular grid and perimeter edge trim.
  - 2. Make field cut edges of same profile as factory edges.
  - 3. Double cut and field paint exposed reveal edges.
- I. Where round obstructions occur, provide preformed closures to match perimeter molding.
- J. Install hold-down clips on panels within 20 ft of an exterior door.
- K.

### **3.04 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.

**END OF SECTION**

**WOOD ATHLETIC FLOORING****PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Wood strip flooring, nailed.
- B. Secondary subflooring.
- C. Cushion blocks.
- D. Sheet vapor retarder.
- E. Surface finishing and game markings.

**1.02 RELATED SECTIONS**

- A. Section 03 33 00 - Cast-In-Place Concrete: Recessed concrete subfloor surface and formed depressions for deep floor sockets.
- B. Section 11 66 23 - Gymnasium Equipment: Floor mounting devices.

**1.03 REFERENCES**

- A. MFMA (SPEC) - Guide Specifications for Maple Flooring Systems; Maple Flooring Manufacturers Association; current edition.
- B. NOFMA (IN) - Installing Hardwood Flooring; National Oak Flooring Manufacturers Association; current edition located at [www.nofma.org](http://www.nofma.org).

**1.04 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data for flooring.
- C. Shop Drawings: Indicate floor joint pattern and termination details.
  - 1. Indicate provisions for expansion and contraction.
  - 2. Indicate location, size, design, and color of game markings.
- D. Samples: Submit two samples 3 x 12 inch in size illustrating floor finish, color, and sheen.
- E. Installation Instructions: Indicate standard and special installation procedures.
- F. Maintenance Data: Include maintenance procedures.

**1.05 QUALITY ASSURANCE**

- A. Perform work of this section in accordance with MFMA (SPEC).
- B. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with minimum five years documented experience.
- C. Installer Qualifications: Company specializing in performing work of this section with minimum five years experience.

**1.06 ENVIRONMENTAL REQUIREMENTS**

- A. Do not install wood flooring until wet construction work is complete and ambient air at installation space has moisture content stabilized at maximum moisture content of 40 percent.
- B. Provide heat, light, and ventilation prior to installation.
- C. Store materials in area of installation for minimum period of 24 hours prior to installation.
- D. Maintain minimum room temperature of 65 degrees F for a period of two days prior to delivery of materials to installation space, during installation, and after installation.

**1.07 EXTRA MATERIALS**

- A. See Section 01 60 00 - Product Requirements, for additional provisions.
- B. Supply 10 square yards of extra wood flooring material.

**PART 2 PRODUCTS****2.01 MANUFACTURERS**

- A. Hardwood Flooring:
  1. Action Floor Systems, LLC: [www.actionfloors.com](http://www.actionfloors.com).
  2. Aacer Flooring: [www.aacerflooring.com](http://www.aacerflooring.com).
  3. Connor Sports, Inc: [www.connorsports.com](http://www.connorsports.com).
  4. Horner Sports Floor Systems: [www.hornerflooring.com](http://www.hornerflooring.com).
  5. Robbins Sport Surfaces: [www.robbinsfloor.com](http://www.robbinsfloor.com).
  6. Substitutions: Section 01 60 00 - Product Requirements.

**2.02 MATERIALS**

- A. Wood Strip Flooring :
  1. Species: Northern Hard Maple.
  2. Grade: Second and better.
  3. Cut: Flat grain.
  4. Moisture Content: 6 to 9 percent.
  5. Actual Thickness: 33/32 inch.
  6. Actual Width: 2-1/4 inches.
  7. Edge: Square.
  8. End: End matched.
  9. Length: Random, minimum of 9 inches.
  10. Treatment: Woodlife 3 preservative treatment.
- B. Secondary Subflooring: 15/32 inch thick plywood, APA Rated Sheathing, Span Rating of 32/16 with square edges; Exposure 1, sanded.
- C. Vapor Retarder: Black polyethylene sheet, 8 mil thick; 2 inch wide tape for joint sealing.
- D. Sheathing Paper: Plain building paper.

**2.03 ACCESSORIES**

- A. Ventilating Base: Molded rubber, 4 inch high with a 3 inch toe, ventilating type, with adhesives and accessories, color as selected.
- B. Cushion Blocks: Resilient pads, rubber material, sealed air channels for resiliency; compressible to 1/16 inch under a 40 psi load with full and immediate recovery; round or rectangular shaped, 3/4 inch nominal height.
  1. AacerFlex by Aacer Flooring, LLC.
  2. ProAction Thrust by Action Floor Systems, LLC.
  3. NeoShok by Connor Sports, Inc.
  4. SAFE Pad by Horner Sports Floor Systems.
  5. Bio-Pad by Robbins Sports Surfaces.
  6. Substitutions: Section 01 60 00 - Product Requirements.
- C. Thresholds/Plates:
  1. At Doors: As specified in Section 08 71 00 - Door Hardware.
  2. At Other Locations: Extruded aluminum plate with non-slip top surface; eased edges; counter-sunk screws.
- D. Transition Strip: Same species and finish as flooring material; profiles indicated.
- E. Floor Finish: Low VOC solvent based urethane finish system consisting of two coats primer/sealer and three finish coats.



1. Pro Primer II and Pro 50V Finish by Hillyard: [www.hillard.com](http://www.hillard.com).
  2. Substitutions: Section 01 60 00 - Product Requirements.
- F. Marking Paint: High pigment enamel compatible with floor finish system; colors as scheduled.
1. 1Shot by by Matthews Paint: [www.1shot.com](http://www.1shot.com).
  2. Substitutions: Section 01 60 00 - Product Requirements.
- G. Fasteners: Compatible with floor system, base and wall substrate; corrosion-resistant.
- H. Flooring Nails: Type recommended by flooring manufacturer, hardened steel barbed type for use with power driver, corrosion-resistant.

#### **2.04 SOURCE QUALITY CONTROL**

- A. Inspect and stamp species and grade on underside of each piece of wood flooring at factory.

### **PART 3 EXECUTION**

#### **3.01 EXAMINATION**

- A. Verify existing conditions before starting work.
- B. Verify that concrete subfloor surface is smooth and flat to plus or minus 1/4 inch in 10 feet.
- C. Verify that required floor-mounted utilities are in correct location.

#### **3.02 PREPARATION**

- A. Broom clean substrate surfaces.

#### **3.03 INSTALLATION - SUBFLOOR SYSTEM**

- A. Secondary Subflooring System:
1. Secure cushion blocks to the underside of the first layer of subflooring, locate cushions at 12 inches on center, 32 per 48 x 96 inch sheet, and at 6 inches from edges on all sides. Install parallel to finish flooring with 1/4 inch spacing at panel joints, stagger end joints 48 inches. Provide 1-1/2 inch expansion void at perimeter and vertical obstructions.
  2. Install second layer of subflooring diagonal to first layer with 1/4 inch spacing at panel joints, stagger end joints 48 inches. Secure with galvanized nails or staples spaced 12 inches on center each way. Ensure that joints in layers do not coincide.
- B. Prepare substrate to receive wood flooring in accordance with manufacturer's, MFMA, and NOFMA instructions.
- C. Broom clean substrate.

#### **3.04 INSTALLATION - FINISH FLOORING**

- A. Install base at floor perimeter to cover expansion space in accordance with manufacturer's instructions. Miter inside and outside corners.
- B. Install floor sockets to a depth sufficient to ensure flush top surface with floor surface.
- C. Install thresholds at door openings and where flooring terminates with other floor finishes.

#### **3.05 FINISHING**

- A. Take special measures to assure proper ventilation and handling of products. Maintain controls until finish has cured and fumes have completely dissipated.
- B. Mask off adjacent surfaces before beginning sanding.
- C. Sand flooring to smooth even finish with no evidence of sander marks. Take precautions to contain dust. Remove dust by vacuum.
- D. Apply finish in accordance with floor finish manufacturer's instructions.

- E. Apply two coats of sealer-primer, burnish and tack rag between coats. Vacuum clean and wipe with damp cloth before applying succeeding coat.
- F. Apply colored game lines 2 inches wide to layout indicated on drawings. Apply markings in two coats.
  - 1. Red: To match 1Shot color, 3005 Bright Red
  - 2. Yellow: To match 1Shot color, 3002 Chrome Yellow
  - 3. Light Blue: To match 1Shot color, 3009 Light Blue
  - 4. Dark Blue: To match 1Shot color, 3016 Ultra Blue
  - 5. Brown: To match 1Shot color, 3014 Brown
  - 6. Full paint at basketball key (free throw lane) for both gymnasiums.
  - 7. Graphic at center circle for both gymnasiums.
    - a. To match graphic supplied by Owner.
- G. Apply three coats of finish; sand and tack rag between coats.

**3.06 CLEANING**

- A. Clean and polish floor surfaces in accordance with manufacturer's instructions.

**3.07 PROTECTION**

- A. Prohibit traffic on floor finish for 48 hours after installation.
- B. Place protective coverings over finished floors; do not remove coverings until Substantial Completion.

**END OF SECTION**

**RESILIENT FLOORING****PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Resilient base.
- B. Installation accessories.

**1.02 RELATED REQUIREMENTS**

- A. Section 04 27 31 - Reinforced Unit Masonry: Masonry substrate.
- B. Section 09 21 16 - Gypsum Board Assemblies: Gypsum board wall substrate.

**1.03 REFERENCE STANDARDS**

- A. ASTM F1861 - Standard Specification for Resilient Wall Base; 2008 (Reapproved 2012).
- B. RFCI (RWP) - Recommended Work Practices for Removal of Resilient Floor Coverings; Resilient Floor Covering Institute; October 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. Verification Samples: Submit two samples, 2 x 2 inch in size illustrating color and pattern for each resilient flooring product specified.
- D. Maintenance Data: Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning, stripping, and re-waxing.

**1.05 DELIVERY, STORAGE, AND HANDLING**

- A. Protect roll materials from damage by storing on end.

**1.06 FIELD CONDITIONS**

- A. Store materials for not less than 48 hours prior to installation in area of installation at a temperature of 70 degrees F to achieve temperature stability. Thereafter, maintain conditions above 55 degrees F.

**1.07 EXTRA MATERIALS**

- A. See Section 01 60 00 - Product Requirements, for additional provisions.
- B. Provide 50 lineal feet of base, of each type and color specified.

**PART 2 PRODUCTS****2.01 RESILIENT BASE**

- A. Resilient Base (RB): ASTM F 1861, Type TS rubber, vulcanized thermoset; top set Style B, Cove, and as follows:
  - 1. Height: 4 inch.
  - 2. Thickness: 0.125 inch thick.
  - 3. Finish: Satin.
  - 4. Length: Roll.
  - 5. Color: As indicated on Drawings.
    - a. RB-1: Roppe 100 Black
    - b. RB-2: Roppe 129 Dolphin
  - 6. Accessories: Premolded external corners and end stops.

7. Manufacturers:
  - a. Burke Flooring: [www.burkemercer.com](http://www.burkemercer.com).
  - b. Johnsonite, a Tarkett Company: [www.johnsonite.com](http://www.johnsonite.com).
  - c. Roppe Corp: [www.roppe.com](http://www.roppe.com).
  - d. Substitutions: See Section 01 60 00 - Product Requirements.

## **2.02 ACCESSORIES**

- A. Primers, Adhesives, and Seaming Materials: Waterproof; types recommended by flooring manufacturer.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify that surfaces are flat to tolerances acceptable to flooring manufacturer, free of cracks that might telegraph through flooring, clean, dry, and free of curing compounds, surface hardeners, and other chemicals that might interfere with bonding of flooring to substrate.
- B. Verify that sub-floor surfaces are smooth and flat within the tolerances specified for that type of work and are ready to receive resilient flooring.
- C. 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.

### **3.02 PREPARATION**

- A. Remove existing resilient flooring and flooring adhesives; follow the recommendations of RFCI Recommended Work Practices for Removal of Resilient Floor Coverings.
- B. Clean substrate.
- C. Apply primer as required to prevent "bleed-through" or interference with adhesion by substances that cannot be removed.

### **3.03 INSTALLATION**

- A. Starting installation constitutes acceptance of sub-floor conditions.
- B. Install in accordance with manufacturer's instructions.
- C. Spread only enough adhesive to permit installation of materials before initial set.

### **3.04 RESILIENT BASE**

- A. Fit joints tightly and make vertical. Maintain minimum dimension of 18 inches between joints.
- B. Miter internal corners. At external corners, use premolded units. At exposed ends, use premolded units.
- C. Install base on solid backing. Bond tightly to wall and floor surfaces.
- D. Scribe and fit to door frames and other interruptions.

### **3.05 CLEANING**

- A. Remove excess adhesive from floor, base, and wall surfaces without damage.
- B. Clean in accordance with manufacturer's instructions.

**END OF SECTION**

## TILE CARPETING

### PART 1 GENERAL

#### 1.01 SECTION INCLUDES

- A. Carpet tile, fully adhered.

#### 1.02 RELATED REQUIREMENTS

- A. Section 03 30 00 - Cast-In-Place Concrete: Floor substrate.
- B. Section 09 65 00 - Resilient Flooring: Base Finish and transition strips.

#### 1.03 REFERENCE STANDARDS

- A. ASTM D2859 - Standard Test Method for Ignition Characteristics of Finished Textile Floor Covering Materials; 2006 (Reapproved 2011).
- B. ASTM E648 - Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source; 2014c.
- C. CRI (CIS) - Carpet Installation Standard; Carpet and Rug Institute; 2009.
- D. CRI 104 - Standard for Installation of Commercial Textile Floorcovering Materials; Carpet and Rug Institute; 2002.
- E. CRI (GLA) - Green Label Testing Program - Approved Adhesive Products; Carpet and Rug Institute; current edition.
- F. 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; sizes, patterns, colors available, and method of installation.
- C. Samples: Submit two carpet tiles illustrating color and pattern design for each carpet color selected.
- D. Manufacturer's Installation Instructions: Indicate special procedures.
- E. Maintenance Data: Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning.
- 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 Carpet Tiles: Quantity equal to 5 percent of total installed of each color and pattern installed.

#### 1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing specified carpet tile with minimum three years documented experience.
- B. Installer Qualifications: Company specializing in installing carpet with minimum three years documented experience.

#### 1.06 FIELD CONDITIONS

- A. Store materials in area of installation for minimum period of 24 hours prior to installation.

**PART 2 PRODUCTS****2.01 MANUFACTURERS**

- A. Interface, Inc; Product Off Line: [www.interface.com](http://www.interface.com).
- B. Other Acceptable Manufacturers:
  1. Substitutions: See Section 01 60 00 - Product Requirements.

**2.02 MATERIALS**

- A. Carpet Tile Type CPT-1: Tufted, textured loop, manufactured in mergeable dye lots.
  1. Tile Size: 9.845 x 39.38 inch.
  2. Fiber System: Solution dyed, Aquafil Type 6 Nylon.
  3. Pile Height: 0.16 inch.
  4. Color: 104331 Mushroom/Mustard.
  5. Critical Radiant Flux: Minimum of 0.22 watts/sq cm, when tested in accordance with ASTM E648 or NFPA 253.
  6. Surface Flammability Ignition: Pass ASTM D2859 (the "pill test").
  7. Max. Electrostatic Charge: 3.0 Kv. at 20 percent relative humidity.
  8. Gage: 1/12 inch.
  9. Stitches: 9 per inch.
  10. Pile Weight: 21 oz/sq yd.
  11. Density Factor: 6,146 kilotex.
  12. Backing: GlasBac RE.

**2.03 ACCESSORIES**

- A. Sub-Floor Filler: White premix latex; type recommended by flooring material manufacturer.
- B. Adhesives: Acceptable to carpet tile manufacturer, compatible with materials being adhered; maximum VOC of 50 g/L; CRI Green Label certified; in lieu of labeled product, independent test report showing compliance is acceptable.

**PART 3 EXECUTION****3.01 EXAMINATION**

- A. Verify that sub-floor surfaces are smooth and flat within tolerances specified for that type of work and are ready to receive carpet tile.
- B. Verify that wall surfaces are smooth and flat within the tolerances specified for that type of work, are dust-free, and are ready to receive carpet tile.
- C. Verify that sub-floor surfaces are dust-free and free of substances that could impair bonding of adhesive materials to sub-floor surfaces.
- D. Verify that concrete sub-floor surfaces are ready for carpet tile installation by testing for moisture emission rate and alkalinity; obtain instructions if test results are not within the following limits:
  1. Moisture emission rate: Not greater than 3 lb per 1000 sq ft per 24 hours when tested using calcium chloride moisture test kit for 72 hours.
  2. Alkalinity: pH range of 5-9.

**3.02 PREPARATION**

- A. Remove sub-floor ridges and bumps. Fill minor or local low spots, cracks, joints, holes, and other defects with sub-floor filler.
- B. Apply, trowel, and float filler to achieve smooth, flat, hard surface. Prohibit traffic until filler is cured.
- C. Vacuum clean substrate.

**3.03 INSTALLATION**

- A. Starting installation constitutes acceptance of sub-floor conditions.
- B. Install carpet tile in accordance with manufacturer's instructions and CRI Carpet Installation Standard.
- C. Install carpet tile in accordance with manufacturer's instructions and CRI 104.
- D. Blend carpet from different cartons to ensure minimal variation in color match.
- E. Cut carpet tile clean. Fit carpet tight to intersection with vertical surfaces without gaps.
- F. Lay carpet tile in ashlar pattern, with pile direction parallel to next unit, set stripe to run as follows:
  - 1. Parallel to South wall at Shared Learning.
  - 2. Parallel to East wall at Administration and Media Center.
- G. Locate change of color or pattern between rooms under door centerline.
- H. Fully adhere carpet tile to substrate.
- I. Trim carpet tile neatly at walls and around interruptions.
- J. Complete installation of edge strips, concealing exposed edges.

**3.04 CLEANING**

- A. Remove excess adhesive without damage, from floor, base, and wall surfaces.
- B. Clean and vacuum carpet surfaces.

**END OF SECTION**

**METAL INTERIOR WALL PANELS****PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Interior sheet metal faced wall panels.

**1.02 RELATED SECTIONS**

- A. Section 09 21 16 - Gypsum Board Systems.

**1.03 REFERENCE STANDARDS**

- A. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2010.
- B. PS 1 - Construction and Industrial Plywood; National Institute of Standards and Technology (Department of Commerce); 1995.

**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, finish; and installation instructions.
- C. Samples: Submit two samples 4 x 4 inch in size illustrating material and finish.

**1.05 DELIVERY, STORAGE, AND HANDLING**

- A. Store panels flat, indoors, on a clean, dry surface. Remove packaging and allow panels to acclimate to room temperature for 48 hours prior to installation.

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

- A. Metal Panels: ASTM A666 Type 304, soft temper.
  - 1. Thickness: 0.025 inch (24 gage).
  - 2. Finish: Smooth, No. 4.
- B. Backing: Softwood plywood, PS 1 Grade A; Graded in accordance with AWI/AWMAC Quality Standards Illustrated, Premium quality; veneer core; Douglas fir face species; 48 x 96 inch sheet size; 1/2 inch thickness.
- C. Mounting: Aluminum clips as indicated on Drawings.
- D. Adhesive: Type recommended by panel manufacturer.

**2.02 FABRICATION**

- A. Fabricate panels to layout indicated on Drawings and approved Shop Drawings.
- B. Form sections true to shape, accurate in size, square, and free from distortion or defects.
- C. Form each panel with one sheet of metal without joints at face.
- D. Adhesive apply metal to backing; form to wrap edges.

**PART 3 EXECUTION****3.01 EXAMINATION**

- A. Verify existing conditions and substrate flatness before starting work.
- B. Verify that substrate conditions are ready to receive the work of this section.



**3.02 INSTALLATION**

- A. Install panels in accordance with manufacturer's instructions.
- B. Install panel using clips secured to substrate.
- C. Install panels to wall with seams plumb and pattern aligned with adjoining panels.
- D. Install panels with uniform gaps as indicated on Drawings.

**END OF SECTION**

## ACOUSTICAL WALL SYSTEMS

### PART 1 GENERAL

#### 1.01 SECTION INCLUDES

- A. Fabricated, fabric-covered acoustical wall panels.
- B. Accessories as required for complete installation.

#### 1.02 RELATED REQUIREMENTS

- A. Section 10 11 01 - Visual Display Boards: Prefabricated, framed tackboards and markerboards.
- B. Section 10 11 24 - Tackable Wall Systems: Site-fabricated, fabric-covered display walls.

#### 1.03 REFERENCE STANDARDS

- A. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 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, including:
  - 1. Preparation instructions and recommendations.
  - 2. Storage and handling requirements and recommendations.
  - 3. Installation methods.
- C. Shop Drawings: Elevations indicating proposed locations of fabric seams and details indicating typical transitions to other finish surfaces.
- D. Verification Samples:
  - 1. For each fabric specified, minimum size 8 inches square, representing actual product in color, texture, and pattern.
  - 2. Acoustical backing material, minimum 12 inches square.
- E. Warranty: Submit manufacturer's warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

#### 1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company with not less than 5 years of experience in manufacturing acoustical products similar to those specified.
- B. Surface Burning Characteristics: Provide system with flame spread index of 25, maximum, and smoke developed index of 40, maximum, when tested in accordance with ASTM E84.

#### 1.06 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. Store panels flat, in dry, well-ventilated space; do not stand panels on end.
- C. Protect panel edges from damage.

#### 1.07 FIELD CONDITIONS

- A. Do not begin installation until interior conditions have reached temperature and humidity that will be maintained during occupancy. Do not install products under environmental conditions outside manufacturer's absolute limits.

**PART 2 PRODUCTS****2.01 ACOUSTICAL WALL PANELS**

- A. Tackable Acoustic Wall Panel (TAWP): Fabric covered fiberglass panel; laminated core consisting of one layer of 6.0 - 7.0 pcf density fiberglass with top layer of 1/8 inch thick 16.0 - 20.0 pcf density fiberglass; tackable; fabric facing wrapped and secured to back of panel.
  - 1. NRC Rating: 0.80 per ASTM C423.
  - 2. Panel Size: As indicated on Drawings.
  - 3. Panel Thickness: 2-1/8 inches total.
  - 4. Fabric Facing: Trapeze Highwire TPZ-5280 by Luna Textiles: [www.lunatextiles.com](http://www.lunatextiles.com).
  - 5. Mounting: Velcro method approved by manufacturer.
  - 6. Product:
    - a. Jasco Quiet Touch Extra by GTS Interior Supply, Inc: [www.jasco-usa.com](http://www.jasco-usa.com).
    - b. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Non-Tackable Acoustic Wall Panel (AWP): Fabric covered fiberglass panel; one layer of 6.0 - 7.0 pcf density fiberglass; fabric facing wrapped and secured to back of panel.
  - 1. NRC Rating: 0.90 per ASTM C423.
  - 2. Panel Size: As indicated on Drawings.
  - 3. Panel Thickness: 1 inch total.
  - 4. Fabric Facing:
    - a. Typical: Trapeze Highwire TPZ-5280 by Luna Textiles: [www.lunatextiles.com](http://www.lunatextiles.com).
    - b. Drama / Platform: FR701 Black by Guilford of Maine: [www.guilfordofmaine.com](http://www.guilfordofmaine.com)
  - 5. Mounting: Velcro method approved by manufacturer.
  - 6. Product:
    - a. Jasco Quiet Touch by GTS Interior Supply, Inc: [www.jasco-usa.com](http://www.jasco-usa.com).
    - b. Substitutions: See Section 01 60 00 - Product Requirements.

**2.02 ACCESSORIES**

- A. Adhesives: Low VOC or water-based, approved by wall system manufacturer.
- B. Trim: Extruded aluminum, profiles as indicated on Drawings.

**2.03 FABRICATION**

- A. Fabricate panels to sizes and layout indicated on Drawings.
- B. Apply adhesive to exposed face of substrate.
- C. Wrap panel core material with fabric covering edges and returning fabric minimum 2 inches on back of panel

**PART 3 EXECUTION****3.01 EXAMINATION**

- A. Do not begin installation until substrates have been properly prepared.
- B. Verify that all casework, markerboards, door and window jambs, finished ceiling, and other finished items abutting acoustical wall systems have been installed.
- C. 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. Remove wall plates and other obstacles, and prepare substrates to receive core material in accordance with manufacturer's instructions.

**3.03 INSTALLATION**

- A. Install acoustical wall systems at locations indicated , complying with manufacturer's instructions.
- B. Install to layout indicated on approved shop drawings.
- C. Install perimeter trim, secure to wall substrate.
- D. Attach panels to walls mechanically Velcro method.

**3.04 CLEANING**

- A. Clean exposed surfaces of acoustical wall system, complying with manufacturer's instructions for cleaning and repair of minor finish damage. Remove and replace work that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

**3.05 PROTECTION**

- A. Protect installed products until completion of project, using methods that will ensure that the finished work will be without damage or deterioration at Date of Substantial Completion.

**END OF SECTION**

## ACOUSTIC ROOM COMPONENTS

### PART 1 GENERAL

#### 1.01 SECTION INCLUDES

- A. Plastic ceiling diffusers.

#### 1.02 RELATED REQUIREMENTS

- A. Section 09 51 00 - Acoustical Ceilings: Ceiling suspension system.

#### 1.03 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Manufacturer's printed data sheets for products specified.

#### 1.04 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company with not less than 5 years of experience in manufacturing acoustical products similar to those specified.

### PART 2 PRODUCTS

#### 2.01 DIFFUSER PANELS

- A. Ceiling Diffuser Panels (CDP): Thermo formed plastic, 0.125 inch material thickness.
  - 1. Diffuser Size: 48 x 48 inches.
  - 2. Diffuser Shape: Barrel.
  - 3. Finish: White.
  - 4. Mounting: Drop-in, to fit suspension ceiling system specified in Section 09 51 00 - Acoustical Ceilings.
  - 5. Product:
    - a. Barrel Ceiling Diffuser by Wenger Corporation: [www.wengercorp.com](http://www.wengercorp.com).
    - b. Substitutions: See Section 01 60 00 - Product Requirements.

### 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 ceiling diffusers in suspended ceiling system.

**END OF SECTION**

**PAINTING AND COATING****PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Surface preparation.
- B. Field application of paints, stains, varnishes, and other coatings.
- C. Scope: Finish all interior and exterior surfaces exposed to view, unless fully factory-finished and unless otherwise indicated, including the following:
- 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. Floors, unless specifically so indicated.
  6. Glass.
  7. Concealed pipes, ducts, and conduits.
- E. See Schedule - Surfaces to be Finished, at end of Section.

**1.02 RELATED REQUIREMENTS**

- A. Section 05 50 00 - Metal Fabrications: Shop-primed items.
- B. Section 05 51 00 - Metal Stairs: Shop-primed items.
- C. Section 06 40 00 - Architectural Woodwork: Pre-finished wall and ceiling panels; wood door and relite frames for site finishing.
- D. Section 08 11 13 - Hollow Metal Doors and Frames: Shop-primed items.
- E. Section 08 31 00 - Access Doors and Frames: Shop-primed items.

**1.03 REFERENCE STANDARDS**

- A. ASTM D4442 - Standard Test Methods for Direct Moisture Content Measurement of Wood and Wood-Base Materials; 2007.

**1.04 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on all finishing products, including VOC content.
- C. Samples: Submit two painted samples, illustrating selected colors and textures for each color and system selected with specified coats cascaded. Submit on gloss thick paper, 8-1/2 x 11 inch in size.
- D. Manufacturer's Instructions: Indicate special surface preparation procedures.
- E. Maintenance Data: Submit data on cleaning, touch-up, and repair of painted and coated surfaces.

**1.05 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified, with minimum three years documented experience.
- B. Applicator Qualifications: Company specializing in performing the type of work specified with minimum three years documented experience.

**1.06 MOCK-UP**

- A. See Section 01 40 00 - Quality Requirements, for general requirements for mock-up.
- B. Provide one room as a mockup, illustrating coating colors, texture, and finish; include door and frame.
- C. Locate where directed.
- D. Mock-up may remain as part of the work.

**1.07 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.
- B. Container Label: Include manufacturer's name, type of paint, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.
- C. 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.

**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. Minimum Application Temperature for Varnish Finishes: 65 degrees F for interior or exterior, unless required otherwise by manufacturer's instructions.
- F. Provide lighting level of 80 ft candles measured mid-height at substrate surface.

**1.09 EXTRA MATERIALS**

- A. See Section 01 60 00 - Product Requirements, for additional provisions.
- B. Supply 1 gallon of each color; store where directed.
- C. Label each container with color in addition to the manufacturer's label.

**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. Substitutions: See Section 01 60 00 - Product Requirements.

**2.02 PAINTS AND COATINGS - GENERAL**

- A. 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.

B. Primers: Where the manufacturer offers options on primers for a particular substrate, use primer categorized as "best" by the manufacturer.

### 2.03 PRODUCTS

A. Concrete Sealer:

1. ProSoCo, Inc, Sure-Klean Weather Seal Siloxane WB
2. Tamms Industries, Co, Barcade Siloxane 6
3. Fabrikem Co., Fabrishield

B. Block Filler:

1. Rodda Paint Company, 501901 Block Filler.
2. The Sherwin-Williams Company, Heavy Duty Block Filler B42W46.
3. Glidden, 3010 Interior/Exterior Block Filler.

C. Galvanized Metal Primer:

1. Rodda Paint Company, 74079x Galva Cling
2. The Sherwin-Moore Company, Galvite B50
3. Glidden, Devgard 4120

D. Rust Inhibiting Metal Primer:

1. Rodda Paint Company, 7082xxx Barrier III HS Primer
2. The Sherwin Williams Company, Kem Kromik B50WZ1
3. Glidden, Devcryn 1440

E. Exterior Latex Primer / Sealer:

1. Rodda Paint Company, First Coat Primer
2. The Sherwin Williams Company, ProBlock Primer Sealer
3. Glidden, Gripper Interior/Exterior Primer

F. Interior Latex Primer / Sealer:

1. Rodda Paint Company, Scotseal 5078011
2. The Sherwin Williams Company, PVA Drywall Primer Sealer
3. Glidden, 1000-1200 Prep & Prime Hi-Hide
4. Parker Paint Mfg. Co. Inc, 9125 Pro Seal

G. Exterior Acrylic Latex - Low Luster:

1. Rodda Paint Company, AC909 Exterior Satin Latex
2. The Sherwin Williams Company, Super Paint
3. Glidden, 2412 Ultra-Hide Durus Exterior Acrylic Satin Finish

H. Exterior Acrylic Latex - Semi-Gloss:

1. Rodda Paint Company, Unique II Exterior
2. The Sherwin Williams Company, Solo
3. Glidden, Ultra-Hide 150 Exterior Acrylic Finish

I. Acrylic Latex Enamel - Semi-Gloss:

1. Rodda Paint Company, Unique II 54200XX
2. The Sherwin Williams Company, ProMar 200 B31W2651
3. Glidden, 1416 Ultra-Hide

J. Acrylic Latex Enamel - Egg Shell Gloss:

1. Rodda Paint Company, Lasyn II Eggshell
2. The Sherwin Williams Company, ProMar 200 B20W200
3. Glidden, 1412 Ultra-Hide

K. Acrylic Latex Enamel - Flat:

1. Rodda Paint Company, Unique II 51300XX
2. The Sherwin Williams Company, ProMar 200 B30W2651



- 3. Glidden, 1210 Ultra-Hide
- L. Acrylic Polymer - Floor Finish - Satin:
  - 1. Rosco Laboratories, Rosco Tough Prime, Black.
- M. Alkyd Enamel - Semi-Gloss:
  - 1. Rodda Paint Company, Multi Master DTM
  - 2. The Sherwin-Williams Company, B66-650 Series
  - 3. Glidden, 1516 Ultra-Hide.
- N. Epoxy Coating System:
  - 1. Rodda Paint Company, Cloverdale 7053 EcoLogic Waterborne Epoxy
  - 2. The Sherwin-Williams Company, High Solids Epoxy B73-300 Line
  - 3. Glidden, Tru Glaze WB
- O. Video Production Room (Green Room) Specialty System:
  - 1. Rosco Laboratories, Rosco Spectrum, #5711 Chroma Key Green
- P. Interior/Exterior Concrete Wall Sealer: Clear siloxane penetrating sealer
  - 1. Prosoco Inc., Weather Seal Siloxane WB
  - 2. The Sherwin-Williams Company, 7% Siloxane.
- Q. Brick Masonry Sealer:
  - 1. Protectosil Chem-Trete 40 VOC by Evonik Industries: [www.protectosil.com](http://www.protectosil.com).
- R. Wood Finish, Transparent:
  - 1. AWI/AWMAC Architectural Woodwork Standards, Section 5, Conversion Varnish, Transparent.
- S. Electrostatic Coating System: Polyester Powder Coat Finish.
  - 1. The Sherwin-Williams Company, Powdura Super Durable TGIC Powder Coating.
- T. Substitutions: See Section 01 60 00 - Product Requirements.

## **2.04 ACCESSORY MATERIALS**

- A. Accessory Materials: Provide all primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials required to achieve the finishes specified whether specifically indicated or not; commercial quality.
- B. Patching Material: Latex filler.
- C. Fastener Head Cover Material: Latex filler.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify that surfaces are ready to receive work as instructed by the product manufacturer.
- B. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially affect proper application.
- C. Test shop-applied primer for compatibility with subsequent cover materials.
- D. 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.
  - 3. Interior Wood: 15 percent, measured in accordance with ASTM D4442.

### **3.02 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. Remove or mask surface appurtenances, including electrical plates, hardware, light fixture trim, escutcheons, and fittings, prior to preparing surfaces or finishing.
- D. Surfaces: Correct defects and clean surfaces which affect work of this section. Remove or repair existing coatings that exhibit surface defects.
- E. Seal surfaces that might cause bleed through or staining of topcoat.
- F. Remove mildew from impervious surfaces by scrubbing with solution of tetra-sodium phosphate and bleach. Rinse with clean water and allow surface to dry.
- G. Concrete and Unit 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.
- H. Gypsum Board Surfaces to be Painted: Fill minor defects with filler compound. Spot prime defects after repair.
- I. Insulated Coverings to be Painted: Remove dirt, grease, and oil from canvas and cotton.
- J. Galvanized Surfaces to be Painted: Remove surface contamination and oils and wash with solvent. Apply coat of etching primer.
- K. Uncorroded 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 hand 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.
- L. Shop-Primed 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. Re-prime entire shop-primed item.
- M. Interior Wood Items to Receive Transparent Finish: Wipe off dust and grit prior to sealing, seal knots, pitch streaks, and sappy sections with sealer. Fill nail holes and cracks after sealer has dried; sand lightly between coats. Seal concealed surfaces with gloss varnish reduced 25 percent with thinner.
- N. Metal Doors to be Painted: Prime metal door top and bottom edge surfaces.

### 3.03 APPLICATION

- A. Apply products in accordance with manufacturer's instructions.
- B. Do not apply finishes to surfaces that are not dry. Allow applied coats to dry before next coat is applied.
- C. Apply each coat to uniform appearance.
- D. Sand wood and metal surfaces lightly between coats to achieve required finish.
- E. Vacuum clean surfaces of loose particles. Use tack cloth to remove dust and particles just prior to applying next coat.
- F. Wood to Receive Transparent Finishes: Tint fillers to match wood. Work fillers into the grain before set. Wipe excess from surface.
- G. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.

**3.04 FINISHING MECHANICAL AND ELECTRICAL WORK**

- A. Refer to Section 20 10 00 - General Mechanical Provisions for provision on painting of work of Divisions 20, 21, 22 and 23.
- B. Paint shop-primed equipment, where indicated.
- C. Remove unfinished louvers, grilles, covers, and access panels on mechanical and electrical components and paint separately.
- D. Finish equipment, piping, conduit, and exposed duct work in utility areas in colors according to the color coding scheme indicated.
- E. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.

**3.05 CLEANING**

- A. Collect waste material that could constitute a fire hazard, place in closed metal containers, and remove daily from site.

**3.06 SCHEDULE - SURFACES TO BE FINISHED**

- A. Do Not Paint or Finish the Following Items:
  - 1. Items fully factory-finished unless specifically noted.
  - 2. Fire rating labels, equipment serial number and capacity labels.
  - 3. Stainless steel items.
- B. Paint the surfaces described below under Schedule - Paint Systems and testing.
- C. Mechanical and Electrical: Use paint systems defined for the substrates to be finished.
  - 1. Paint all insulated and exposed pipes occurring in finished areas to match background surfaces, unless otherwise indicated.
  - 2. Paint all equipment, including that which is factory-finished, exposed to weather or to view on the roof and outdoors.
  - 3. Paint shop-primed items occurring in finished areas.
  - 4. 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.
  - 5. Paint dampers exposed behind louvers, grilles, and convector and baseboard cabinets to match face panels.
  - 6. Paint interior of ductwork black behind all grilles.

**3.07 SYSTEMS SCHEDULE - EXTERIOR**

- A. Galvanized Steel:
  - 1. Prepare surfaces.
  - 2. One coat Galvanized Metal Primer.
  - 3. Two coats Exterior Alkyd Enamel, semi-gloss.
  - 4. Colors: As indicated on Drawings.
- B. Ferrous Metal:
  - 1. Prepare surfaces.
  - 2. One coat Rust Inhibiting Primer.
  - 3. Two coats Exterior Alkyd Enamel.
  - 4. Colors: As indicated on Drawings.
- C. Gypsum Board Soffits:
  - 1. Prepare surfaces.
  - 2. One coat Exterior Primer/Sealer.
  - 3. Two coats Exterior Acrylic Latex, Semi-Gloss.
  - 4. Colors: As indicated on Drawings.
- D. Brick Veneer:

1. Prepare surfaces.
  2. Two coats Brick Masonry Sealer.
- E. Existing Steel Bike Racks:
1. Prepare surfaces.
  2. Electrostatic finish:
  3. Color: Custom color as selected.
- F. Wire Mesh Fencing:
1. Prepare surfaces.
  2. Electrostatic finish:
  3. Color: Custom color as selected.

### 3.08 SYSTEMS SCHEDULE - INTERIOR

- A. Concrete Floors, Exposed:
1. Prepare surfaces.
  2. Two applications of Concrete Floor Sealer.
- B. Gypsum Wall Board, Walls:
1. Prepare surfaces.
  2. One coat Interior Latex Primer / Sealer.
  3. Two coats Acrylic Latex Enamel, Egg-Shell Gloss.
  4. Colors: As indicated on Drawings.
- C. Gypsum Wall Board, Ceilings and Soffits:
1. Prepare surfaces.
  2. One coat Interior Latex Primer / Sealer.
  3. Two coats Acrylic Latex Enamel, Egg-Shell Gloss.
  4. Colors: As indicated on Drawings.
- D. Wall Board, Wall and Ceilings at Toilet Rooms, Kitchen, Custodial Closets (EP)
1. Prepare surfaces.
  2. One coat Epoxy Primer.
  3. Two coats Epoxy Top Coat.
  4. Color: As indicated on Drawings.
- E. Concrete Masonry / Concrete (EP):
1. Prepare surfaces.
  2. One coat Block Filler.
  3. One coat Epoxy Primer.
  4. Two coats Epoxy Top Coat.
  5. Color: As indicated on Drawings.
- F. Concrete Masonry / Concrete (PT):
1. Prepare surfaces.
  2. One coat Block Filler.
  3. Two coats Acrylic Latex Enamel, Egg-Shell Gloss.
  4. Colors: As indicated on Drawings.
- G. Galvanized Steel:
1. Prepare surfaces.
  2. One coat Galvanized Metal Primer.
  3. Two coats Alkyd Enamel, semi-gloss.
  4. Colors: As indicated on Drawings.
- H. Ferrous Metal:
1. Prepare surfaces.
  2. One coat Rust Inhibiting Primer.
  3. Two coats Alkyd Enamel, semi-gloss.
  4. Colors: As indicated on Drawings.

- I. Wood Door and Relite Frames:
  - 1. Prepare surfaces.
  - 2. AWI AWI/AWMAC, Conversion Varnish System, Transparent.
  - 3. Color: Clear.
- J. Wood Floor at Platform:
  - 1. Prepare surfaces.
  - 2. Two coats Acrylic Polymer - Floor Finish.
  - 3. Color: Black.
- K. Green Room (Video Production) Walls:
  - 1. Prepare surfaces.
  - 2. One coat Interior Latex Primer / Sealer.
  - 3. Two coats Green Room Finish, matte.
  - 4. Colors: Standard spectrum green.

**3.09 SCHEDULE - COLORS**

- A. PT-1: Glidden (ICI) Whisper White.
- B. PT-2: Custom color to match exterior wall panel.
- C. PT-3: Rosco Spectrum, #5711 Chroma Key Green.
- D. PT-4: Sherwin Williams SW6991 Black Magic.
- E. EPT-1: Custom color to match exterior panel specified in Section 07 42 13.16, AYW Yellow.
- F. EPT-2: Custom color to match exterior panel specified in Section 07 42 13, ABE Blue.

**END OF SECTION**

## VISUAL DISPLAY BOARDS

### PART 1 GENERAL

#### 1.01 SECTION INCLUDES

- A. Markerboards (White Board).
- B. Tack rails at classrooms and hallways.

#### 1.02 RELATED REQUIREMENTS

- A. Section 06 40 00 - Architectural Wood Casework.
- B. Section 08 14 16 - Flush Wood Doors.
- C. Section 09 21 16 - Gypsum Board Assemblies: Concealed supports in metal stud walls.
- D. Section 10 11 24 - Tackable Display Boards: Tackboards and wall panels.

#### 1.03 REFERENCE STANDARDS

- A. ANSI A208.1 - American National Standard for Particleboard; 2009.
- B. ASTM A424 - Standard Specification for Steel, Sheet, for Porcelain Enameling; 2009a.

#### 1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide manufacturer's data on chalkboard, markerboard, tackboard, tackboard surface covering, trim, and accessories.
- C. Shop Drawings: Indicate wall elevations, dimensions, joint locations, special anchor details.
- D. Samples: Submit two samples 2 by 2 inch in size illustrating materials and finish, color and texture of chalkboard, markerboard, tackboard, tackboard surfacing, and trim.
- E. Manufacturer's printed installation instructions.
- F. Maintenance Data: Include data on regular cleaning, stain removal .

#### 1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

#### 1.06 WARRANTY

- A. See Section 01 78 00 - Closeout Submittals - Closeout Submittals, for additional warranty requirements.

### PART 2 PRODUCTS

#### 2.01 MANUFACTURERS

- A. Visual Display Boards:
  1. MooreCo, Inc: [www.moorecoinc.com](http://www.moorecoinc.com).
  2. Claridge Products and Equipment, Inc: [www.claridgeproducts.com](http://www.claridgeproducts.com).
  3. Polyvision Corporation (Nelson Adams): [www.polyvision.com](http://www.polyvision.com).
  4. Substitutions: See Section 01 60 00 - Product Requirements.

#### 2.02 VISUAL DISPLAY BOARDS

- A. Markerboards: Porcelain enamel on steel, laminated to core; magnetic type.
  1. Color: White.

2. Steel Face Sheet Thickness: 24 gage, 0.0239 inch .
  3. Core: Particleboard, manufacturer's standard thickness, laminated to face sheet.
  4. Backing: Aluminum foil, laminated to core.
  5. Size: As indicated on drawings.
  6. Frame: Stainless steel .
    - a. Frame Profile: Roll-formed "L" shaped without integrated spacer.
    - b. Product: To match SCHIENE E by Schluter Systems LP: [www.schluter.com](http://www.schluter.com).
  7. Accessories: Provide chalk tray and map rail.
- B. Markerboard Finish for Casework and Doors: Porcelain enamel on steel; magnetic type.
1. Color: White.
  2. Steel Face Sheet Thickness: 24 gage, 0.0239 inch .
  3. Size: As indicated on drawings.

### 2.03 MATERIALS

- A. Porcelain Enameled Steel Sheet: ASTM A424, Type I, Commercial Steel, with fired-on vitreous finish.
- B. Cork: Natural cork.
- C. Particleboard: ANSI A208.1; wood chips, set with waterproof resin binder, sanded faces.
- D. Foil Backing: Aluminum foil sheet, 0.005 inch thick.
- E. Adhesives: Type used by manufacturer.

### 2.04 ACCESSORIES

- A. Tack Rail: Extruded aluminum, manufacturer's standard profile, with cork insert and runners for accessories; 1 inch wide overall, full width of frame; concealed mounting.
- B. Magnetic Chalk Tray: Extruded aluminum, magtray molded ends; magnetic attachment, white powder coat finish, 24 inch length.
- C. Mounting: Concealed.

## 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. Install markerboard facing on casework and doors with compatible adhesive' bevel edges.
- C. Install with top of chalk tray at 30 inches above finished floor.
- D. Secure units level and plumb.
- E. Butt Joints: Install with tight hairline joints.
- F. Carefully cut holes in boards for thermostats, wall switches, and other projections.
- G. Chalk Tray: Provide one unit per each 12 linear feet of markerboard; minimum one unit per each markerboard.

### 3.03 CLEANING

- A. Clean board surfaces in accordance with manufacturer's instructions.

- B. Remove temporary protective cover at date of Substantial Completion.

**END OF SECTION**



## TACKABLE WALL SYSTEMS

### PART 1 GENERAL

#### 1.01 SECTION INCLUDES

- A. Tackable wall surfacing.
- B. Accessories as required for complete installation.

#### 1.02 RELATED REQUIREMENTS

- A. Section 09 21 16 - Gypsum Board Assemblies: Wall substrate.
- B. Section 09 83 11 - Acoustical Wall Systems: Fabricated, fabric-covered walls for acoustical control.
- C. Section 10 11 01 - Visual Display Boards: Prefabricated, framed markerboards.

#### 1.03 REFERENCE STANDARDS

- A. ANSI A208.2 - American National Standard for Medium Density Fiberboard for Interior Applications; 2009.
- B. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 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, including:
  - 1. Preparation instructions and recommendations.
  - 2. Storage and handling requirements and recommendations.
  - 3. Installation methods.
- C. Shop Drawings: Elevations indicating proposed locations of seams and details indicating typical transitions to other finish surfaces.
- D. Verification Samples:
  - 1. For each finish material specified, minimum size 8 inches square, representing actual product in color, texture, and pattern.

#### 1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Provide all components of tackable wall systems by a single manufacturer, including recommended primers, adhesives, and sealants.
- B. Installer Qualifications: Firm specializing in work of this section, with not less than three years of documented experience in installing wall systems of the type specified, and approved by the manufacturer.
- C. Mock-Up: Provide a mock-up for evaluation of application workmanship.
  - 1. Finish areas designated by Architect.
  - 2. Do not proceed with remaining work until workmanship and overall appearance are approved by Architect.
  - 3. Refinish mock-up area as required to produce acceptable workmanship.
  - 4. Approved mock-up may remain as part of the completed Work.

#### 1.06 DELIVERY, STORAGE, AND HANDLING

- A. Protect fabric, core, and track from excessive moisture in shipment, storage, and handling. Do not deliver materials to project until wet work such as concrete and plaster has been completed.
- B. Store products in manufacturer's unopened packaging until ready for installation.

- C. 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. Do not begin installation until interior conditions have reached temperature and humidity that will be maintained during occupancy. Do not install products under environmental conditions outside manufacturer's absolute limits.

### **1.08 EXTRA MATERIALS**

- A. See Section 01 60 00 - Product Requirements, for additional provisions.
- B. Supply 1 percent of finish material for Owner's use in maintenance of project.

## **PART 2 PRODUCTS**

### **2.01 MATERIALS**

- A. Frame: Stainless steel.
  1. Frame Profile: Roll-formed "L" shape without integrated joint spacer.
  2. Frame Finish: Brushed.
  3. Product: To match SCHIENE E by Schluter Systems LP: [www.schluter.com](http://www.schluter.com).
- B. Core:
  1. Material: Medium density wood fiberboard, 14-16 pcf density, fire-retardant, complying with ANSI 208.2.
- C. Tack Surface: Linoleum; 1/4 inch thickness; 2166 Natural Tan color.
  1. Bulletin Board by Forbo Flooring Systems.
  2. Substitutions: See Section 01 60 00 - Product Requirements.
- D. Fasteners: As recommended by manufacturer.
- E. Adhesives: Low VOC or water-based, approved by wall system manufacturer.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Do not begin installation until substrates have been properly prepared.
- B. Verify that all casework, markerboards, door and window jambs, finished ceiling, and other finished items abutting tackable wall systems have been installed.
- C. 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. Remove wall plates and other obstacles, and prepare substrates to receive core material in accordance with manufacturer's instructions.

### **3.03 INSTALLATION**

- A. Install tackable wall systems at locations indicated , complying with manufacturer's instructions.
- B. Trim: Install perimeter and intermediate track using fasteners appropriate to substrate, securing firmly to prevent track separation from substrate.
  1. Install trim around openings and penetrations.
  2. Allow for spacing to accommodate insertion of installation tool.

- C. Tackable Surface: Install with adhesive over installed tackable core; install units in a checkerboard pattern, butt joints to provide uniform surface finish.

**3.04 CLEANING**

- A. Clean exposed surfaces, complying with manufacturer's instructions for cleaning and repair of minor finish damage. Remove and replace work that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

**3.05 PROTECTION**

- A. Protect installed products until completion of project, using methods that will ensure that the finished work will be without damage or deterioration at Date of Substantial Completion.

**END OF SECTION**

## SIGNAGE

### PART 1 GENERAL

#### 1.01 SECTION INCLUDES

- A. Room signs.
- B. Labels at interior fire-rated walls.

#### 1.02 REFERENCE STANDARDS

- A. 36 CFR 1191 - Americans with Disabilities Act (ADA) Accessibility Guidelines for Buildings and Facilities; Architectural Barriers Act (ABA) Accessibility Guidelines; current edition.
- B. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design; 2010.
- C. ICC A117.1 - Accessible and Usable Buildings and Facilities; International Code Council; 2009 (ANSI).
- D. ATBCB ADAAG - Americans with Disabilities Act Accessibility Guidelines; 2004.

#### 1.03 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Manufacturer's printed product literature for each type of sign, indicating sign styles, font, foreground and background colors, locations, overall dimensions of each sign.
- C. Signage Schedule: Provide information sufficient to completely define each sign for fabrication, including room number, room name, other text to be applied, sign and letter sizes, fonts, and colors.
  - 1. When room numbers to appear on signs differ from those on the drawings, include the drawing room number on schedule.
  - 2. When content of signs is indicated to be determined later, request such information from Owner through Architect at least 2 months prior to start of fabrication; upon request, submit preliminary schedule.
  - 3. Submit for approval by Owner through Architect prior to fabrication.
- D. Samples: Submit two samples of each type of sign, of size similar to that required for project, illustrating sign style, font, and method of attachment.
- E. Selection Samples: Where colors are not specified, submit two sets of color selection charts or chips.
- F. Verification Samples: Submit samples showing colors specified.
- G. Manufacturer's Installation Instructions: Include installation templates and attachment devices.

#### 1.04 DELIVERY, STORAGE, AND HANDLING

- A. Package signs as required to prevent damage before installation.

### PART 2 PRODUCTS

#### 2.01 SIGNAGE APPLICATIONS

- A. Accessibility Compliance: Signs are required to comply with ADA Standards and ICC A117.1 and applicable building codes, unless otherwise indicated; in the event of conflicting requirements, comply with the most comprehensive and specific requirements.
- B. Type 1: Acrylic Wall Sign: 1/8" thick white acrylic background with gray text; frameless square edges, polished smooth edge; helvetica font.
  - 1. Size: 14-1/2 inches high x 9 inches wide.
  - 2. Text: Room number and braille, 2 inches high.
  - 3. Name Slot: 2 inch high, removal type, clear plastic cover.

4. Insert Slot: To accommodate 8-1/2 x 11 inch paper sheet, clear plastic cover.
  5. Locations: Classrooms, offices, work rooms, conference rooms; refer to Interior Elevations for specific locations.
- C. Type 2: Acrylic Wall Sign: 1/8" thick white acrylic background with gray text; frameless square edges, polished smooth edge; helvetica font.
1. Size: 2 inches high x 9 inches wide.
  2. Text: Room number and braille, 2 inches high.
  3. Locations: Locations not listed in Type 1 and Type 3.
- D. Type 3: Acrylic Wall Sign: 1/8" thick white acrylic background with gray text; frameless square edges, polished smooth edge; helvetica font.
1. Size: 9 x 9 inch square.
  2. Text and Graphic: "GIRLS", "BOYS", "UNISEX"; Braille; accessible wheelchair graphic.
  3. Locations: Toilet rooms and locker rooms.
- E. Fire-Rated Wall Labels:
1. Use self-adhering labels; 2 inch high polyester label with text not less than 1 inch high; water-proof; white background with black text.
  2. Apply to wall surface.
  3. Label Text: FIRE AND/OR SMOKE BARRIER - PROTECT ALL OPENINGS.

## **2.02 ACCESSORIES**

- A. Back Sheet at Glass Mounted Signs: Matching white acrylic sheet to match size and shape of sign at face of glass.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify that substrate surfaces are ready to receive work.

### **3.02 INSTALLATION**

- A. Install in accordance with manufacturer's instructions.
- B. Install neatly, with horizontal edges level.
- C. Locate signs where indicated:
1. Room Sign: Locate at the wall or glass relite next to the door or opening to each toilet room.
  2. Provide blank matching backing sheet on backside of glass mounted signs.
  3. If no location is indicated obtain Owner's instructions.
- D. Fire-Rated Wall Labels:
1. Locate labels above accessible finish ceilings at all fire-rated wall, fire barriers, fire partitions, smoke barriers, and smoke partitions.
  2. Install labels at spacing not to exceed 30 feet measured horizontally along wall or partition.
- E. Protect from damage until Substantial Completion; repair or replace damage items.

**END OF SECTION**

**ELECTRONIC MESSAGE SIGNAGE****PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Electronic message signage.

**1.02 RELATED REQUIREMENTS**

- A. Section 10 14 00 - Signage.
- B. Section 26 05 00 - Common Work Results for Electrical: Electrical connection.
- C. Division 27 - Communications: Data connections.

**1.03 REFERENCE STANDARDS**

- A. ATBCB ADAAG - Americans with Disabilities Act Accessibility Guidelines; 2004.

**1.04 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Manufacturer's printed product literature for each type of sign, indicating sign styles, font, foreground and background colors, locations, overall dimensions of each sign.
- C. Selection Samples: Where colors are not specified, submit two sets of color selection charts or chips.
- D. Manufacturer's Installation Instructions: Include installation templates and attachment devices.
- 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.

**1.05 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years of documented experience.

**1.06 DELIVERY, STORAGE, AND HANDLING**

- A. Package signs as required to prevent damage before installation.

**PART 2 PRODUCTS****2.01 ELECTRONIC MESSAGE SIGN**

- A. Description: Exterior LED display, 3 text lines at 5 inches high each; complete with graphics software; direct fiber cable communications to host operating computer.
- B. Face Cover: Lexan sheet.
- C. Finish: As selected from manufacturer's complete color line.
- D. Size: Nominal 72 inches wide by 24 inches high.
- E. Electrical Characteristics: 120 Volt AC.
- F. Product:
  1. Monochrome Series by Optec Displays, Inc: [www.optec.com](http://www.optec.com).
  2. Substitutions: Refer to Section 01 60 00 - Product Requirements.

**2.02 ACCESSORIES**

- A. Concealed Screws: Stainless steel, galvanized steel, chrome plated, or other non-corroding metal.

- B. Exposed Screws: Stainless steel.

**PART 3 EXECUTION**

**3.01 EXAMINATION**

- A. Verify that substrate surfaces and electrical rough-in are ready to receive work.

**3.02 INSTALLATION**

- A. Install in accordance with manufacturer's instructions.
- B. Install neatly, with horizontal edges level.
- C. Locate signs where indicated.

**3.03 CLOSEOUT ACTIVITIES**

- A. See Section 01 79 00 - Demonstration and Training, for additional requirements.
- B. Training: Train Owner's personnel on operation and maintenance of system.
  - 1. Use operation and maintenance manual as training reference, supplemented with additional training materials as required.
  - 2. Provide minimum of 1 hour of training.

**3.04 PROTECTION**

- A. Protect from damage until Substantial Completion; repair or replace damage items.

**END OF SECTION**

## **SOLID PHENOLIC TOILET AND SHOWER COMPARTMENTS**

### **PART 1 GENERAL**

#### **1.01 SECTION INCLUDES**

- A. Solid phenolic toilet compartments.
- B. Urinal screens.

#### **1.02 RELATED REQUIREMENTS**

- A. Section 05 12 00 - Structural Steel Framing: Concealed steel support members.
- B. Section 05 50 00 - Metal Fabrications: Concealed steel support members.
- C. Section 09 21 16 - Gypsum Board Assemblies: Metal wall and ceiling framing, backing and blocking.
- D. Section 09 22 26 - Suspension Systems: Ceiling suspension system for gypsum board finishes.
- E. Section 10 28 00 - Toilet, Bath, and Laundry Accessories.

#### **1.03 REFERENCE STANDARDS**

- A. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2010.

#### **1.04 ADMINISTRATIVE REQUIREMENTS**

- A. Coordination: Coordinate the work with placement of support framing and anchors in walls and ceilings.

#### **1.05 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. 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: Submit two samples of partition panels, 4 x 4 inch in size illustrating panel finish, color, and sheen.
- E. Manufacturer's Installation Instructions: Indicate special procedures.

#### **1.06 COORDINATION**

- A. Coordinate the work with placement of support framing and anchors in wall.

### **PART 2 PRODUCTS**

#### **2.01 MANUFACTURERS**

- A. Phenolic Plastic Toilet Compartments:
  - 1. Bobrick Washroom Equipment, Inc; Product Sierra Series: [www.bobrick.com](http://www.bobrick.com).
  - 2. Substitutions: Section 01 60 00 - Product Requirements.

#### **2.02 COMPONENTS**

- A. Toilet Compartments Configuration: Solid phenolic core, laminate finished, ceiling-hung.
- B. Doors, Panels, and Pilasters: Laminate finish surface, solid phenolic core, with beveled corners and edges; edges of cut-outs sealed; multiple colors as selected from manufacturer's complete color line.



1. Colors: Bobrick SC01 Golden Khaki color for doors, Bobrick SC01 Golden Khaki color for panels, textured, low gloss finish; black edges.
- C. Panel Dimensions:
  1. Thickness: 1/2 inch.
  2. Height: 58 inch.
- D. Pilaster Dimensions:
  1. Thickness: 3/4 inch.
  2. Height: Floor to ceiling, field verify.
- E. Door Dimensions:
  1. Thickness: 3/4 inch.
  2. Door Width, Typical: 24 inch.
  3. Door Width, ADA: 36 inch, out-swinging.
  4. Height: 58 inch.
- F. Urinal Screen Dimensions:
  1. Thickness: 1/2 inch.
  2. Height: 58 inch.

### **2.03 ACCESSORIES**

- A. Wall and Pilaster Brackets: Continuous type; Polished stainless steel.
- B. Attachments, Screws, and Bolts: Stainless steel, tamper proof type.
  1. For attaching panels and pilasters to brackets: Through-bolts and nuts; tamper proof.
- C. Hardware: Polished stainless steel:
  1. Pivot hinges, gravity type, adjustable for door close positioning; two per door.
  2. Nylon bearings.
  3. Thumb turn door latch with exterior emergency access feature.
  4. Heavy duty door strike and keeper with rubber bumper; mounted on pilaster in alignment with door latch.
  5. Coat hook with rubber bumper; one per compartment, mounted on door.
  6. Provide door pull for outswinging doors.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify that field measurements are as indicated on shop drawings.
- B. Verify correct spacing of and between plumbing fixtures.
- C. Verify correct location of built-in framing, anchorage, and bracing.

### **3.02 INSTALLATION**

- A. Install system components secure, rigid, plumb, and level in accordance with manufacturer's instructions.
- B. Maintain 3/8 to 1/2 inch space between wall and panels and between wall and end pilasters.
- C. Attach panel brackets securely to walls using anchor devices.
- D. Attach panels and pilasters to brackets.

### **3.03 TOLERANCES**

- A. Maximum Variation From True Position: 1/4 inch.
- B. Maximum Variation From Plumb: 1/8 inch.

**3.04 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**

## CUBICLES

### PART 1 GENERAL

#### 1.01 SECTION INCLUDES

- A. Surface mounted overhead metal curtain track and guides.
- B. Curtains.

#### 1.02 RELATED REQUIREMENTS

- A. Section 09 51 00 - Acoustical Ceilings: Suspended ceiling system to support track.

#### 1.03 REFERENCE STANDARDS

- A. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2014.
- 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 .
- C. Shop Drawings: Indicate a reflected ceiling plan view of curtain track, hangers and suspension points, attachment details, schedule of curtain sizes.
- D. Samples: Submit 12 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 .
- F. Maintenance Data: Include recommended cleaning methods and materials and stain removal methods.

#### 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 MANUFACTURERS

- A. Cubicle Track and Curtains:
  1. A. R. Nelson Co: [www.arnelson.com](http://www.arnelson.com).
  2. C/S General Cubicle: [www.c-sgroup.com/cubicle-track-curtains](http://www.c-sgroup.com/cubicle-track-curtains).
  3. Imperial Fastener Co., Inc: [www.imperialfastener.com](http://www.imperialfastener.com).
  4. Inpro: [www.inprocorp.com](http://www.inprocorp.com).
  5. Substitutions: See Section 01 60 00 - Product Requirements.

#### 2.02 TRACKS AND TRACK COMPONENTS

- A. Track: Extruded aluminum sections; one piece per cubicle track run; 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, Tees, Y's, and Switches: To fit track section.
  3. Track Bends: Minimum 12 inch radius; fabricated without deformation of track section or impeding movement of carriers.

4. Finish on Exposed Surfaces: Clear anodized finish.
- B. Curtain Carriers: Nylon slider to accurately fit track; designed to eliminate bind when curtain is pulled; fitted to curtain to prevent accidental curtain removal; one carrier for each 12 inches of fabric width.
- C. Wand: Aluminum hollow section, attached to lead carrier, for pull-to-close action.

### **2.03 CURTAINS**

- A. All Curtain Materials:
  1. Flame spread index of 25, maximum; smoke developed index of 450, maximum; when tested in accordance with ASTM E84.
  2. Naturally flame resistant or flameproofed; capable of passing NFPA 701 test.
  3. Curtain: Close weave polyester; anti-bacterial, self deodorizing, sanitized, and preshrunk.
  4. Color: 004 Field by Maharam.
  5. Open Mesh Cloth: Open weave to permit air circulation; flameproof material, same color as curtain.
  6. Curtain Fabrication:
    - a. Manufacture curtains of one piece, sized 10 percent wider than track length. Terminate curtain 12 inches from floor.
    - b. Include open mesh cloth at top 12 inches of curtain for room air circulation.
    - c. 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.
  7. Products:
    - a. Moderate by Maharam: [www.maharam.com](http://www.maharam.com).

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify that surfaces and supports above ceiling are ready to receive work of this Section.

### **3.02 INSTALLATION**

- A. Install curtain track to be secure, rigid, and true to ceiling line.
- B. Install end cap and stop device.
- C. Secure track to ceiling system. Coordinate additional supports required to properly support system.
- D. Install curtains on carriers ensuring smooth operation.

### **3.03 SCHEDULES**

- A. Nurse's Room.

**END OF SECTION**

## SLIDING PANEL PARTITIONS

### PART 1 GENERAL

#### 1.01 SECTION INCLUDES

- A. Folding panel partitions.
- B. Acoustic operable panel partition.
- C. Ceiling track, ceiling guards, and operating hardware.

#### 1.02 RELATED REQUIREMENTS

- A. Section 05 12 00 - Structural Framing: Overhead track structural support framing.

#### 1.03 REFERENCE STANDARDS

- A. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2014.
- B. ASTM E557 - Standard Guide for Architectural Design and Installation Practices for Sound Isolation between Spaces Separated by Operable Partitions; 2012.

#### 1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on partition materials.
- C. Shop Drawings: Indicate opening sizes, track layout, details of track and required supports, and stacking depth.
- D. Samples for Review: Submit two samples of surface finish, 12 x 12 inches size, illustrating quality.
- E. Manufacturer's Instructions: Indicate special procedures.
- F. Maintenance Data: Include recommended cleaning methods, cleaning materials, and stain removal methods. Describe cleaning materials detrimental to finish surfaces and hardware finish.

#### 1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified this section with minimum three years of documented experience.
- B. Installer Qualifications: Company specializing in performing work of this section with minimum three years of experience.

#### 1.06 PROJECT CONDITIONS

- A. Coordinate the work with other sections providing panel finish materials to this section.

#### 1.07 WARRANTY

- A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.
- B. System Warranty: Provide manufacturer's system warranty agreement to repair or replace components with manufacturing or workmanship defects; include readjusting for proper operation.
  1. Warranty Term: 2 years.

### PART 2 PRODUCTS

#### 2.01 MANUFACTURERS

- A. Design is based on Modernfold, Inc; Product Acousti-Seal Encore: [www.modernfold.com](http://www.modernfold.com).
- B. Other Acceptable Manufacturers:

1. Hufcor, Inc: [www.hufcor.com](http://www.hufcor.com).
2. Panelfold, Inc: [www.panelfold.com](http://www.panelfold.com).
3. Substitutions: See Section 01 60 00 - Product Requirements.

## 2.02 COMPONENTS

- A. Sliding Panel Partition: Side opening; individual panels; side stacking; manually operated; panel widths as indicated on Drawings.
  1. Panel Finish:
    - a. Drama/Platform to Commons:
      - 1) Drama/Platform Face: Guilford of Maine fabric , 2100 FR701, 408 Black.
      - 2) Commons Face: Carnegie Xorel fabric, pattern Strie 6423 color 814, backing on door must be white behind this fabric.
    - b. Drama/Platform to Choral:
      - 1) Drama/Platform Face: Guilford of Maine fabric, 2100 FR701, 408 Black.
      - 2) Choral Face: Carnegie Xorel fabric, pattern Strie 6423 color 814, backing on door must be white behind this fabric
  2. Sound Transmission Class (STC): Calculated in accordance with ASTM E413, based on tests conducted in accordance with ASTM E90, on panel size of 100 sq ft:
    - a. Drama/Platform to Commons: 54 STC.
    - b. Drama/Platform to Choral: 56 STC, minimum.
  3. Surface Burning Characteristics of Panel Finish: Flame spread/Smoke developed index of 25/50, maximum, when tested in accordance with ASTM E84.
  4. Installed partition system track capable of supporting imposed loads, with maximum deflection of 1/360 of span.
- B. Panel Construction:
  1. Skin: Formed rolled steel construction utilizing manufacturer's standard fabrication methods.
  2. Core: 16 gage, 0.0598 inch thick formed sheet steel frame top, bottom, jambs, and intermediates; welded construction, with acoustical insulation fill.
  3. Thickness with Finish: Nominal 4-1/4 inches.
  4. Factory applied surface finish.
  5. Trim: Trimless.
  6. Hinges: Full leaf butt type, roll-formed steel.
  7. Panel to Panel Seals: Grooved and gasketed astragals; continuous flexible ribbed vinyl seal fitted to panel edge construction; color to match panel finish.
  8. Horizontal Top Seals: Automatic operable top seal.
  9. Horizontal Bottom Seals (Modernfold SM2 Bottom Seal): Manually activated bottom seal with self contained handle, nominal 2 inch operating clearance, operable from each panel face; adjustable to compensate for variations in floor; extended seal to exert nominal 120 pounds downward force to floor.
- C. Final Closure: Horizontally expanding panel edge with removable crank.
- D. Track: Formed steel; 2-1/8 x 2-1/2 inches size; thickness and profile designed to support loads, steel sub-channel and track connectors, track switches, aluminum track is not acceptable.
- E. Exposed Track Soffit: Steel, integral to track, and pre-painted off-white color.
- F. Carriers: Ball bearing, steel wheels on trolley carrier at top of every second panel, sized to carry imposed loads, with threaded pendant bolt for vertical adjustment.
- G. Acoustic Seals: Flexible acoustic seals at jambs, meeting mullions, ceilings, retractable floor and ceiling seals, and above track to structure acoustic seal.
- H. Markerboard: Dry-erase type, white enamel on steel, bonded to the face of panel with horizontal trim without exposed fasteners. Trim is not acceptable on vertical surfaces to provided uninterrupted surface finish; matte white finish.
- I. Fabric: As specified above.

**PART 3 EXECUTION****3.01 EXAMINATION**

- A. Verify that field measurements are as indicated.
- B. Verify track supports are laterally braced and will permit track to be level within 1/4 inch of required position and parallel to the floor surface.
- C. Verify floor flatness of 1/8 inch in 10 feet, non-cumulative.
- D. Verify wall plumbness of 1/8 inch in 10 feet, non-cumulative.

**3.02 INSTALLATION**

- A. Install partition in accordance with manufacturer's instructions and ASTM E557.
- B. Fit and align partition assembly level and plumb.
- C. Lubricate moving components.
- D. Apply acoustic sealant to achieve required acoustic performance.
- E. Install one foot bolt at the trail end (storage end) on each half of a sliding panel. Install on the Gymnasium side.

**3.03 ADJUSTING**

- A. Adjust partition assembly to provide smooth operation from stacked to full open position. Do not over-compress acoustic seals.
- B. Visually inspect partition in full extended position for light leaks to identify a potential acoustical leak.
- C. Adjust partition assembly to achieve lightproof seal.

**3.04 CLEANING**

- A. Clean finish surfaces and partition accessories.

**3.05 CLOSEOUT ACTIVITIES**

- A. See Section 01 79 00 - Demonstration and Training.
- B. Demonstrate operation of partition, identify potential operational problems.

**END OF SECTION**

## WALL AND CORNER GUARDS

### PART 1 GENERAL

#### 1.01 SECTION INCLUDES

- A. Corner guards.

#### 1.02 RELATED REQUIREMENTS

- A. Section 09 21 16 - Gypsum Board Systems: Wall construction.
- B. Section 04 27 31 - Reinforced Unit Masonry: Wall construction.

#### 1.03 REFERENCE STANDARDS

- A. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2010.

#### 1.04 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. Manufacturer's Instructions: Indicate special procedures, perimeter conditions requiring special attention .

### PART 2 PRODUCTS

#### 2.01 MANUFACTURERS

- A. Wall and Corner Guards:
  - 1. Construction Specialties, Inc: [www.c-sgroup.com](http://www.c-sgroup.com).
  - 2. InPro: [www.inprocorp.com](http://www.inprocorp.com).
  - 3. Substitutions: See Section 01 60 00 - Product Requirements.

#### 2.02 COMPONENTS

- A. Corner Guards - Surface Mounted: One-piece unit without splices, installed with adhesive.
  - 1. Material: Type 304 stainless steel, No. 4 finish.
  - 2. Thickness: 18 gage, 0.05 inch.
  - 3. Width of Wings: 3-1/2 inches.
  - 4. Styles: Provide 90 degree corners and wall end protectors.

#### 2.03 FABRICATION

- A. Fabricate components with tight joints, corners and seams.

### 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, secured rigidly in position to wall framing members only.
- B. Position corner guard at 4 inches (at top of wall base) above finished floor to 48 inches high or as indicated on Drawings.



**3.03 TOLERANCES**

- A. Maximum Variation From Required Height: 1/4 inch.
- B. Maximum Variation From Level or Plane For Visible Length: 1/4 inch.

**END OF SECTION**

## TOILET, BATH, AND LAUNDRY ACCESSORIES

### PART 1 GENERAL

#### 1.01 SECTION INCLUDES

- A. Accessories for toilet rooms, showers, and utility rooms.
- B. Electric hand/hair dryers.
- C. Grab bars.
- D. Installation of Owner furnished items.

#### 1.02 RELATED REQUIREMENTS

- A. Section 01 10 00 - Summary: Owner Furnished Contractor Installed Items.
- B. Section 04 27 31 - Reinforced Unit Masonry: Wall substrate.
- C. Section 09 21 16 - Gypsum Board Assemblies: Concealed supports for accessories, including in wall framing and plates, above ceiling framing, and blocking and backing for attachments.
- D. Section 09 30 00 - Tiling: Ceramic washroom accessories.
- E. Section 10 21 13.16 - Solid Phenolic Toilet and Shower Compartments: Partition systems.

#### 1.03 REFERENCE STANDARDS

- A. ASTM A269/A269M - Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service; 2014e1.
- B. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2013.
- C. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2010.
- D. ASTM C1036 - Standard Specification for Flat Glass; 2011e1.
- E. ASTM C1503 - Standard Specification for Silvered Flat Glass Mirror; 2008 (Reapproved 2013).

#### 1.04 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.
- C. Samples: Submit two samples of each accessory, illustrating color and finish.
- D. Manufacturer's Installation Instructions: Indicate special procedures and conditions requiring special attention.

#### 1.05 COORDINATION

- A. Coordinate the work with the placement of internal wall reinforcement, concealed ceiling supports, and reinforcement of toilet partitions to receive anchor attachments.

### PART 2 PRODUCTS

#### 2.01 MANUFACTURERS

- A. Products listed are made by Bobrick Washroom Equipment Inc: [www.bobrick.com](http://www.bobrick.com) .
- B. Other Acceptable Manufacturers:
  - 1. A & J Washroom Accessories Inc: [www.ajwashroom.com](http://www.ajwashroom.com).
  - 2. American Specialties, Inc: [www.americanspecialties.com](http://www.americanspecialties.com).

3. Bradley Corporation: [www.bradleycorp.com](http://www.bradleycorp.com).
4. Substitutions: See 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.
- B. Stainless Steel Sheet: ASTM A666, Type 304.
- C. Stainless Steel Tubing: ASTM A269, Type 304 or 316.
- D. Galvanized Sheet Steel: Hot-dipped galvanized steel sheet, ASTM A653/A653M, 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, security type.
- H. Expansion Shields: Fiber, lead, or rubber as recommended by accessory manufacturer for component and substrate.

## 2.03 TOILET ROOM ACCESSORIES

- A. Toilet Paper Dispenser: Surface mounted type; Owner furnished.
- B. Paper Towel Dispenser: Wall mounted type; Owner furnished.
- C. Electric Hand Dryers: Traditional fan-in-case type, with downward nozzle.
  1. Operation: Automatic, sensor-operated on and off.
  2. Style: Air blade type, fixed nozzles.
  3. Mounting: Surface mounted.
  4. Cover: Polycarbonate ABS plastic.
    - a. Color: Nickel.
    - b. Tamper-resistant screw attachment of cover to mounting plate.
  5. Capacity: Up to 7.39 gal/sec and up to 59.3 CFM
  6. Total Wattage: 1400 W, maximum.
  7. Voltage: 110 volt.
  8. Warranty: 3 years.
  9. Products:
    - a. Dyson Airblade V, AB12: [www.airblade.dyson.com](http://www.airblade.dyson.com).
    - b. Substitutions: Section 01 60 00 - Product Requirements.
- D. Waste Receptacle: Free-standing type; Owner furnished.
- E. Soap Dispenser: Wall mounted type; Owner furnished.
- F. Mirrors: Stainless steel framed, 6 mm thick float glass mirror.
  1. Annealed Float Glass: Silvering, protective and physical characteristics in compliance with ASTM C1503.
  2. Sizes: As indicated on Drawings.
  3. Frame: 1/2 inch x 1/2 inch x 1/4 inch channel shapes, with mitered and welded and ground corners, and tamperproof hanging system; No.4 finish.
  4. Backing: Full-mirror sized, minimum 0.03 inch galvanized steel sheet and nonabsorptive filler material.
  5. Product:
    - a. B-1658 Series by Bobrick Washroom Equipment Inc: [www.bobrick.com](http://www.bobrick.com).
    - b. Substitutions: See Section 01 60 00 - Product Requirements.

- G. Seat Cover Dispenser: Surface mounted type; Owner furnished.
- H. Grab Bars: Stainless steel, nonslip grasping surface finish.
- I. Grab Bars: Stainless steel, 1-1/2 inches outside diameter, minimum 0.05 inch wall thickness, nonslip grasping surface finish, concealed flange mounting; 1-1/2 inches clearance between wall and inside of grab bar.
  - 1. Product:
    - a. B-6806 Series by Bobrick Washroom Equipment Inc: [www.bobrick.com](http://www.bobrick.com).
    - b. Substitutions: See Section 01 60 00 - Product Requirements.

#### 2.04 SHOWER AND TUB ACCESSORIES

- A. Shower Curtain Rod: Stainless steel tube, 1-1/4 inch outside diameter, 0.04 inch wall thickness, satin-finished, with 3 inch outside diameter, minimum 0.04 inch thick satin-finished stainless steel flanges, for concealed mounting.
  - 1. Product:
    - a. Model B-6047 by Bobrick Washroom Equipment Inc: [www.bobrick.com](http://www.bobrick.com).
    - b. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Shower Curtain:
  - 1. Material: Opaque vinyl, 0.008 inch thick, matte finish, with antibacterial treatment, flame-retardant and stain-resistant.
  - 2. Size:
    - a. SC-A: 42 x 72 inch, hemmed edges.
  - 3. Grommets: Stainless steel; pierced through top hem on 6 inch centers.
  - 4. Color: As selected from manufacturer's standard colors.
  - 5. Shower curtain hooks: Chrome-plated or stainless steel spring wire designed for snap closure.
  - 6. Product:
    - a. Model 204-2 by Bobrick Washroom Equipment Inc: [www.bobrick.com](http://www.bobrick.com).
    - b. Substitutions: See Section 01 60 00 - Product Requirements.
- C. Folding Shower Seat: Wall-mounted recessed; welded tubular seat frame, structural support members, hinges and mechanical fasteners of Type 304 stainless steel, L-shaped seat.
  - 1. Seat: Phenolic or polymeric composite one-piece seat or seat slats, of color as selected.
  - 2. Product:
    - a. Model B-5181 by Bobrick Washroom Equipment Inc: [www.bobrick.com](http://www.bobrick.com).
    - b. Substitutions: See Section 01 60 00 - Product Requirements.
- D. Robe Hook: Heavy-duty stainless steel, single-prong, rectangular-shaped bracket and backplate for concealed attachment, satin finish.
  - 1. Product:
    - a. B-6717 by Bobrick Washroom Equipment Inc: [www.bobrick.com](http://www.bobrick.com).
    - b. Substitutions: See Section 01 60 00 - Product Requirements.

#### 2.05 UTILITY ROOM ACCESSORIES

- A. Combination Utility Shelf/Mop and Broom Holder: 0.05 inch thick stainless steel, Type 304, with 1/2 inch returned edges, 0.06 inch steel wall brackets.
  - 1. Drying rod: Stainless steel, 1/4 inch diameter.
  - 2. Hooks: 2, 0.06 inch stainless steel rag hooks at shelf front.
  - 3. Mop/broom holders: 3 spring-loaded rubber cam holders at shelf front.
  - 4. Length: Manufacturer's standard length for number of holders/hooks.
  - 5. Product:
    - a. Model B-224 by Bobrick Washroom Equipment Inc: [www.bobrick.com](http://www.bobrick.com).
    - b. Substitutions: See Section 01 60 00 - Product Requirements.

**PART 3 EXECUTION**

**3.01 EXAMINATION**

- A. Verify existing conditions before starting work.
- B. Verify exact location of accessories for installation.
- C. For electrically-operated accessories, verify that electrical power connections are ready and in the correct locations.
- D. Verify that field measurements are as indicated on drawings.

**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: As required by accessibility regulations, unless otherwise indicated.
- D. Mounting Heights and Locations: As required by accessibility regulations, as indicated on drawings, and as follows:

**3.04 PROTECTION**

- A. Protect installed accessories from damage due to subsequent construction operations.

**END OF SECTION**

**FIRE PROTECTION SPECIALTIES****PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Installation of Owner Furnished fire extinguishers (OFCI).
- B. Fire extinguisher cabinets.
- C. Fire extinguisher brackets.
- D. Accessories.

**1.02 RELATED REQUIREMENTS**

- A. Section 01 10 00 - Summary: Description of Owner Furnished Contractor Installed items.
- B. Section 09 21 16 - Gypsum Board Assemblies: Wall backing.

**1.03 REFERENCE STANDARDS**

- A. UL (FPED) - Fire Protection Equipment Directory; Underwriters Laboratories Inc.; current edition.

**1.04 PERFORMANCE REQUIREMENTS**

- A. Conform to NFPA 10.
- B. Provide extinguishers classified and labeled by Underwriters Laboratories Inc. for the purpose specified and indicated.

**1.05 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Indicate cabinet physical dimensions, rough-in measurements for recessed cabinets, wall bracket mounted measurements, and color and finish.
- C. Manufacturer's Installation Instructions: Indicate special criteria and wall opening coordination requirements.

**1.06 FIELD CONDITIONS**

- A. Do not install extinguishers when ambient temperature may cause freezing of extinguisher ingredients.

**PART 2 PRODUCTS****2.01 MANUFACTURERS**

- A. Fire Extinguisher Cabinets:
  1. JL Industries, Inc: [www.jlindustries.com](http://www.jlindustries.com).
  2. Larsen's Manufacturing Co: [www.larsensmfg.com](http://www.larsensmfg.com).
  3. Substitutions: See Section 01 60 00 - Product Requirements.

**2.02 FIRE EXTINGUISHER CABINETS**

- A. Metal: Formed stainless steel sheet; 0.036 inch thick base metal.
- B. Cabinet Configuration: Recessed type.
  1. Interior nominal dimensions of 9 inch wide x 18 inch high x 5-1/2 inch deep.
  2. Trim: Flat, 1 inch wide face.
- C. Door: 0.036 inch thick, reinforced for flatness and rigidity; latch. Hinge doors for 180 degree opening with two butt hinge. Provide nylon catch.
- D. Door Glazing: Plastic, clear, 1/8 inch thick acrylic. Set in resilient channel gasket glazing.

- E. Finish of Cabinet Exterior Trim and Door: Baked enamel, white color.
- F. Finish of Cabinet Interior: White enamel.

**2.03 ACCESSORIES**

- A. Extinguisher Brackets: Formed steel, galvanized and enamel finished.

**PART 3 EXECUTION**

**3.01 EXAMINATION**

- A. Verify existing conditions before starting work.

**3.02 INSTALLATION**

- A. Install in accordance with manufacturer's instructions.
- B. Install cabinets plumb and level in wall openings, at height indicated on Drawings and to comply with ADA.
- C. Secure wall mounted brackets rigidly in place.
- D. Place extinguishers on wall brackets.

**3.03 SCHEDULES**

- A. Install wall mounted fire extinguishers in the following locations:
  - 1. Kitchen.
  - 2. Mechanical Room.
- B. Install recessed wall cabinets and fire extinguishers as indicated on Drawings.

**END OF SECTION**

## LOCKERS

### PART 1 GENERAL

#### 1.01 SECTION INCLUDES

- A. Metal lockers.
- B. Hallway wardrobe locker units with hinged doors.
- C. Locker room units with hinged doors.
- D. Metal tops and filler panels.
- E. Locker benches.

#### 1.02 RELATED REQUIREMENTS

- A. Section 03 30 00 - Cast-in-Place Concrete: Concrete base construction.

#### 1.03 REFERENCE STANDARDS

- A. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2013.

#### 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 and accessories.
- C. Shop Drawings: Indicate locker plan layout, numbering plan and combination lock code.
- D. Samples: Submit two samples 3 x 6 inches in size, of each color scheduled.
- E. Manufacturer's Installation Instructions: Indicate component installation assembly.

#### 1.05 DELIVERY, STORAGE, AND HANDLING

- A. Protect locker finish and adjacent surfaces from damage.

### PART 2 PRODUCTS

#### 2.01 MANUFACTURERS

- A. Metal Lockers:
  1. List Industries Inc: [www.listindustries.com](http://www.listindustries.com).
  2. Penco Products, Inc: [www.pencoproducts.com](http://www.pencoproducts.com).
  3. Substitutions: See Section 01 60 00 - Product Requirements.

#### 2.02 METAL LOCKERS

- A. Lockers: Factory assembled, made of formed sheet steel, ASTM A653/A653M SS Grade 33/230, with G60/Z180 coating, stretcher leveled; metal edges finished smooth without burrs; baked enamel finished inside and out.
  1. Color: As noted below.
- B. Locker Body: Formed and flanged; with steel stiffener ribs; electric spot welded.
  1. Body and Shelves: 24 gage, 0.0239 inch.
- C. Frames: Formed channel shape, welded and ground flush, welded to body, resilient gaskets and latching for quiet operation.
  1. Door Frame: 16 gage, 0.0598 inch, minimum.
- D. Doors (Hallway Lockers): Hollow channel edge construction, 1-3/16 inch thick; welded construction, channel reinforced top and bottom with intermediate stiffener ribs, grind and finish edges smooth.



1. Door Outer Face: 18 gage, 0.0478 inch, minimum.
  2. Form recess for operating handle and locking device.
  3. Provide louvers in door face, top and bottom, for ventilation.
- E. Doors (Locker Room): Hollow channel edge construction, 1-3/16 inch thick; welded construction, channel reinforced top and bottom with intermediate stiffener ribs, grind and finish edges smooth.
1. Door Outer Face: 14 gage, 0.0747 inch.
  2. Provision for operating handle and locking device.
  3. Expanded metal face, diamond perforations for ventilation.
- F. Hinges: Two for doors under 42 inches high; three for doors over 42 inches high; weld securely to locker body and door.
1. Hinge Thickness: 14 gage, 0.0747 inch.
- G. Sloped Top: 20 gage, 0.0359 inch, with closed ends.
- H. Trim: 20 gage, 0.0359 inch.
- I. Coat Hooks: Stainless steel or zinc-plated steel.
- J. Number Plates: Provide oval shaped brass plates. Form numbers 1 inch high of block font style with ADA designation, in contrasting color.
- K. Locks (Hallway Lockers): Integral combination locks; resettable; master key access control.
- L. Locks (Locker Rooms): User furnished pad locks.
- M. Keyless Lock (ADA units): Electronic push button access control; ADA compliant.
1. Model DK-ATS with integral pull by Digilock.
  2. Substitutions: See Section 01 60 00 - Product Requirements.

### **2.03 HALLWAY WARDROBE LOCKER UNITS**

- A. Size:
1. Width: 15 inches.
  2. Depth: 15 inches.
  3. Height: 72 inches.
- B. Configuration: double tier.
- C. Mounting: Surface mounted and surface mounted.
- D. Base: Metal base.
1. Base Height: 4 inch.
- E. Top: Sloped.
- F. Locking: Equipped for built-in combination locks.
- G. Ventilation Method: Louvered top and bottom frame and top and bottom of door.
- H. Class: Quiet.
- I. Accessories: Two single prong wall hooks, hat shelf.
- J. ADA Accessible Lockers: 5 percent of total number of lockers indicated on Drawings; locate where directed by Owner.
- K. Colors: To match List Industries colors as noted below.
1. Base: 717 Grand Slam.
  2. Doors:
    - a. Color 1: 717 Grand Slam.
    - b. Color 2: 722 Tidal Wave.
    - c. Color 3: 733 Frolic.

**2.04 LOCKER ROOM LOCKER UNITS**

- A. Size:
  - 1. Width: 12 inches.
  - 2. Depth: 15 inches.
  - 3. Height: 72 inches.
- B. Configuration: Three tier.
- C. Mounting: Surface mounted and surface mounted.
- D. Base: Fabricate for concrete base.
  - 1. Base Height: 4 inch.
- E. Top: Sloped.
- F. Locking: Equipped for padlock hasps.
- G. Ventilation Method: Perforated face.
- H. Class: Conventional.
- I. Accessories: None.
- J. ADA Accessible Lockers: 5 percent of total number of lockers indicated on Drawings; locate where directed by Owner.
- K. Color: To match List Industries colors as note below.
  - 1. Frame and Doors: 721 Relay Red.

**2.05 FABRICATION**

- A. Locker Body: Formed and flanged; with steel stiffener ribs; electric spot welded.
- B. Frames: Formed channel shape, welded and ground flush, welded to body, resilient gaskets and latching for quiet operation.
- C. Doors: Hollow channel edge construction, 1-3/16 inch thick; welded construction, channel reinforced top and bottom with intermediate stiffener ribs, grind and finish edges smooth.
- D. Hinges: Two for doors under 42 inches high; three for doors over 42 inches high; weld securely to locker body and door.
- E. Locking device supplied by Owner; except at noted otherwise.
- F. Number Plates: Provide rectangular shaped brass plates. Form numbers 1/2 to 3/4 inch high of block font style with ADA designation, in contrasting color.
- G. Provide ventilation openings at top and bottom of each locker door at wardrobe and SWAT lockers.
- H. Form recess for operating handle and locking device.
- I. Finish edges smooth without burrs.
- J. Fabricate sloped metal tops, ends and closure pieces.
- K. Provide end panels and filler strips.

**2.06 FINISHING**

- A. Clean, degrease, and neutralize metal; prime and finish with one coat of baked enamel.
- B. Paint locker bodies and doors in contrasting colors.

**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, filler panels, and sloped tops.
- G. Install accessories.
- H. Replace components that do not operate smoothly.

**3.03 CLEANING**

- A. Clean locker interiors and exterior surfaces.

**END OF SECTION**

**METAL STORAGE SHELVING****PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Metal storage shelving.
- B. Shelving accessories.

**1.02 RELATED REQUIREMENTS**

- A. Section 03 30 00 - Cast-In-Place Concrete: Floor support.
- B. Section 09 21 16 - Gypsum Board Assemblies: Blocking and reinforcement in walls for anchoring shelving units.

**1.03 REFERENCE STANDARDS**

- A. ANSI MH28.1 - American National Standard for the Design, Testing, Utilization and Application of Industrial Grade Steel Shelving - Specifications; 1997.
- B. ASCE 7 - Minimum Design Loads for Buildings and Other Structures; American Society of Civil Engineers; 2011.

**1.04 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
  - 1. Rated uniform shelf loads.
  - 2. Details of shelving assemblies, including reinforcement.
  - 3. Accessories.
  - 4. Substrate preparation instructions and recommendations.
  - 5. Storage and handling requirements and recommendations.
  - 6. Installation methods.
- C. Test Reports: Provide independent agency test reports documenting compliance with specified structural requirements.
  - 1. In lieu of test reports, detailed drawings stamped and sealed by a Professional Engineer licensed in Oregon will be acceptable.
- D. Shop Drawings: Indicate location, type, and layout of shelving, including lengths, heights, and aisle layout, and relationship to adjacent construction.
  - 1. Indicate methods of achieving specified anchoring requirements.

**1.05 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years of documented experience.
- B. Installer Qualifications: Company specializing in performing the work of this section with minimum three years of documented experience and approved by manufacturer.

**1.06 DELIVERY, STORAGE, AND HANDLING**

- A. Inspect for dents, scratches, or other damage. Replace damaged units.
- B. Store in manufacturer's unopened packaging until ready for installation.
- C. Store under cover and elevated above grade.

**PART 2 PRODUCTS****2.01 MANUFACTURERS**

- A. Four Post Shelving:
  1. Hallowell, Division of List Industries, Inc : [www.hallowell-list.com](http://www.hallowell-list.com).
  2. Penco Products, Inc : [www.pencoproducts.com](http://www.pencoproducts.com).
  3. SpaceSaver Corporation : [www.spacesaver.com](http://www.spacesaver.com).
  4. Tennsco: [www.tennsco.com](http://www.tennsco.com).

**2.02 SHELVING - GENERAL**

- A. See drawings for layout and sizes.
- B. Shelving: Provide products tested to comply with ANSI MH28.1 for design criteria, lateral stability, shelf connections, and shelf capacity.
- C. Seismic Design: Design for Seismic Zone 3, in accordance with ASCE 7, Section 9.
- D. Anchors: Provide anchoring hardware to secure each shelving unit to floor and wall.
  1. Provide hardware of type recommended by manufacturer for substrate.

**2.03 FOUR POST SHELVING**

- A. Four Post Shelving: Steel post-and-beam type with sway bracing, shelving brackets, shelving surfaces, and accessories as specified.
  1. Unit Width: 48 inches, center to center of posts.
  2. Shelf Capacity: Rated uniform load of 50 psf, minimum, tested in accordance with ANSI MH28.1.
  3. Shelf Deflection: 1/4 inch in 48 inches, maximum, under rated uniform load.
  4. Adjustability of Shelving: At intervals of 1-1/2 inches on center, minimum.
  5. Shelf Depth: 24 inches, or as indicated on Drawings.
  6. Shelves per Unit: 4.
  7. Unit Height: 84 inches, overall .
  8. Finish: Baked enamel, medium gloss.
  9. Color: Manufacturer's standard gray.
  10. Number of Units: As indicated on drawings.
- B. Posts and Beams: Formed sheet members; perforations exposed on face of members are not acceptable.
  1. Metal Thickness: 16 gage, 0.0598 inch.
  2. Post Shape: Tee intermediate posts, angle end posts forming corners.
  3. Post Face Width: 2 inches, maximum.
  4. Connecting Hardware: Manufacturer's standard.
- C. Bracing: Formed sheet members.
  1. Back Sway Bracing: Either strap or panel; at back of each unit.
  2. Side Sway Bracing: Either strap or panel; at each side of each unit.
  3. Strap Sway Bracing: One strap installed diagonally, 16 gage, 0.0598 inch; welded, riveted, or bolted to uprights.
  4. Panel Sway Bracing: Formed sheet metal panels, 20 gage, 0.0359 inch; welded, riveted, or bolted to uprights.
- D. Shelves: Formed sheet, finished on all surfaces, with slots for dividers.
  1. Metal Thickness: 16 gage, 0.0598 inch.
  2. Shelf Connection to Posts: Manufacturer's standard.

**PART 3 EXECUTION****3.01 EXAMINATION**

- A. Verify that substrate is level and that clearances are as specified.

- B. Verify that walls are suitable for shelving attachment.
- C. Do not begin installation until substrates have been properly prepared.
- D. If substrate preparation is the responsibility of another installer, notify Contractor 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 instructions.
- B. Anchor and reinforce as specified, as indicated on drawings, and as recommended by manufacturer.
- C. Install shelving with shelf surfaces level and vertical supports plumb; adjust feet and bases as required.
- D. Out-Of-Square Tolerance - Four Post Shelving: Maximum of 1/8 inch difference in distance between bottom shelf and canopy top, measured along any post in any direction.

**3.04 PROTECTION**

- A. Protect installed products until completion of project.
- B. Touch-up, repair or replace damaged products before Substantial Completion.

**3.05 SCHEDULE**

- A. Locate shelving as follows:
  - 1. Storage 152A, 152B, 152C: 4 units each room.
  - 2. Storage 154A, 154B, 154C: 4 units each room.
  - 3. Custodial Storage 177: 6 units.

**END OF SECTION**

## FLAGPOLES

### PART 1 GENERAL

#### 1.01 SECTION INCLUDES

- A. Aluminum Flagpoles.

#### 1.02 RELATED REQUIREMENTS

- A. Section 03 30 00 - Cast-In-Place Concrete: Concrete base and foundation construction.

#### 1.03 REFERENCE STANDARDS

- A. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2013.
- B. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes [Metric]; 2013.

#### 1.04 PERFORMANCE REQUIREMENTS

- A. Flagpole With Flag Flying: Resistant without permanent deformation to 90 miles/hr wind velocity; nonsafety design factor of 2.5.
- B. Flagpole Without Flag: Resistant without permanent deformation to 90 miles/hr wind velocity; nonsafety design factor of 2.5.

#### 1.05 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on pole, accessories, and configurations.
- C. Shop Drawings: Indicate detailed dimensions, base details, anchor requirements, and imposed loads.

#### 1.06 QUALITY ASSURANCE

- A. Designer Qualifications: Design flagpole supports under direct supervision of a Professional Structural Engineer experienced in design of this Work and licensed Oregon.

#### 1.07 DELIVERY, STORAGE, AND HANDLING

- A. Spiral wrap flagpole with protective covering and pack in protective shipping tubes or containers.
- B. Protect flagpole and accessories from damage or moisture.

### PART 2 PRODUCTS

#### 2.01 MANUFACTURERS

- A. Flagpoles:
  1. American Flagpole: [www.americanflagpole.com](http://www.americanflagpole.com).
  2. Concord Industries, Inc: [www.concordindustries.com](http://www.concordindustries.com).
  3. Pole-Tech Co., Inc: [www.poletech.com](http://www.poletech.com).
  4. Eagle Mountain Flag & Flagpole Company: [www.eaglemountainflag.com](http://www.eaglemountainflag.com).
  5. Substitutions: See Section 01 60 00 - Product Requirements.

#### 2.02 FLAGPOLES

- A. Flagpoles: Aluminum.
  1. Design: Straight shaft.
  2. Mounting: Ground mounted type.
  3. Outside Butt Diameter: 8 inches.
  4. Outside Tip Diameter: 3-1/2 inches.

5. Nominal Wall Thickness: 0.156 inches.
6. Nominal Height: 35; measured from nominal ground elevation.
7. Mounting: Ground mounted type.
8. Design: Cone tapered.
9. Halyard: External type .

**B. Performance Requirements:**

1. Flagpole With Flag Flying: Resistant without permanent deformation to 75 miles/hr wind velocity; non-resonant, safety design factor of 2.5.
2. Flagpole Without Flag: Resistant without permanent deformation to 75 miles/hr wind velocity; non-resonant, safety design factor of 2.5.

**2.03 POLE MATERIALS**

- A. Aluminum: ASTM B221 (ASTM B221M), 6063 alloy, T6 temper.

**2.04 ACCESSORIES**

- A. Finial Ball: Aluminum, 6 inch diameter; gold anodized finish.
- B. Truck Assembly: Cast aluminum; revolving, stainless steel ball bearings, non-fouling.
- C. Flag: American design, 10 x 6 inch size, embroidered nylon fabric, brass grommets, hemmed edges. Similar to Part Number FLAG-US-06 by American Flagpole.
- D. Cleats: 9 inch size, aluminum with galvanized steel fastenings, two per halyard.
- E. Cleat Box: Aluminum, with built-in hinge and hasp assembly, attached to pole with tamper proof screws inside box.
- F. Halyard: 5/16 inch diameter polypropylene, braided, white.

**2.05 MOUNTING COMPONENTS**

- A. Foundation Tube Sleeve: AASHTO M 36M, corrugated 16 gage, 0.0598 inch steel, galvanized, depth as required.

**2.06 FINISHING**

- A. Metal Surfaces in Contact With Concrete: Asphaltic paint.
- B. Aluminum: Mill finish.
- C. Finial: Spun finish.

**PART 3 EXECUTION**

**3.01 EXAMINATION**

- A. Verify that wall supports are ready to receive work and dimensions are as indicated on shop drawings.

**3.02 INSTALLATION**

- A. Install flagpole and fittings in accordance with manufacturer's instructions.
- B. Set brackets for wall set flagpoles anchored securely into wall construction. Seal watertight.

**3.03 TOLERANCES**

- A. Maximum Variation From Plumb: 1 inch.



**3.04 ADJUSTING**

- A. Adjust operating devices so that halyard and flag function smoothly.

**END OF SECTION**

## ROOF MOUNTED FALL PROTECTION

### PART 1 GENERAL

#### 1.01 SECTION INCLUDES

- A. Tie back lifeline anchors.

#### 1.02 RELATED SECTIONS

- A. Section 01 62 11 - Delegated Design.
- B. Section 06 10 00 - Rough Carpentry: Roof sheathing and blocking.
- C. Section 07 54 00 - Thermoplastic Membrane Roofing: Roofing system.

#### 1.03 REFERENCES

- A. AISC - American Institute for Steel Construction
- B. ANSI - American National Standards Institute
- C. AWS D1.1 - Structural Welding Code

#### 1.04 DESIGN CRITERIA

- A. Design support and fall protection systems in accordance with following standards:
  1. Federal OSHA Standard 1910.66, subpart D (Walking and Working Surfaces)
  2. Federal OSHA Standard 1910.66, Appendix C (Personal Fall Arrest Systems)
  3. Department of Labor, Memorandum to Regional Administrators, Descent Control Devices.
- B. Comply with following standards:
  1. AISC - Load and Resistance Factor Design Specifications for Structural Steel Buildings.
  2. ANSI - Specification for Design of Cold-Formed Steel Structural Members (1986 and 1989 Addendum).
- C. Welding: Comply with AWS D1.1.

#### 1.05 SUBMITTALS FOR REVIEW

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Indicate layout, sizes, connection attachments, anchorage, size and type of fastening, and accessories.
- C. Product Data: Component details, finishes, sizes, and shape; structural capacities.
- D. Delegated Design Data: As required by authorities having jurisdiction.
- E. Certification: Submit manufacturer's certification that system and components have been field verified and meet requirements specified in this Section.
- F. Field Reports: Submit manufacturer's field reports certifying installation.

#### 1.06 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in design and fabrication of fall protection systems with minimum five years documented experience.
- B. Installer Qualifications: Company specializing in performing Work of this section with minimum five years documented experience. Approved by equipment manufacturer.

#### 1.07 COORDINATION

- A. Coordinate with installation of roof systems in Sections 07 54 00 - Thermoplastic Membrane Roofing, to achieve weather tight installation.

## **PART 2 PRODUCTS**

### **2.01 TIE BACK LIFELINE ANCHORS**

- A. System: Roof mounted safety anchor system consisting of galvanized high strength steel base plate and sleeve, and stainless steel "U" bar. Integral flashing system compatible with roofing systems specified.
  - 1. Welded connection to structural roof framing.
  - 2. Cast anchor connection to structural cast-in-place concrete.
- B. Capacity: Minimum 5,000 pound capacity applied in any direction.
- C. Labeling: Provide non-corrosive data plates stating maximum service capacity of system.
- D. Approved Products:
  - 1. Model PBE-75S, U-Bar Safety Anchor by Pro-Bel: [www.pro-bel.ca](http://www.pro-bel.ca)
  - 2. Substitutions: See Section 01 60 00 - Product Requirements.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify structural components are ready to receive installation of restraint system.

### **3.02 INSTALLATION**

- A. Install components in accordance with manufacturer's recommendations.
- B. Install components true, level, tightly fitted, and flush with adjacent surfaces.
- C. Provide flashing for weather tight installation with roofing system.

### **3.03 FIELD QUALITY CONTROL**

- A. Manufacturer's representative to field verify system has been completed and operates properly.
- B. Direct adjustments of items where necessary to ensure satisfactory operation.
- C. Submit written certification at completion of inspection.

**END OF SECTION**

## RESIDENTIAL APPLIANCES

### PART 1 GENERAL

#### 1.01 SECTION INCLUDES

- A. Kitchen appliances.
- B. Laundry appliances.

#### 1.02 RELATED REQUIREMENTS

- A. Section 22 21 13 - Pipe and Pipe Fittings Plumbing: Plumbing connections.
- B. Section 26 05 00 - Common Work Results for Electrical: Electrical connections.

#### 1.03 REFERENCE STANDARDS

- A. UL (EAUED) - Electrical Appliance and Utilization Equipment Directory; Underwriters Laboratories Inc.; current edition.

#### 1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Manufacturer's data indicating dimensions, capacity, and operating features of each piece of residential equipment specified.
- C. Copies of Warranties: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

#### 1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years of documented experience.
- B. Electric Appliances: Listed and labeled by UL and complying with NEMA standards.

#### 1.06 WARRANTY

- A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.
- B. Provide five (5) year manufacturer warranty on refrigeration system of refrigerators.
- C. Provide ten (10) year manufacturer warranty on magnetron tube of microwave ovens.
- D. Provide ten (10) year manufacturer warranty on tub and door liner of dishwashers.

### PART 2 PRODUCTS

#### 2.01 KITCHEN APPLIANCES

- A. Refrigerator : Free-standing, top-mounted freezer, frost-free.
  1. Capacity: Total minimum storage of 18 cubic ft; minimum 15 percent freezer capacity.
  2. Energy Usage: Minimum 20 percent more energy efficient than energy efficiency standards set by DOE.
  3. Features: Include glass shelves and light in freezer compartment.
  4. Finish: Porcelain enameled steel, color white.
  5. Product:
    - a. Whirlpool Corp; Product WRT138FZDW: [www.whirlpool.com](http://www.whirlpool.com).
    - b. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Refrigerator (Lactation Room): Under-counter, ADA compliant.
  1. Capacity: Total minimum storage of 5.5 cubic ft.
  2. Size: 24 inches wide x 32 inches high.
  3. Connection: 120 volt.

4. Features: Include glass shelves.
  5. Finish: Porcelain enameled steel, color white.
  6. Product:
    - a. Model FF61BIADA Series by Summit Appliances: [www.summitappliance.com](http://www.summitappliance.com).
    - b. Substitutions: See Section 01 60 00 - Product Requirements.
- C. Range (ADA and Teacher's Station): Electric, drop-in, with standard burners and removable drip pans.
1. Size: 30 inches.
  2. Oven: Self-cleaning .
  3. Elements: 4.
  4. Controls: Solid state electronic; ADA compliant.
  5. Features: Include automatic meat thermometer, storage drawer, oven door window, broiler pan and grid, and oven light.
  6. Finish: Porcelain enameled steel, color white.
  7. Product:
    - a. Frigidaire Home Products; Product FFED3015LW: [www.frigidaire.com](http://www.frigidaire.com).
    - b. Substitutions: See Section 01 60 00 - Product Requirements.
- D. Range (Non-ADA Locations): Electric, slide-in, with standard burners and removable drip pans.
1. Size: 30 inches.
  2. Oven: Self-cleaning .
  3. Elements: 4.
  4. Controls: Push-to-turn knobs with electronic clock and timer.
  5. Features: Include automatic meat thermometer, storage drawer, oven door window, broiler pan and grid, and oven light.
  6. Finish: Porcelain enameled steel, color white.
  7. Product:
    - a. Frigidaire Home Products; Product FFES3005LW: [www.frigidaire.com](http://www.frigidaire.com).
    - b. Substitutions: See Section 01 60 00 - Product Requirements.
- E. Modular Cooktop : Electric, induction type.
1. Size: 15 x 24 inches.
  2. Elements: 2.
  3. Finish: Glass .
  4. Connection: 120 volt, 1,800 watts.
  5. Product:
    - a. Model S2F2 Cooktop by True Induction: [www.trueinduction.com](http://www.trueinduction.com)
    - b. Substitutions: See Section 01 60 00 - Product Requirements.
- F. Cooking Exhaust : Range hood.
1. Size: 30 inches.
  2. Fan: Three- speed, 300 cfm
  3. Exhaust: Round, vented to exterior.
  4. Features: Include cooktop light and removable grease filter.
  5. Finish: Painted steel, color white.
  6. Manufacturers:
    - a. Frigidaire Home Products; Product FHWC3040MS: [www.frigidaire.com](http://www.frigidaire.com).
    - b. Substitutions: See Section 01 60 00 - Product Requirements.
- G. Microwave : Countertop.
1. Capacity: 2.2 cubic ft.
  2. Power: 1200 watts.
  3. Features: Include turntable.
  4. Finish: White.
  5. Product:
    - a. Frigidaire Home Products; Product FFCE2238LW: [www.frigidaire.com](http://www.frigidaire.com).
    - b. Substitutions: See Section 01 60 00 - Product Requirements.
- H. Dishwasher (ADA): Undercounter.

1. Size: 24 inches wide x 32-1/4 inches high, 22 inch depth.
2. Controls: Solid state electronic; ADA compliant.
3. Wash Levels: 2.
4. Cycles: 6, including normal.
5. Connection: 120 volt, 15 amp; 1300 watt.
6. Features: Include rinse aid dispenser.
7. Finish: Porcelain enameled steel, color white.
8. Product:
  - a. Model D5424XLW by Asko Appliances: [www.askona.com](http://www.askona.com).
  - b. Substitutions: See Section 01 60 00 - Product Requirements.

## **2.02 LAUNDRY APPLIANCES**

- A. All Equipment Eligible for Energy Star Rating: Energy Star Rated.
- B. Clothes Washer (ADA): Front-loading; ADA compliant.
  1. Size: 2.12 cubic ft..
  2. Controls: Solid state electronic.
  3. Cycles: Include normal and soak.
  4. Motor Speed: Single-speed.
  5. Features: Include optional second rinse, bleach dispenser, fabric softener dispenser, sound insulation, and end of cycle signal.
  6. Finish: Painted steel, color white.
  7. Product:
    - a. Model W6324W Washing Machine by Asko Appliances: [www.askona.com](http://www.askona.com).
    - b. Substitutions: See Section 01 60 00 - Product Requirements.
- C. Clothes Dryer (ADA): Electric, stationary, ADA compliant.
  1. Size: Large capacity.
  2. Controls: Solid state electronic, with electronic moisture-sensing dry control.
  3. Temperature Selections: Four.
  4. Cycles: Include normal, permanent press, knit/delicate, and air only.
  5. Connection: 220 volt, 12 amp, 2800 watt.
  6. Features: Include interior light, reversible door, stationary rack, sound insulation, and end of cycle signal.
  7. Finish: Painted steel, color as indicated.
  8. Product:
    - a. Model T744CW Condenser by Asko Appliances: [www.askona.com](http://www.askona.com).
    - b. Substitutions: See Section 01 60 00 - Product Requirements.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify utility rough-ins are present and correctly located.

### **3.02 INSTALLATION**

- A. Install in accordance with manufacturer's instructions.
- B. Anchor built-in equipment in place.

### **3.03 ADJUSTING**

- A. Adjust operating equipment to efficient operation.

### **3.04 CLEANING**

- A. Remove packing materials from equipment.

B. Wash and clean equipment.

**END OF SECTION**

## FOOD SERVICE EQUIPMENT

### PART 1 GENERAL

#### 1.01 SECTION INCLUDES

- A. Foodservice equipment.

#### 1.02 RELATED SECTIONS

- A. Refer to General Conditions, Supplementary Conditions, and applicable provisions of Division 1 for additional instructions.
- B. Refer to Division 22 - Mechanical; for applicable provisions and sections regarding mechanical services, including, but not limited to, rough-ins, grease traps, steam traps, drain traps, atmospheric vents, valves, pipes and pipe fittings, ductwork, and other materials necessary to complete final connections to individual items as specified in this Section; not work of this Section.
- C. Refer to Division 26 – Electrical; including, but not limited to, rough-ins, wiring, disconnects and other materials necessary to complete final connections to individual items as specified in this Section; not work of this Section..
- D. Work included in other Sections - Provision of all wall, floor, and/or ceiling/roof openings, recesses, sleeves, and/or conduits; and equipment pads, as required for installation of items included in this section. Also sealing of these openings, recesses, sleeves, etc., after installation of the equipment items, as required. Not work of this Section.

#### 1.03 DEFINITIONS

- A. Furnish - Supply and deliver to Project Site, ready for unloading, unpacking, assembly, installation, and similar operations.
- B. Install (set in place) - Operations at Project Site including actual unloading, unpacking, assembly, erecting, placing, anchoring, applying, finishing, curing, protecting, cleaning, and similar operations; ready for final utility connections by other Sections as appropriate.
- C. Provide - Furnish and install complete, ready for intended use.

#### 1.04 LAWS, ORDINANCES AND STANDARDS

- A. STANDARDS: Except as otherwise indicated, comply with the following standards as applicable to the manufacture, fabrication, and installation of the work of this Section:
  - 1. Air Conditioning and Refrigeration Institute (A.R.I): Comply with the applicable regulations and references of the latest edition of standards for remote refrigeration system(s), components and installation.
  - 2. American National Standards Institute (A.N.S.I.): Comply with A.N.S.I. A40.4 and A40.6 for water connection air gaps and vacuum breakers.



3. American Society of Heating, Refrigeration and Air Conditioning Engineers (A.S.H.R.A.E.): Comply with the applicable regulations and references of the latest edition of standards for remote refrigeration system(s), components and installation
4. American Society for Testing and Materials (A.S.T.M.): Comply with A.S.T.M. C1036 for flat glass.
5. American Society for Testing and Materials (A.S.T.M.): Comply with A.S.T.M. C1048 for heat-treated flat glass - Kind HS, Kind FT coated and uncoated glass.
6. American Welding Society (A.W.S.): Comply with A.W.S. D1.1 structural welding code.
7. National Electric Code (N.E.C.): Comply with N.F.P.A. Volume 5 for electrical wiring and devices included with foodservice equipment, A.N.S.I. C2 and C73, and applicable N.E.M.A. and N.E.C.A. standards.
8. National Electrical Manufacturers Association (N.E.M.A.): Comply with N.E.M.A. LD3 for high-pressure decorative laminates.
9. National Fire Protection Association (N.F.P.A.): Comply with the applicable sections of the N.F.P.A. for exhaust hood, ventilators, duct and fan materials, hoods fire suppression systems, construction and installation; as well as, local codes and standards.
10. National Sanitation Foundation (N.S.F.): Comply with the latest Standards and Revisions established by N.S.F. Provide N.S.F. Seal of Approval on each applicable manufactured item, and on items of custom fabricated work. (UL Sanitation approval and seal may be accepted if acceptable to local code jurisdictions.)
11. Sheet Metal and Air Conditioning Contractor's National Association (S.M.A.C.N.A.): Comply with the latest edition of S.M.A.C.N.A. guidelines for seismic restraint of kitchen equipment, and the applicable local regulatory agencies requirements.
12. Underwriters Laboratories (U.L.): For electrical components and assemblies provide either U.L. labeled products or, where no labeling service is available, "recognized markings" to indicate listing in the UL "Recognized Component Index". (Canadian Standards Association or alternate testing lab's seals may be accepted if acceptable to local code jurisdictions.)
13. UL 300 Standard: Wet chemical fire suppression systems for exhaust hoods/ventilators shall comply with these requirements.
14. American with Disabilities Act (ADA): Comply with requirements, as applicable to this Project.
15. Refrigeration Service Engineers Society (R.S.E.S.): Comply with the applicable regulations and references of the latest edition of standards for remote refrigeration system(s), components and installation; and the 1995 requirements of the Montreal Protocol Agreement.

16. All refrigerants used for any purpose shall comply with the 1995 requirements of the Montreal Protocol Agreement, and subsequent revisions and amendments. No CFC refrigerants shall be allowed on this Project.
17. All refrigeration components installation, repairs, and/or associated work on any refrigeration system, self-contained or remote, shall be performed by a Certified Refrigeration Mechanic.
18. Comply with all applicable local codes, standards and regulations and any special local conditions (example only: City of Los Angeles Testing Lab requirements).
19. Backflow prevention assemblies must be applied per WAC 246-290-490.
20. Backflow prevention equipment will be applied as required in UPC 603.4.13 and devices will be required to be from the current list of approved devices for use in Oregon State.
21. The UPC states that integral air gaps or vented backflow assembly be installed. An integral air gap is preferred. However if a backflow assembly is installed it must be a reduced pressure backflow assembly per AWWA Cross Connection Control Manual as cited under WAC 246-290-490 and installed so that it can be tested annually. If this is an integral assembly, Equipment supplier must provide information as to how it can be tested annually.
22. American Gas Association (A.G.A.): Comply with A.G.A. standards for gas heated equipment, and provide equipment with the A.G.A. seal. Automatic safety pilots to be provided on all equipment, where available. (Canadian Gas Association or alternate testing lab's seals may be accepted if acceptable to local code jurisdictions.)
23. American National Standards Institute (A.N.S.I.): Comply with A.N.S.I. Z21-Series standards for gas-burning equipment, and provide labels indicating name of testing agency.

**1.05 CONTRACTOR'S QUALIFICATIONS**

- A. In addition to requirements of Related Sections 1.02.A submit evidence of compliance with the following qualifications and conditions.
  1. Five (5) years minimum continuous operation under the same company name and ownership.
  2. Evidence of Company financial stability, and financial ability to complete this Project without endangering that stability.
  3. List of comparable size and scope projects completed in the last five (5) years, with Owner's contact name and telephone number.
  4. Have manufacturer's authorization to purchase, distribute, and install all items specified with this Project.
  5. Maintain a staff or have access to personnel with a minimum of five (5) years experience in the installation of comparable size and scope projects.

6. Maintain or have access to a fabrication shop meeting NSF standards and labeling requirements. (UL Sanitation approval and seal may be accepted if acceptable to local code jurisdictions.) If other than the Contractor's own fabrication shop, they shall have five (5) years minimum experience in the fabrication of comparable size, scope, and level of quality projects; and the Contractor shall submit their company name and credentials to the Architect, which shall have the right of approval or disapproval.
  7. Maintain a staff or have access to personnel experienced in the preparation of professional style shop drawings and submittals.
  8. Maintain or have access to manufacturer's authorized service personnel together with readily available stock of repair and replacement parts.
- B. Any sub-contractor employed by this Contractor, for this Project, shall comply the same qualification requirements.

**1.06 SUBSTITUTIONS**

- A. Submit bids for the specific manufacturer and model, size, capacity and accessories, as specified or shown on the drawings.
- B. Requests for substitutions must be submitted and approved in writing by the Architect. All substitutions and request for substitutions shall comply with conditions and requirements as stated in Section 012513.
- C. If custom fabricated items are submitted and accepted as a substitute to standard manufactured items, these items shall meet the specifications of the specified manufactured items, and in general, the fabrication sections which follows.

**1.07 DISCREPANCIES**

- A. Where discrepancies are discovered between the drawings and the specifications, regarding quality or quantity, the higher quality or the greater quantity shall be included in the Bid Proposal. Notify the Architect, in writing, of any discrepancies discovered; and await clarification prior to proceeding with the items or areas in question.

**1.08 SUBMITTALS**

- A. Rough-In Drawings:
  1. Submit one (1) digital set for approval. After approval, reproduce and supply the required number of corrected distribution prints for record and construction purposes.
  2. Submit 1/4 inch scale rough-in drawings for approval. These drawings shall be dimensioned; showing location of ducts, stubs, floor and wall sleeves, for ventilation, plumbing, steam, electrical, refrigeration lines, and concrete base and curb dimensions as required for equipment so supported. Provide plumbing and electrical rough-in drawings on separate sheets.
  3. Site-verify mechanical, electrical and ventilating rough-in and sleeve locations.

4. Maintain one record set with any related corrections, revisions, additions, deletions, changes, etc. noted during construction and installation; and provide an "as-built" set in reproducible transparency form at the completion of this phase of the Project.
5. The Contractor shall be responsible for the accuracy of the information on their submittals.
6. In the event rough-ins have been accomplished before award of this contract, the Contractor shall check the existing facility and make adjustments to their equipment to suit building conditions and utilities, where possible. If not possible, so state in a letter with reasons, and an alternate method and pricing, to the Owner, Architect and JLR Design Group.

B. Shop Drawings:

1. Submit one (1) digital set for approval. After approval, reproduce and supply the required number of corrected distribution prints for record and construction purposes.
2. Submit shop drawings for items of custom fabrication included in this contract. Shop drawings shall be submitted at 3/4 inch and/or 1-1/2 inch scale and shall show dimensions, materials, details of construction, installation and relation of adjoining work requiring cutting or close fitting. Shop drawings shall also indicate reinforcements, anchorage and related work required for the complete installation of fixtures.
3. Before proceeding with the fabrication of any item, the Contractor shall be responsible for verifying and coordinating all dimensions and details, with site dimensions and conditions.

C. Product Data Manuals:

1. Submit one (1) digital sets of manufacturer's specifications sheets with complete and specific information; including model numbers, options and accessories provided, exact utility requirements, and similar information on all items of standard manufacture. Distribute one additional copy of installation and start-up instructions to the Installer. Mark each data sheet with the applicable project equipment item number. Each data sheet to include N.E.M.A. plug and receptacle configuration for applicable items, where applicable.

- D. Architect's/Consultant's review of drawings, shop details, product data brochures, and service and parts manuals is for general conformance with the design concept and contract documents. Markings or comments shall not be construed as relieving the Contractor from compliance with the contract documents, or departures therefrom. The Contractor remains responsible for details and accuracy, for confirming and correlating all quantities and dimensions, for selecting fabrication processes, for techniques of assembly, and for performing their work in a safe, satisfactory, and professional manner.

**1.09 OPERATION AND MAINTENANCE DATA MANUALS**

- A. Service And Parts Manuals: Three (3) bound sets of service and parts manuals shall be furnished for items of standard manufacture before final acceptance of installation by Owner. Manuals to be in alphabetical order, according to manufacturer.
- B. Service Agency List: Submit, with the service and parts manuals, a complete list of local service agencies for included manufacturers, complete with telephone numbers.
- C. Provide video tapes for maintenance, training, operation, etc where available from the manufacturer.

**1.10 SCHEDULE**

- A. General: Time is of the essence in this agreement and acceptance constitutes a guarantee that the Contractor can and will obtain materials, equipment and manpower, upon notice to proceed, to permit overall completion of the entire building project on schedule. The Contractor shall coordinate their work with the progress schedule, as prepared and updated periodically by the General Contractor or Construction Manager.
- B. Unanticipated delays, not within the realm of control of the Contractor, shall be noted in a written notification to the Foodservice Consultant and the Architect, immediately upon the Contractor's realization that delays are imminent.
- C. Failure of manufacturers to meet promised delivery dates will not grant relief to the Contractor for failure to meet schedules; unless the Contractor can establish, in writing, that orders were received by the manufacturer, with reasonable lead times.
- D. Extra charges resulting from special handling or air shipment in order to meet the schedule will be paid by the Contractor if insufficient time was allowed in placing factory orders.

**1.11 PRODUCT HANDLING**

- A. Delivery Of Materials: Deliver materials (except bulk materials) in manufacturer's containers fully identified with manufacturer's name, trade name, type, class, grade, size, color and item number.
- B. Storage Of Materials, Equipment And Fixtures: Contractor is responsible for receiving and warehousing of equipment and fixtures, until ready for installation. Store materials, equipment and fixtures in sealed containers. Store off the ground and under cover, protected from damage.
- C. Handling Materials And Equipment: Verify and coordinate conditions at the building site, particularly door and/or wall openings, and passages, to assure access for all equipment. Pieces too bulky for existing facilities shall be hoisted or otherwise handled with apparatus as required. All special handling equipment charges shall be arranged for and paid for by the Contractor.

**1.12 PRODUCT PROTECTION**

- A. The Contractor is responsible, during the progress of the project, to protect their equipment against theft or damage, until final acceptance by the Owner. Items delivered

to the job site at the Owner's or Contract Manager's request before the site is ready for installation; should be signed for, as delivered by the Owner or Contract Manager.

- B. Use all means reasonable to protect the materials of this Section before, during, and after installation; and to protect the associated work and materials of the other trades.
- C. Pre-fabricated walk-in boxes, on-site and installed in advance of the rest of the equipment, are not to be available for or used as general storage by other trades; and should be locked before leaving the site. Damage and theft resulting from the failure to secure boxes shall be repaired or replaced at Contractor's own expense.

**1.13 WARRANTY**

- A. Unless otherwise noted in Related Sections 1.02.A, items furnished shall be fully guaranteed against defects in workmanship and material(s) for one full year after issue of Certificate Of Occupancy, or the equivalent. Should a Temporary Certificate Of Occupancy be issued for partial completion of work, the items furnished within that designated area shall be under warranty from the date of issue of that Certificate. Repairs and replacements will be made by the Contractor or their service agent without charge to the Owner, and within a reasonable time.

**PART 2 - PRODUCTS**

**2.01 EQUIPMENT**

- A. Equipment schedule: Refer to schedule on Foodservice Drawings and Itemized Specifications for equipment included in this Section.

**2.02 MATERIALS**

- A. Metals:
  - 1. Stainless Steel: AISI Type 302/304, hardest workable temper, No.4 directional polish.
  - 2. Galvanized Steel Sheet: ASTM A526, except ASTM A527 for extensive forming; ASTM A525, G90 zinc coating, chemical treatment.
    - a. Where painted finish is indicated, provide mill phosphatized treatment in lieu of chemical treatment.
  - 3. Steel Sheet: ASTM A569 hot-rolled carbon steel.
  - 4. Galvanized Steel Pipe: ASTM A53 or ASTM A120, welded or seamless, schedule 40, galvanized.
  - 5. Steel Structural Members: Hot rolled or cold formed, carbon steel unless stainless steel is indicated.
    - a. Galvanized Finish (G.I.): ASTM A123 hot-dipped zinc coating, applied after fabrication.

6. Aluminum: ASTM B209/B221 sheet, plate and extrusions (as indicated); alloy, temper and finish as determined by manufacturer/fabricator, except 0.40-mil natural anodized finish on exposed work unless another finish is indicated.
- B. Plastic Laminate: NEMA LD3, Type 2, 0.050" thick, except Type 3, 0.042" for post-forming smooth (non-textured). Color and texture as selected by the Architect/ Interior Designer.
1. Comply with N.S.F. No. 35.
  2. Veneered with approved waterproof and heatproof cement. Rubber base adhesives are not acceptable.
  3. Applied directly over close grained plywood, such as solid Mahogany or solid Birch, of selected, smooth, sanded stock to ensure a smooth ripple-free laminated surface; or commercial grade furniture particle board, Cortron or equal.
  4. If specified plywood or particle board is unavailable, submit specifications and sample of alternate material for approval.
  5. Exposed faces and edges shall be faced with 1/16 inch (1.6mm) thick material. Corresponding backs are to be covered with approved backing and balancing sheet material. No unfinished exposed plywood/particle board will be acceptable.
- C. Insulation:
1. For low temperature applications, such as ice bins, cold pans, or fabricated under counter freezers, use urethane, rigid board foam or foamed-in-place; not less than 2 inches (50mm) thick, except that vertical surfaces of cold pans and ice bins may be 1 inch (25mm) thick. Insulation shall be bonded at joints, to prevent condensation on exterior.
  2. At counter tops, subject to heat from cooking equipment and refrigeration compressors, use 1 inch (25mm) thick B&Z Products (1-800-999-0890) Marinite I, or equal, to insulate underside of top.
  3. Marinite material shall be added between freezer or refrigerator, and 14 gauge (2.0) stainless steel top.
  4. All insulation shall be fully encased or enclosed.
- D. Joint Materials:
1. Sealants: 1-part or 2-part, polyurethane or silicone based, liquid elastomeric sealant, non-solvent release type, Shore A hardness of 30, except 45 if subject to traffic.
  2. Backer Rod: For 3/8 inch or larger joints, shall be polyurethane rod stock, larger than joint width.

3. Gaskets: Solid or hollow (but not cellular) neoprene or polyvinyl chloride; light grey, minimum of 40 Shore A hardness, self-adhesive or prepared for either adhesive application or mechanical anchorage.
- E. Paint And Coatings:
1. Provide the types of painting and coating materials which, after drying or curing, are suitable for use in conjunction with foodservice, and which are durable, non-toxic, non-dusting, non-flaking, mildew resistant, and comply with governing regulations for foodservice.
  2. Galvanize Repair Paint: MIL-P-21035.
  3. Bituminous Paint: Sound deaden internal surfaces of metal work, and underside of metal counters and tables between work top and underbracing.
  4. Pretreatment: SSPC-PT2 or PT3, of FS TT-C490.
  5. Primer Coating for Metal: FS TT-P-86, type suitable for baking, where indicated.
  6. Enamel for Metal: Synthetic type, FA TT-P-491, type suitable for baking, where indicated.

## 2.03 FABRICATED PRODUCTS

- A. Hardware:
1. General: Manufacturer's standard, but not less than ANSI 156.9 Type 2 (Institutional), satin finish stainless steel or dull chrome finish on brass, bronze, or steel.
  2. Hinged Door Hardware: Hinged doors shall be mounted with heavy duty N.S.F. approved hinges with Component Hardware Group, Model No. P62-1010 pulls, or equal. Catches shall be heavy-duty magnetic type, except as otherwise indicated..
  3. Drawer Hardware: Slides to be 200 pounds minimum capacity per pair, 300 series stainless steel, full extension, side-mounting, self-closing type, with stainless steel ball-bearings and positive stops; Component Hardware Group Series S52, or equal. Pulls shall be Component Hardware Group, Model No. P62-1012, or equal.
  4. Sliding Door Hardware: Sliding doors shall be mounted on large, quiet ball bearing rollers in 14-gauge (2.0mm) stainless steel overhead tracks, and be removable without the use of tools. Bottom of cabinet shall have stainless steel guide-pins and not channel tracks for doors.
  5. All hardware shall be identified with manufacturer's name and number, so that broken or worn parts may be replaced.



B. Casters:

1. Type and size as recommended by caster manufacturer, N.S.F. approved for the type and weight of equipment supported; but not less than 5 inch (127mm) diameter heavy-duty, ball-bearing, solid or disc wheel with non-marking grease proof rubber, neoprene or polyurethane tire; unless otherwise specified. Minimum width of tread shall be 1-3/16 inch (30mm). Minimum capacity per caster shall be 250 pound (113.4kg), unless otherwise noted in itemized specifications.
2. Solid material wheels to be provided with stainless steel rotating wheel guard.
3. To be sanitary, have sealed wheel and swivel bearings and polished plated finish per N.S.F.
4. Unless otherwise indicated, equip each item with two (2) swivel-type casters and two (2) fixed casters. Provide foot brakes on two (2) casters on opposite corners of equipment.
5. Unless equipment item is equipped with another form of all-around protective bumper, provide circular rotating bumper above each caster, 5 inch (127mm) diameter tire of light grey synthetic rubber (hollow or closed-cell) on cadmium-plated disc.

C. Plumbing Fittings, Trim And Accessories:

1. General: Where exposed or semi-exposed, provide bright chrome plated brass or polished stainless steel units. Provide copper or brass where not exposed.
2. Vacuum Breakers: Provide with foodservice equipment as listed in the itemized specifications.
3. Water Outlets: At sinks and at other locations where water is supplied (by manual, automatic or remote control), furnish commercial quality faucets, valves, dispensers or fill devices, of the type and size indicated, and as required to operate equipment and fixtures as indicated.
4. Waste Fittings: Except as otherwise indicated, furnish 2 inch (50mm) remote-lever waste valve, and 3-1/2 inch (89mm) strainer basket.

D. Electrical Materials:

1. General: Provide standard materials, devices and components as recommended by the manufacturer or fabricator, selected and installed in accordance with N.E.M.A. standards and recommendations; and as required for safe and efficient use and operation of the foodservice equipment, without objectionable noise, vibration and sanitation problems.
2. Before ordering equipment, confirm with the serving electrical utility, pertinent electrical requirements, such as actual voltages available, number of phases and number of wires in the system.

3. Electrical work for fabricated equipment shall be completely wired to a junction or pull box, wholly accessible, mounted on the equipment. Wiring shall be labeled for outlet or item served. Verify local requirements for U.L. Listing on complete assembly, and provide if required.
4. Components shall bear the U.L. label or be approved by the prevailing authority.
5. Custom fabricated refrigerator units shall be provided with vapor tight light receptacles, shatterproof lamps and automatic switches. Wiring shall be concealed.
6. Controls and Signals: Provide recognized commercial grade signals, on-off push buttons or switches, and other speed and temperature controls as required for operation; complete with pilot lights and permanent signs and graphics to assist the user of each item. Provide stainless steel cover plates at control and signal electrical boxes. Controls and switches are to be located out of heat zones, easily accessible, and in locations that preclude accidental contact by employees.
7. Internal Wiring of Fixtures and Equipment:
  - a. The Contractor shall be responsible for internal wiring of electrical devices, built into or forming an integral part of fabricated equipment items. Wiring to be in metal conduit, to an accessible pull-box, tagged for intended use. Refer to Section 16 Specifications for color coding of wiring.
  - b. Each standard item shipped in sections, shall be properly connected internally, and verified by the Contractor.
  - c. Furnish dish washers and conveyors internally wired to junction box or distribution panel as specified; including push button switches, motors, immersion heaters, solenoids, etc.
  - d. Where light fixtures are specified or detailed as part of counters, cases or fixtures; light fixtures, lamps and shields shall be furnished and installed. Warm white lamps shall be provided, unless otherwise specified. If fluorescent light fixtures are specified, ballasts shall be provided and shields shall be included. Shields shall be provided for all light fixtures.
  - e. Exposed flexible steel conduit on kitchen equipment, shall be neoprene jacketed Seal-Tite conduit equal to Anaconda type "UA". U.L. approved, complete with approved liquid-tight connectors on each end; designed to provide electrical grounding continuity.
  - f. Exposed electrical conduit used in kitchen wet area applications, except for flexible connections, shall be rigid galvanized steel. Thinwall conduit (EMT) shall not be permitted for wet areas. Exposed outlet boxes shall be liquid-tight type, with threaded hubs.
8. Convenience and Power Outlets:

- a. Make cutouts and install appropriate boxes or outlets in fabricated fixtures, complete with wiring, conduit, outlet and stainless steel cover plate.
  - b. Outlets and plugs shall conform to N.E.M.A. standards.
  - c. Electrical outlets and devices shall be first quality "Specification Grade".
  - d. GFCI outlets shall be furnished in all kitchen areas.
9. Plugs and Cords: Where cords and plugs are provided, they shall comply with National Electrical Manufacturer's Association (N.E.M.A.) requirements. Indicate N.E.M.A. configuration for each applicable item.
10. Heating Equipment:
- a. Electric and heating equipment shall be so installed as to be readily cleanable or removable for cleaning.
11. Motors: Totally enclosed type, except drip-proof type where not exposed to a dust or moisture condition; ball bearings, except sleeve bearings on small timing motors; windings impregnated to resist moisture; horse-power and duty-cycle ratings as required for the service indicated.
12. Power Characteristics: Refer to Section 16 Specifications for project power characteristics. Also, refer to individual equipment requirements, for loads and ratings.

**2.04 FABRICATION OF METALWORK**

- A. General Fabrication Requirements:
- 1. Remove burrs from sheared edges of metalwork, ease the corners and smooth to eliminate cutting hazard. Bend sheets of metal, at not less than the minimum radius required to avoid grain separation in the metal. Maintain flat, smooth surfaces, without damage to finish.
  - 2. Reinforce metal at locations of hardware, anchorages and accessory attachments; wherever metal is less than 14 gauge (2.0mm), or requires mortized application. Conceal reinforcements to the greatest extent possible. Weld in place, on concealed faces.
  - 3. Exposed screws or bolt heads, rivets and butt joints made by riveting straps under seams and then filled with solder, will not be accepted. Where fasteners are permitted, provide Phillips head, flat or oval head machine screws. Cap threads with acorn nuts, unless fully concealed in inaccessible construction; and provide nuts and lockwashers unless metal for tapping is at least 12 gauge (2.5mm). Match fastener head finish with finish of metal fastened.
  - 4. Where components of fabricated metal work are indicated to be galvanized, and involve welding or machining of metal heavier than 16 gauge (1.6mm), complete the fabrication and provide hot-dip galvanizing of each component, after

fabrication, to the greatest extent possible (depending upon available dip-tank sizes). Comply with ASTM A123.

5. Welding And Soldering:
  - a. Materials 18-gauge (1.27mm), or heavier, shall be welded.
  - b. Seams and joints shall be shop welded or soldered as the nature of the material may require.
  - c. Welds must be ground smooth and polished to match original finish.
  - d. Where galvanizing has been burned off, the weld shall be cleaned and touched up with high grade aluminum paint.
6. Provide removable panels for access to mechanical and electrical service connections, which are concealed behind or within foodservice equipment, but only where access is not possible and not indicated through other work.
7. Closures: Where ends of fixtures, splashbacks, shelves, etc., are open, fill by forming the metal, or welding sections, if necessary, to close entire opening flush to walls or adjoining fixtures.
8. Rolled Edges: Rolled edges shall be as detailed, with corners bullnosed, ground and polished.
9. Coved Corners: Stainless steel foodservice equipment shall have 1/2 inch (13mm) or larger radius coves in horizontal and vertical corners, and intersections, per N.S.F. standards.

B. Metal and Gauges:

1. Except as otherwise indicated, fabricate exposed metalwork of stainless steel; and fabricate the following components from the gauge of metal indicated, and other components from not less than 20 gauge (0.8mm) metal:
  - a. Table and counter tops: 14 gauge.
  - b. Sinks and drainboards: 14 gauge.
  - c. Shelves: 16 gauge.
  - d. Front drawer and door panels: 18 gauge (double-pan type).
  - e. Single pan doors and drawer fronts: 16 gauge.
  - f. Enclosed base cabinets: 18 gauge.
  - g. Enclosed wall cabinets: 18 gauge.
  - i. Pan-type insets and trays: 16 gauge.

j.Removable covers and panels:	18 gauge.
k.Skirts and enclosure panels:	18 gauge.
l.Closure and trim strips over 4" wide:	18 gauge.
m.Hardware reinforcement:	12 gauge.
n.Gusset plates:	10 gauge.

C. Work-Surface Fabrication:

1. Fabricate metal work surfaces by forming and welding, to provide seamless construction; using welding rods matching sheet metal, grinding and polishing. Where necessary for disassembly, provide waterproof gasketed draw-type joints with concealed bolting.
2. Reinforce work surfaces 30 inches on center both ways, with galvanized or stainless steel concealed structural members. Reinforce edges which are not self-reinforced, by formed edges.

D. Metal Top Construction:

1. Metal tops shall be one-piece welded construction, including field joints. Secure to a full perimeter galvanized steel channel frame cross-braced not farther than 2'-6" (760mm) on center. Fasten top with stud bolts or tack welds. If hat sections are used in lieu of channels, close ends.
2. Properly designed draw fastening, trim strip, or commercial joint material to suit requirement shall be used, only if specified.

E. Structural Framing:

1. Except as otherwise indicated, provide framing of minimum 1 inch (25mm) pipe-size round pipe or tube members, with mitered and welded joints and gusset plates, ground smooth. Provide 14 gauge (2.0mm) stainless steel tube for exposed framing, and galvanized steel pipe for concealed framing.
2. Where indicated, flange rear and end edges up to form splashes integrally with top, with vertical and horizontal corners covered of not less than 1/4 inch (6mm) radius, die formed. Turn back splashes 1 inch to wall across top and ends with rounded edge on break, unless otherwise specified.
3. For die-crimped edges, use inverted "V" 1/2 inch (13mm) deep inside and 2 inch (38mm) deep on outside, unless otherwise shown. For straight down flanges, make 1-3/4 inch (45mm) deep on outside. For bullnose edges, roll down 1-3/4 inch (45mm).
4. Edges: die-formed, integral with top. For rounded corners, form to 1 inch radius, weld, and polish to original finish.

- F. Field Joints: For any field joint required because of size of fixture; butt-joint, reinforce on underside with angles of same material, bolt together with non-corrosive bolts and nuts, field weld, grind and polish.
  
- G. Pipe Bases: Construct pipe bases of 1-5/8 inch (41mm) diameter 18 gauge (1.2mm) stainless steel tubing. Fit legs with polished stainless steel sanitary adjustable bullet feet to provide for adjustment of approximately 1-1/2 inch (38mm), without exposing threads. Space legs to provide ample support for tops, precluding any possibility of buckling or sagging, and in no case more than 6'-0" centers.
  
- H. Legs and Crossrails
  - 1. Equipment legs and crossrails shall be 1-5/8 inch (41mm), 16-gauge (1.59mm) stainless steel tubing.
  - 2. Welds at cross rails shall be continuous and ground smooth. Please note; tack welds are not acceptable.
  - 3. Bottom of legs shall be swedged inward and fitted with a stainless steel bullet-type foot with not less than 2 inch (50mm) adjustment.
  - 4. Free standing legs shall be pegged to floor with 1/4 inch (6mm) stainless steel rod.
  - 5. Components:
    - a. Stainless Steel Gusset: Stainless steel exterior to fit 1-5/8 inch (41mm) tubing, with allen screw for fastening and adjustment. Not less than 3 inches (76mm) diameter at top and 3-3/4 inch (95mm) long. Outer shell 16-gauge (1.6mm) stainless steel, reinforced with 12-gauge (2.5mm) mild steel insert welded interior shell, or approved equal.
    - b. Stainless Steel Low Counter Legs: Stainless steel exterior 5-3/4 inch (146mm) minimum, 7 inch (178mm) maximum length with stainless steel 3-1/2 inch (89mm) square plate with four counter-sunk holes, welded to top for fastening.
    - c. Stainless Steel Adjustable Foot: Stainless steel 1-1/2 inch (38mm) diameter tapered at bottom to 1 inch (25mm) diameter, fitted with threaded cold rolled rod for minimum 1-1/2 inch (38mm) diameter x 3/4 inch (19mm) threaded bushing plug welded to legs, or approved equal. Push-in foot not acceptable.
  - 6. Legs shall be fastened to equipment with gussets, as follows:
    - a. Sinks: Reinforced with bushings and set screw.
    - b. Metal Top Tables and Dish Tables: Welded to galvanized steel channels, 14-gauge (1.98mm) or heavier, anchored to top with screws through slotted holes.

I. Shelves:

1. Construct solid shelves under pipe base tables of 16 gauge stainless steel, with 1-1/2 inch turned down and under edges on exposed sides, and 2 inch turn up against walls or equipment. Fully weld to pipe legs.
2. In fixtures with enclosed bases, turn up shelves on back and sides with 1/4 inch (6mm) (minimum) radius and feather slightly to ensure a tight fit to enclosure panels.

J. Sinks:

1. Construct sinks of 14 gauge stainless steel with No.4 finish inside and outside.
2. Form back, bottom and front of one piece, with ends and partitions welded into place. Partitions: double thickness, 1 inch minimum space between walls. Multiple compartments shall be continuous on the exterior, without applied facing strips or panels.
3. Cove interior vertical and horizontal corners of each tub not less than 1/4 inch radius, die formed. Outer ends of drainboards to have roll rim risers not less than 3 inches high.
4. Drill faucet holes in splashes 2-1/2 inches below top edge. Verify center spacing with faucet specified.
5. Sink insets shall be deep drawn of 16-gauge (1.59mm), or heavier, polished stainless steel. Weld into sink drainboards with 1-1/2 inch x 1-1/2 inch x 14 gauge stainless steel angle brackets; securely welded to sinks and galvanized cross angles spot welded to underside of drainboards to form an integral part of the installation.
6. The bottom of each compartment shall be creased such as to ensure complete drainage to waste opening. Slope bottom of sink bowls toward outlet.

K. Drains, Wastes and Faucets:

1. Furnish and install Fisher model 22322 stainless steel rotary drain assembly with connected overflow assembly, in die-drawn inset type sinks and bain marie sinks.
2. Other custom fabricated sinks shall be furnished with Fisher model 22322 stainless steel rotary drain assembly, with S/S cap nut over overflow outlet. Waste connection shall have 2 inch (50mm) external thread size, with 1-1/2 inch (38mm) internal thread size.
3. Rotary Handle: Of sufficient length to extend to front edge of sink. No riveting, screws or soldering permitted to fit drains to sinks, with all parts of drains easily removable for servicing and replacement.
4. Water pans for steam tables shall be fitted with 1 inch (25mm) drains with chrome-plated brass stand pipes.

5. All faucets furnished with equipment included in this Section shall be lead free and comply with NSF Standard #61, Section #9; such as manufactured by Fisher, or T&S. Where the itemized specifications list a faucet by manufacturer and model, the Contractor shall verify that the listed faucet complies with this requirement. If the listed faucet does not comply, the Contractor shall submit a similar model which does comply, from the same manufacturer where available; or from one of the above manufacturers.

L. Workmanship:

1. Best quality in the trade. Field verify dimensions before fabricating; conform all items to dimensions of building; neatly fit around pipes, offsets and other obstructions.
2. Fabricate only in accordance with approved shop drawings, showing pipes, obstructions to be built around, and location of utilities and services.

M. Enclosures:

1. Provide enclosures, including panels, housings, and skirts for service lines, operating components and mechanical and electrical devices associated with the foodservice equipment, except as specifically indicated to be "open".
2. Where equipment is exposed to customer view, provide enclosure of service lines, operating components and mechanical and electrical devices.

N. Casework:

1. Enclosure: except as otherwise 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.
2. Bases shall be made of 18-gauge (1.27mm) stainless steel sheets reinforced by forming the metal.
3. Ends, partitions and shelves are stainless steel.
4. Unexposed backs and structural members are galvanized.
5. Vertical ends and partitions are single wall, with a 2 inch (50mm) face.
6. Sides and through partitions are flush with bottom rail, welded at intersections.
7. Shelves: Provide adjustable standards for positioning and support of shelves in casework; except bottom shelf of cabinet mounted on legs or as specified. Turn back of shelf units up 2 inches, and hem. Turn other edges down to form open channel. Reinforce shelf units to support 40 pounds per square foot loading, plus 100 percent impact loading.
8. Bottom front rail of bases set on masonry platform shall be continuously closed and sealed to platform.



O. Doors:

1. Metal doors shall be double-cased stainless steel. Outer pans shall be 18-gauge (1.27mm) stainless steel with corners welded, ground smooth and polished. Inner pan shall be 20-gauge (.95mm) stainless steel fitted tightly into outer pan with a sound-deadening material such as Celotex or styrofoam used as a core. The two pans shall be tack welded together and joints solder filled. Doors shall finish approximately 3/4 inch (19mm) thick, and be fitted with flush recessed type stainless steel door pulls.
2. Wood doors shall be fabricated as detailed. If formica or other plastic surfaces are used, sides and backs must be laminated.
3. Hinged doors shall be mounted on heavy-duty N.S.F. approved hinges, or as noted on plans or specifications.

P. Drawer Assemblies:

1. Assemblies shall consist of removable drawer body mounted in a ball bearing slide assembly with fully enclosed housing.
2. Slide assembly consists of one pair of 200 pound stainless steel roller bearing extension slides, with side and back enclosure panels, front spacer angle, two drawer carrier angles, secured to slides and stainless steel front.
3. Drawer bodies for general storage are to be 20 inches x 20 inches (508mm x 508mm), with 18 gauge stainless steel or Royalite containers.
4. Drawers intended to hold food products shall be removable type with 12 x 20 (305mm x 508mm) stainless steel food pans, in a stainless steel assembly.
5. Drawer fronts are double cased, 3/4 inch (19mm) thick, with 18 gauge (1.27mm) stainless steel welded and polished front pan. Steel back pan is tightly fitted and tack welded. Sound deaden with rigid insulation material.
6. Provide drawers with replaceable soft neoprene bumpers; or for refrigerated drawers, a full perimeter soft gasket.

Q. Closed Base: Where casework is indicated to be located on a raised-floor base, prepare casework for support without legs, and for anchorage and sealant application, as required for a completely enclosed and concealed base.

R. Support from Floor: Equip floor supported mobile units with casters, and equip items indicated as roll-out units, with manufacturer's standard one-directional rollers. Otherwise, and except for closed-base units, provide pipe or tube legs, with adjustable bullet-design feet for floor supported items of fabricated metalwork. Provide 1-1/2 inch adjustment of feet (concealed threading).

S. Shop Painting:

1. Clean and prepare metal surfaces to be painted; remove rust and dirt. Apply treatment to zinc coated surfaces, which have not been mill phosphatized. Coat welded and abraded areas of zinc coated surfaces, with galvanize repair paint.

2. Apply 1.5 mil (dry film thickness) metal primer coating, followed by 2, 1.0 mil (dry film thickness) metal enamel finish coatings.
  3. Bake primer and finish coatings in accordance with paint manufacturer's instructions for a baked enamel finish.
- T. Sound Deadening:
1. Sound deaden underside of metal tops, drainboards, undershelves, cabinet interior shelves, etc., above the underbracing/reinforcing/framing only.

**2.05 REFRIGERATION EQUIPMENT**

- A. General:
1. Furnish either single or multiple compressor units, as specified or recommended by the manufacturer for the sizes and variations between connected evaporator loads as indicated.
  2. Furnish units of the capacities indicated, arranged to respond to multiple-evaporator thermostats and defrosting timers. Include coils, receivers, compressors, motors, motor starters, mounting bases, vibration isolation units, fans, dryers, valves, piping, insulation, gauges, winter control equipment and complete automatic control system.
  3. Refrigerant: Precharge units with type or types recommended by manufacturer for services indicated, with quick-disconnects type connections where specified, ready to receive refrigerant piping runs to evaporators and (where remote) to condensers. All refrigerant and associated components shall comply with the 1995 requirements of the Montreal Protocol Agreement. No CFC refrigerants or associated components shall be allowed on this Project. HFC refrigerants and components shall be used where available. HCFC refrigerants and components, with a minimum 2010 phase-out date, and intermediate replacement refrigerants are to be used only when HFC refrigerants are not available. Contractor shall be responsible for coordinating with manufacturers.
  4. The minimum outdoor operating ambient temperature for design of units is -10 degrees Fahrenheit, or as applicable for extreme low local conditions. The maximum indoor design temperature for operation of compressor units is 95 degrees Fahrenheit. The maximum outdoor ambient design temperature shall be determined with prevailing conditions at mounting location(s) of compressor(s), such as sun exposure, limited ventilation, high fences/walls, roof color and materials, local climatic extremes, etc.; but in no case shall it be less than 100 degrees Fahrenheit.
- B. Components:
1. Coils: Coils for fabricated refrigerators shall have vinyl plastic coatings, stainless steel housings; and shall be installed in such a manner as to be replaceable.
  2. Expansion Valves: Remote refrigeration system shall be complete with thermostatic expansion valves at the evaporator.

3. Thermometers:
  - a. Fabricated refrigerated compartments to be fitted with flush dial thermometers, with chrome plated bezels.
  - b. Thermometers shall be adjustable, and shall be calibrated after installation.
  - c. Thermometers shall have an accuracy of  $\pm 2$  degrees Fahrenheit (1 degree Centigrade).
4. Hardware:
  - a. Refrigerator hardware for fabricated refrigerator compartments shall be heavy-duty components.
  - b. Self closing hinges.
  - c. Latches to be magnetic edge mount type, unless specified or detailed otherwise.
5. Locks: Doors and drawers for walk-in coolers/freezers, and reach-in refrigerated compartments, both fabricated and standard, shall be fitted with cylinder locking type latches, and provided with master keys.
- C. Cold Pans: Ice pans, refrigerated pans and cabinets shall be provided with breaker strips, where adjoining top or cabinet face materials, to prevent transfer of cold.
- D. All open top mechanically cooled custom fabricated or standard buy-out refrigerators and/or cold pans shall comply with NSF Standard #7 requirements, as of April 1, 1998. The Contractor shall verify that the specified unit complies with this requirement; or shall submit a similar model, which does comply, from the same manufacturer where available.
- E. Ventilation Of Refrigerated Equipment:
  1. Adequate ventilation shall be provided for custom fabricated equipment with integral refrigeration condensing units, both built-in and drop-in. If flow through ventilation cannot be provided, provide flow direction partitions and an additional fan capable of cooling the condensing unit.
  2. If, in the opinion of the Contractor, additional room ventilation is required to ensure correct operating temperatures of standard buy-out, custom fabricated, or remote refrigeration condensing units, or compressor rack assemblies, they shall so state in a letter to the Architect, for evaluation and decision.

**2.06 MISCELLANEOUS MATERIALS AND FABRICATION**

- A. Nameplates: Whenever possible, locate nameplates and labels on manufactured items, in accessible position, but not within customer's normal view. Do not apply name-plates or labels on custom fabricated work, except as required for compliance with governing regulations, insurance requirements, or operator performance.

- B. Manufactured Equipment Items: Furnish items as scheduled or herein specified. Verify dimensions, spaces, rough-in and service requirements, and electrical characteristics, before ordering. Provide trim, accessories and miscellaneous items for complete installation.
- C. Insert Pans:
1. General: Cut-outs, openings, drawers, or equipment specified or detailed to hold stainless steel insert pans shall be provided with a full complement of pans as follows:
    - a. One (1) stainless steel, 20-gauge (0.95mm) minimum, solid insert pan for each space, sized per plans, details, or specifications.
    - b. Where pan sizes are not indicated in plans, details, or specifications, provide one full-size pan for each opening.
    - c. Provide maximum depth pan to suit application and space.
  2. Provide 18-gauge (1.27mm) removable stainless steel adapter bars where applicable.
  3. All cut-outs and openings, or equipment specified or detailed to hold stainless steel insert pans, shall be provided with a hinged stainless steel removable night cover.
- D. Tray Slides: Before fabrication of counters with tray slides, verify:
1. Size and shape of tray. Edge of tray shall not overhang outer support/slider by more than 2". If edge of tray exceeds this dimension, notify Architect, in writing, for evaluation and adjustment, if necessary.
  2. Configuration of corners, turns, and shape of tray slides for proper support and safe guidance of trays.
  3. Tray slide to be capable of supporting 200 pounds per linear foot, live load.
- E. Self-leveling dispensers: Verify type and make of ware, dimensions and weight; and submit to the dispenser manufacturer, for proper sizing and calibration of dispensers.
- F. Carbon dioxide (CO<sup>2</sup>) equipment: Where equipment requires connection with compressed CO<sup>2</sup> cylinder for operation, provide 2-cylinder manifold and control system (integral with equipment) with proper connectors for Department of Transportation (DOT) approved type cylinders, complete with cylinder safety devices and supports.
- G. Reasonable quietness of operation of equipment is a requirement, and the Contractor will be required to replace or repair any equipment producing out-of-the-ordinary intolerable noise. This also includes providing and installing bumpers and gaskets for doors and drawers on fabricated and standard manufactured items, and sound insulation where feasible.

**PART 3 EXECUTION****3.01 SUPERVISION**

- A. A competent supervisor, representing the Contractor, shall be present at all times during progress of the Contractor's work.

**3.02 SITE EXAMINATION**

- A. Verify site conditions under the provisions of the General Conditions, Supplementary Conditions and applicable provisions of Division 1 Sections. Notify the Architect, in writing, of unsatisfactory conditions for proper installation of foodservice equipment.
- B. Verify wall, column, door, window, and ceiling locations and dimensions. Fabrication and installation should not proceed until dimensions and conditions have been verified and coordinated with fabrication details.
- C. Verify that wall reinforcement or backing has been provided, and is correct for wall supported equipment. Coordinate placement dimensions with wall construction Section.
- D. Verify that ventilation ducts are of the correct characteristics, and in the required locations.
- E. Verify that utilities are available, of the correct characteristics, and in the required locations.

**3.03 INSTALLATION**

- A. Sequence installation and erection to ensure correct mechanical and electrical utility connections are achieved.
- B. Install items in accordance with manufacturer's instructions.
- C. Set each item of non-mobile and non-portable equipment securely in place, leveled and adjusted to correct height. Anchor to supporting substrate where indicated, and where required for sustained operation and use without shifting or dislocation. Conceal anchorages wherever possible. Adjust counter tops and other work surfaces to a level tolerance of 1/16 inch (maximum offset, and plus or minus on dimension, and maximum variation in 2'-0" run from level or indicated slope). Provide anchors, supports, bracing, clips, attachments, etc., as required to comply with the local seismic restraint requirements. The Guidelines For Seismic Restraint Of Kitchen Equipment, as prepared for the Sheet Metal Industry Fund of Los Angeles and endorsed by S.M.A.C.N.A., should be followed.
- D. Complete field assembly joints in the work (joints which cannot be completed in the shop) by welding, bolting-and-gasketing, or similar methods as indicated and specified. Grind welds smooth and restore finish. Set or trim flush, except for "T" gaskets as indicated.
- E. Provide closure plates and strips where required, with joints coordinated with units of equipment.

- F. Provide sealants and gaskets all around each unit to make joints airtight, waterproof, vermin-proof, and sanitary for cleaning purposes.
- G. Joints up to 3/8 inch wide, to be stuffed with backer rod, to shape sealant bead properly, at 1/4 inch depth.
- H. At internal corner joints, apply sealant or gaskets to form a sanitary cove, of not less than 3/8 inch radius.
- I. Shape exposed surfaces of sealant slightly concave, with edges flush with faces of materials at joint.
- J. Provide sealant filled or gasketed joints up to 3/8 inch joint width. Wider than 3/8 inch, provide matching metal closure strips, with sealant application each side of strips. Anchor gaskets mechanically, or with adhesives to prevent displacement.
- K. Treat enclosed spaces, inaccessible after equipment installation, by covering horizontal surfaces with powdered borax at a rate of 4 ounces per square foot.
- L. Insulate to prevent electrolysis between dissimilar metals.
- M. Cut and drill components for service outlets, fixtures, piping, conduit, and fittings.
- N. Coordinate the installation of approved dry pendant sprinkler head in each cooler and freezer. Sprinkler heads should be installed in coolers/freezers only if required by local codes.
- O. Verify and coordinate the mounting heights of all wall shelves and equipment, with equipment located below them, for proper clearances.
- P. Coordinate with the Plumbing and Electrical Divisions, and provide holes in food service equipment for plumbing and electrical service to and through the fixtures, as required. This includes welded sleeves, collars, ferrules, or escutcheons. These services are to be located so that they do not interfere with intended use and/or servicing of the fixture.

**3.04 ADJUSTING**

- A. Test and adjust equipment, controls and safety devices to ensure proper working order and conditions.
- B. Repair or replace equipment which is found to be defective in its operation, including units which are below capacity or operating with excessive noise or vibration.

**3.05 CLEANING AND RESTORING FINISHES**

- A. After completion of installation, and completion of other major work in foodservice areas, remove protective coverings and clean foodservice equipment, internally and externally.
- B. Restore exposed and semi-exposed finishes, to remove abrasions and other damages; polish exposed metal surfaces and touch-up painted surfaces. Replace work, which cannot be successfully restored.
- C. Polish glass, plastic, hardware and accessories, fixtures and fittings.

- D. Wash and clean equipment, and leave in a condition ready for the Owner to sanitize and use.
- E. Clean casework, counters, shelves, hardware, fittings and fixtures.

**3.06 TESTING, START-UP AND INSTRUCTIONS**

- A. Begin the start-up of equipment after service lines have been tested, balanced, and adjusted for pressure, voltage and similar considerations; and until water and steam lines have been cleaned and treated for sanitation.
- B. Make arrangements for demonstration of foodservice equipment operation and maintenance, in advance with the Owner/Operator.
- C. Demonstrate foodservice equipment, to familiarize the Owner and the Operator on operation and maintenance procedures, including periodic preventative maintenance measures required. Include an explanation of service requirements and simple on-site service procedures, as well as, information concerning the name, address and telephone number of qualified local source of service. The individual performing the demonstration shall be knowledgeable of operating and service aspects of the equipment.
- D. Provide a written report of the demonstration, to the Owner, outlining the equipment demonstrated and malfunctions or deficiencies noted. Indicate individuals present at demonstration.
- E. Final Cleaning: After testing and start-up, clean the foodservice equipment, and leave in a condition ready for the Owner to sanitize and use.

**3.07 CLEAR AWAY**

Throughout the progress of their work, the Contractor shall keep the working area free from debris, and shall remove rubbish from premises resulting from work being done by them. At the completion of their work, the Contractor shall leave the premises in a clean and finished condition.

**PART 4 ITEMIZED SPECIFICATIONS:**

**4.1** All items listed in itemized specifications shall be furnished and set in place by the Kitchen Equipment Contractor as a sub to the General Contractor. Unless noted furnished by: Owner – Owner furnished installed by G.C. or Existing.

- |        |                                  |                                 |
|--------|----------------------------------|---------------------------------|
| Item 1 | Spare Number                     |                                 |
| Item 2 | Spare Number                     |                                 |
| Item 3 | Lockers                          | One (1) Lot Required<br>By G.C. |
| Item 4 | Dry Storage Shelving             | Five (5) Required               |
|        | <u>Metro, Model Super Erecta</u> |                                 |

Include:

- Four (4) Model 74P posts per section
- Five (5) Model 2448BR shelves per section (4 sections)
- Five (5) Model 2442BR shelves per section (1 section)

Item 5 Refrigeration Rack Platform One (1) Required

Refer to Sheet FS5.1 for details.

Item 6 Walk-in Freezer One (1) Required

Thermalrite

Include:

A. Walk-in cooler freezer combination to be prefabricated of modular panel construction. Of size and shape as shown on drawings. Interior ceiling height shall be a minimum of 8'-0". Verify all dimensions with building conditions for proper fit. Provide maximum size possible to fit available space. Walk-in shall be set on the building slab.

B. Wall, corner, partition, "T" and ceiling panels; built-in place floor insulation; doors and finish hardware; light fixtures and switches; temperature alarm systems; exterior digital thermometers; low-temperature door fan switches; closure panels and finish trim; coil supports; utility penetrations and escutcheons; pressure relief vents; corner guards; interior and exterior wall protection; and factory supervised installation.

C. Materials:

1. Insulation shall be full 4 inches thick, HCFC Free 141B. UL Class 1 rigid foamed-in-place polyurethane with a minimum 2.0 cubic foot density. The "K" factor shall be no more than 0.133 BTU per hour (at 20 degree F. of operation) per square foot, per inch thickness, per degrees F. of temperature difference. Heat transfer "U" factor shall not exceed .033 at – 20 degrees F. operation. Actual "R" value may vary with specific application. The "R" value shall be a minimum of 30.00. Insulation shall be 95% closed cell structure. Flame spread rating according to ASTM E-84/ UL 723 shall be 25 or less. Polyurethane foam shall be expanded with HCFC-141B insulation containing ozone depleting CFC's will not be acceptable

D. Panel Construction:

1. Panels shall be 4" thick modular sandwich type foamed in place without the use of wood or metal frame members.
2. Interior and exterior sheet metal facings shall be die formed, fully bonded to urethane core and with 1/2" to 3/4" flanged perimeter.
3. Exterior panels, interior partitions, corner panels, ceiling panels and "T" intersection panels shall be matching construction.



4. All interior vertical corners shall be coved with a NSF approved radius.
5. Alignment of adjoining panels shall be accomplished with a continuous tongue and groove in the urethane. Joints between panels shall be sealed at interior and exterior edges with a PVC double bubble attached to the flange and foamed as part of the panel gasket.
6. Panels, including ceiling, shall be connected and held in place by steel cam action locks, foamed in place not more than 4'-0" on center. The lock ports shall be finished with a snap-in PVC button.

E. Panel Fascia:

1. Interior face of panels shall be 26 ga. White sanisteel finish.
2. Interior ceiling panels shall be 26 ga. White sanisteel finish.
3. Exterior exposed face of panels shall be clad with 22 ga. stainless steel 304 #4.
4. Exterior unexposed face of panels shall be clad with 26 ga. Acrylume embossed.

F. Floor:

1. All cold storage rooms shall have depressed subfloor unless otherwise specified.
2. An asphalt emulsion subfloor membrane shall be applied to a clean, smooth, concrete subfloor and covered with foil coated Kraft waterproof paper (0.01 perm, as determined by ASTM-E96-66), extended under walls with joints lapped 6".
3. Floor insulation shall be rigid board foam urethane, 3 layers 2" thick each, joints staggered or splined. Installed after the wall panels are in place.
4. A vapor permeable separation shall be accomplished with fifteen (15) pound felt, protective slip sheet applied over the insulation with joints lapped 6" and flashed up wall the height of the base.
5. Interior and exterior finished base, floor and setting bed shall be furnished and installed by others.

G. Doors:

1. Door opening shall be 3'-0" width in clear by 6'-6" height in clear. Door shall be flush. Foot treadle at each door.
2. Insulation shall be 4" thick, foamed in place.

3. Provide a heating element on the ambient side of all doors head, jambs and threshold. The heating element shall be provided with thermostatic control, factory prewired to a "GS" splice box located above the door.
4. Furnish and install a removable threshold at all doors, constructed of aluminum extrusion or fiberglass reinforced plastic.
5. The door section shall provide a full 4 inches of polyurethane insulation. Frame interior and exterior finishes to be the same as adjoining panels. Door interior to be 20 gauge stainless steel and the exterior shall be 20 gauge stainless steel. The door shall be constructed to incorporate heavy duty, molded ABS breaker strip, which is permanently foamed-in-place. Bottom of door shall seal with an adjustable double sweep gasket, uniquely designed to provide complete seal between door, threshold, and door jamb. Door jamb to be a fully coved, extruded, welded, structural anodized aluminum, rigid frame design for easy cleaning and maintenance. Heater wire shall be provided in a electrically safe housing and be easily replaceable without the need for clips or special tools. All conduit for the inner-wiring of the door panel shall be totally concealed in the polyurethane foam panel, exposed conduit is not acceptable. Door section to be field wired to surface mounted junction box on the interior section to be field wired to surface mounted junction box on the interior door panel. The complete door section shall be UL listed and so labeled. The door location and swing to be as indicated in Specifications and Drawings.
6. .100 Aluminum tread kick plate, 3'-0" high and full width of door shall be mounted on the interior & exterior face of each door.
7. Hinges, three (3) each per door, shall be Kason Model 1248 cam lift, zinc die cast and polished chrome plated.
8. Handle shall be bright polished chrome finish, with deadbolt that can be independently locked with either key or padlock. Deadbolt can be locked in the unlocked position to prevent unauthorized locking of the door. Locking mechanism with inside release knob is mounted on the frame side of the door opening and includes no moving parts through frame. This design eliminates any possibility of lock freeze-up. Locking mechanism has no exposed fasteners to give maximum tamper resistance. Locked door can be opened from the inside.
9. Door closer shall be hydraulic Kason 1094 Sure Close.
10. Hardware shall be mounted with extra-large ½" thick, non-conducting synthetic tapping plates and machine hi/low screws.
11. Gasket shall be extruded polyvinyl chloride with vulcanized corners and continuous magnetic core at sides and top of door frame. The stainless steel jamb facing shall extend to protect the gasket.

12. Sill wipers shall be adjustable, extruded neoprene secured by removable stainless steel retainer strip and fastener. Double wipers at low temperature compartments.
13. Doors shall be adjusted, after installation and finished floor is complete, to be self-closing.
14. Doors shall be hinged as shown on the plans.
15. Each door to include a 14" x 24" viewport window with three-pane tempered SIGMA approved safety glass. Walk-in compartments operating at or below 35 degrees F. to have heated frames around the glass. Walk-in compartments operating below 32 degrees F. shall have heated frames and heated glass.
16. Provide interior door jamb guards of minimum 1/8" aluminum tread plate 48" high x 8" wide.

H. Light Fixtures and Switches:

1. Quantity of light fixtures shall be as indicated on the plan (of Code required foot candles).
2. Light fixtures shall be 48" LED vapor proof fixture ceiling mounted, cast aluminum, fully enclosed, gasketed, vapor tight, weather tight, with shatterproof, heat resistant diffuser, junction box.
3. Light fixture and junction box shall be furnished loose for installation in the field by the Electrician.
4. Light switches shall be three way or four way, AC, pressswitch, mounted in recessed "FS" boxes with gray Hypolan, weatherproof plate and pressswitch cover and unbreakable red plastic pilot light lens constant burning on interior and indicating on exterior.
5. Light switches shall be factory mounted on the latch side of doors and prewired with plastic flex conduit (UL, CSA approved) and wiring run within the wall panel, terminated in a vapor tight splice box mounted on the exterior of ceiling panel.

I. Digital Thermometer and Alarm:

1. Thermometer and alarm for each cold storage room. Provide Modularm Model 75LC (battery back-up).
2. Thermometer and alarm shall consist of audio alarm, silence button, trouble light, digital read out and stainless steel cover.
3. Thermometer alarm shall be mounted above the door on the exterior of each cold storage room, prewired with plastic flex conduit (UL, CSA

approved) and wiring run within the wall panel using "FS" recessed box on the exterior and terminated in a "GS" splice box mounted above the roof panel.

4. Ceiling penetration must be sealed.

J. Trim:

1. Open spaces between the cold storage room walls and building walls shall be closed with the same material that is being used on adjacent cold storage room walls.

K. Coil Supports:

1. Coil support rods of 1/2" diameter threaded nylon with plated steel nuts and washers for support of the evaporator coils shall be provided.

L. Utility Penetrations:

1. K.E.C. provide openings in ceiling and wall panels to accommodate all electrical, refrigeration and drain lines.
2. Seal all openings with silicone after lines have been run.

M. Escutcheons:

1. Provide sufficient quantity of 5" diameter blank stainless steel escutcheons to trim all interior and exposed exterior penetrations.
2. Cut proper size hole in blanks and panel penetrations not furnished by the Manufacturer.

N. Pressure Relief Vent:

1. Pressure relief vent shall be factory installed at each low-temperature cold storage room door.
2. Pressure relief vent shall be electrically heated, 120 volt and have aluminum screen.

Electrical: 120/60/1

Item 7 Freezer Coil One (1) Required

Cold Zone

Shall be as specified for Item 10

Item 8 Walk-in Cooler One (1) Required

Thermalrite

Shall be as specified for Item 6.

Item 9 Cooler Coil One (1) Required

Cold Zone

Shall be as specified for Item 10.

Item 10 Refrigeration System One (1) Required

Cold Zone, Model Mini-Pak MPL-2  
Include:

The outdoor air-cooled, refrigeration system is to be U.L. Listed and will be located on the roof of the building. This unit includes the outdoor weather housing, compressors, copper finned condenser core, electrical control panel, all housed within a single assembly and the evaporator coil assemblies, all with the required options and accessories. All of the component parts, options and accessories will be provided, mounted, piped and wired, as required by the manufacturer. The system shall be manufactured to operate at 208-230 volts/3 phase/60 hertz. The refrigeration system shall have the following compressors and evaporator coils:

SYS	DESCRIPTION	COMPRESSOR	EVAPORATORS
A	Walk-In Freezer	ZF11K4E	AE36-120B
B	Walk-In Cooler	RST97C1E	AA28-106B

1.1 FRAME AND HOUSING

The outdoor weather shall include a welded, de-burred and cleaned structural steel frame made of 12 gauge. The exterior housing and access doors will be manufactured of a minimum of 16 gauge galvanized steel which has been assembled and cleaned. The frame and shall be painted with a primer coat of epoxy based paint and finished with a coat of polyurethane acrylic enamel.

1.2 COMPRESSOR AND CONDENSER SYSTEMS

1.2.1 COMPRESSOR SYSTEMS

All compressors will be Copeland Hermetic and/or Semi-Hermetic style. All medium compressors will be manufactured to operate with R-404A refrigerant; low temperature compressors will be manufactured to operate with R-404A refrigerant.

Each Compressor system shall be filled with refrigerant compatible refrigeration oil by the manufacturer and will include discharge and suction line vibrasorbers, oil separator, dual pressure control with stainless steel braided control piping, liquid line filter-dryer, moisture indicating sight glass and water regulating valve.

Each of these systems shall also include a receiver tank capable of accepting all of the system refrigerant without exceeding 90% of its volumetric capacity. Each receiver will be provided with a pressure relief vent and, at its inlet and outlet, a roto-lock isolation valve with a service port. Additionally, all compressor systems that will operate at suction temperatures below 0° F shall include a suction line accumulator and compressor body cooling fan. All of the internal refrigeration piping is to be held in place with Uni-Strut channels and clamps and protected with neoprene grommets. A minimum of 1/2 inch thick insulation shall cover all suction lines and suction line accumulators.

### 1.2.2 CONDENSER SYSTEMS

The condenser system shall include a multi-circuited condenser, 1/3 horsepower condenser fan motors with 20 inch fan blades mounted in a venturi contoured air scoop protected by plastic coated fan guards, and flooded headpressure controls. The condenser core will be made of copper fins to retard salt air deterioration. The compressors and condenser circuits shall be sized to operate at an average temperature differential between the ambient and condensing temperatures of 20° F.

### 1.3 CONTROL PANEL

The exterior mounted, weather tight, electrical control panel will be manufactured of 16 gauge galvanized steel which has been assembled, welded, de-burred and cleaned. The control panel shall be protected by an exterior mounted NEMA 3R rated fused disconnect switch and will include a removeable cover, circuit breakers, start capacitors, and fan cycle control thermostats for each of the condenser fan mototrs. A wiring diagram of the refrigeration system shall be provided and mounted inside of the refrigerated system. All internal wiring shall be shown on the wiring diagram.

### 1.4 EVAPORATOR COILS

The evaporator assemblies, and the parts associated with them, will be mounted inside of the walk-ins. Each evaporator coil shall include a thermostatic expansion valve, liquid line solenoid valve and thermostat piped, mounted and wired by the manufacturer.

## 2.0 INSTALLATION OF REFRIGERATION SYSTEM

The refrigeration system shall be installed in a neat and orderly manner that conforms to all pertinent local and national codes.

### 2.1 REFRIGERATION CONTRACTOR

The installing refrigeration contractor shall obtain all permits, mount evaporator coils and controls, provide and install refrigerant piping, fittings, hangers, supports, hook-up and start-up as per COLDZONE'S Preparation and Start-up Procedure. The Preparation and Start-Up Procedure shall be filled out, signed and returned to COLDZONE within ten (10) days of start-up.

All copper tubing shall be refrigerant grade type L. Sil-Fos 15 solder shall be used. After the system and evaporator coils have been connected, the balance of the system shall be leak tested with all valves open. The complete system shall be evacuated to a vacuum of 1500 microns absolute pressure. At this point the vacuum will be broken by the introduction of refrigerant into the system. Each system shall be fully charged with R-404A refrigerant. This contractor shall be responsible for testing and adjusting each compressor/condensing system to make the total system operational.

This contractor shall provide a drain line heater for each evaporator coil located within a compartment with an operating temperature at or below + 32° F. After installation of the drain line heater the condensate drain line shall be wrapped with 1/2 inch of armaflex insulation.

All refrigeration suction lines shall be wrapped with cellular type insulation. The insulation for systems with an evaporating temperature of + 25° F or higher shall be a minimum of 1/2 inches thick. Systems with an evaporating temperature below +25°F shall be wrapped with a minimum of 3/4 inch thick insulation. The insulation shall fit the tubing snugly, with no gaps, and shall be applied and sealed in accordance with the manufacturer's instructions.

All refrigeration suction lines shall have 'P' traps as close to the exit of the evaporator coils as possible and at the bottom of all vertical rises. If the vertical rise exceeds 20 feet an additional 'P' trap shall be installed every 15 feet.

The refrigeration piping shall be sloped downward, from directly above each evaporator coil to the area where the piping rises to meet the remote refrigeration system, 1 inch for each 20 feet of horizontal distance.

UTMOST CARE MUST BE TAKEN TO PREVENT MOISTURE FROM GETTING INTO THE REFRIGERATION SYSTEM. Do not leave the system open to the atmosphere for longer than 15 minutes. The maximum content after complete installation shall be no more than 80 parts per million (PPM). After running the system the system moisture level shall be no more than 10 PPM.

## 2.2 ELECTRICAL CONTRACTOR

The electrical contractor shall provide power to the refrigeration system and all control and defrost wiring as called for in the COLDZONE wiring diagrams. This contractor shall also connect the condensate drain line heaters at the electrically defrosted evaporator coils. All electrical wiring shall be in accordance with the COLDZONE wiring diagrams and all local codes.

## 2.3 PLUMBING CONTRACTOR

The plumbing contractor shall provide type 'L' copper condensate drain lines for the evaporator coils in all walk-ins, pitched 1/4 inch per foot of run. Condensate drain lines shall have a 'P' trap, outside of the refrigerated space as close to the floor sink as possible. This contractor shall provide water piping to the refrigeration system supply and return. The water supply shall be at a maximum pressure of 125 pounds and at a flow rate as indicated on the refrigeration schedule drawings. A manual shut-off valve shall be installed by this contractor for both the water supply and return lines. All plumbing installation shall be in accordance with local codes.

## 2.4 GENERAL CONTRACTOR

The general contractor shall provide a level platform for the refrigeration system, all roof and wall penetrations, all required concrete coring and will seal and make weather tight all of these items. This contractor shall provide all lifting services for the refrigeration system and all other required materials. All of this contractors work shall be in accordance with the plans and specifications and COLDZONE'S refrigeration drawings and in accordance with all local codes

Item 11 Walk-in Shelving One (1) Lot Required

Metro, Model Metromax Q

Include:

- Four (4) Model MQ63UPE posts per section (10 sections)
- Four (4) Model MQ2442G shelves per section (8 sections)
- Four (4) Model MQ2460G shelves per section (2 sections)
- Two (2) Model 5MPX casters per section
- Two (2) Model 5MPBX casters per section

Item 12 Mixer (40 qt.) One (1) Required

Hobart, Model HL400

Include:

Standard accessory package

Electrical: 208/60/1

- Item 13 Pre-Rinse One (1) Required  
Fisher, Model 53430
- Item 14 Vegetable Prep Sink One (1) Required  
 Custom built. Refer to details on Sheet FS-501. Provide One (1) Fisher Model 13250 faucet.
- Item 15 Disposer One (1) Required  
In-Sink-Erator, Model SS-150-15A-AS101  
 Electrical: 208/60/3
- Item 16 Table/Wall Shelf/Sink One (1) Required  
Advance Tabco, Model KMS-306  
 Include:  
 Right side splash  
 Model WS-12-72 wall shelf  
 Model TA-11A
- Item 17 Mobile Rack One (1) Required  
 By Owner
- Item 18 Hand Sink One (1) Required  
Advance Tabco, Model 7-PS-62  
 Include:  
 Left and right side splash guards
- Item 19 Table One (1) Required  
Advance Tabco, Model SS-3010  
 Include:  
 Two (2) Model TA-62 duplex outlets
- Item 20 Slicer One (1) Required  
Hobart, Model HS7  
 Include:  
 Food chute  
 Electrical: 120/60/1
- Item 21 Food Processor One (1) Required  
Hobart, Model FP150  
 Include:  
 6-pack plates  
 Electrical: 120/60/1



Item 22 Exhaust Hood One (1) Required

Gaylord, Model ELXGBD-A-AS-60

Include:

Refer to Sheet FS-602.

Size: 15'-6" long x 60" wide, built in one section

In accordance with NFPA 96, UL listed and NSF approved.

Furnish and set in place per manufacturer's specifications.

Three (3) 4'-0" long recessed fluorescent lights.

Pre-piped Ansul surface fire suppression system.

Remote fire switch.

All necessary trim and closure panels.

Hanger rods, seismic restraints and accessories required for installation.

Installation by a certified Gaylord installer.

Electrical: 120/60/1

Item 23 Spare Number

Item 24 Fire Protection System One (1) Required

Ansul, Model R-102

Include:

Refer to Sheet FS-602

Ansul Fire System factory pre-piped wet chemical lines including duct, plenum and appliance drops with all nozzles installed per cooking equipment arrangement on Gaylord drawings.

Designed to protect the cooking shown on the drawings and listed in the specifications. All

exposed chemical piping chrome plated or chrome sleeved. Includes factory pre-piped

concealed detection lines with recessed detector brackets. The fire protection system and its

installation shall meet NFPA 95, NFPA 17A, and all applicable local and state codes. Installation by certified factory installer.

Electrical: 120/60/1

Item 25 Convection Oven (Double) One (1) Required  
Existing

Item 26 Convection Oven (Double) One (1) Required

Blodgett, Model Zephaire-100-E

Electrical: 208/60/3

Item 27 Steamer One (1) Required

Market Forge, Model 3500M24E

Include:

Filter System.

Electrical: 208/60/3

Item 28	Open Burner Range  <u>Garland, Model 36ES15</u> Include: 6" stainless steel legs	One (1) Required
Item 29	Tilting Kettle/Stand (40 qt.)  <u>Groen, Model TDBC-40</u> Include: Double pantry faucet Lift-off cover Stand mounting Kettle brush kit Model TS/9-2 stand  Electrical: 208/60/3	One (1) Required
Item 30	Stainless Steel Wall Flashing  Custom built. Refer to details on Sheet FS-501.	One (1) Required
Item 31	Spare Number	
Item 32	Spare Number	
Item 33	Refrigerator  <u>True, Model STA1R-1S</u> Include: Right hinged door Kit #3 shelving  Electrical: 120/60/1	One (1) Required
Item 34	Heated Cabinet	Two (2) Required Existing
Item 35	Hand Sink  <u>Advance Tabco, Model 7-PS-25</u>	One (1) Required
Item 36	Spare Number	
Item 37	Entrée Counter	One (1) Required  Existing
Item 38	Spare Number	
Item 39	Sneeze Guard	One (1) Required Existing

Item 40	Spare Number	
Item 41	Hot Food Counter	One (1) Required Existing
Item 42	Spare Number	
Item 43	Spare Number	
Item 44	Sneeze Guard	One (1) Required Existing
Item 45	Spare Number	
Item 46	Spare Number	
Item 47	Spare Number	
Item 48	P.O.S. Counter	One (1) Required Existing
Item 49	P.O.S. System	Two (2) Required By Owner
Item 50	Pizza Counter	One (1) Required Existing
Item 51	Heated Display	One (1) Required Existing
Item 52	Sneeze Guard	One (1) Required Existing
Item 53	Spare Number	
Item 54	Deli Counter	One (1) Required

Atlas Metal, Model BLC-5-RM

Include:

- Plastic laminate front and end panels (Wilsonart Graphite Nebula #4623-60)
- One (1) Model SLS tray slide
- Bottom shelf
- Provide 10'-0" cord and plug. Cord and plug on right side when facing rear side.
- Compressor on the right

Item 55	Sneeze Guard	One (1) Required
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Atlas Metal, Model CSG-ASG-5

Item 56	Spare Number	
Item 57	Table	One (1) Required By Owner

Item 58	Microwave Oven	One (1) Required By Owner
Item 59	Milk Cooler  <u>True, Model TMC-34-S-DS-SS</u> Include: Stainless steel exterior	Two (2) Required
Item 60	Salad Bar  <u>Atlas Metal, Model BLC-4-RM</u> Include: Plastic laminate front, both ends, and back panel (Wilsonart Graphite Nebula #4623-60) Two (2) stainless steel Model SLS tray slides Bottom shelf	One (1) Required
Item 61	Sneeze Guard  <u>Atlas Metal, Model CSG-ASG-4</u>	One (1) Required
Item 62	Salad Bar	One (1) Required Existing
Item 63	Sneeze Guard	One (1) Required Existing
Item 64	Soiled Dish Counter  Custom built. Refer to details on Sheet FS5.1.	One (1) Required
Item 65	Disposer  <u>In-Sink-Erator, Model SS-200-7-AS101</u>  Electrical: 208/60/3	One (1) Required
Item 66	Pre-Rinse  <u>Fisher, Model 68241</u>	One (1) Required
Item 67	Spare Number	
Item 68	Dishwasher/Booster  <u>Hobart, Model CL44E</u> Include: 30KW booster heater Higher than standard chamber Left to right operation Conveyor dwell  Electrical: 208/60/3	One (1) Required

- Item 69 Condensate Hood One (1) Required  
Gaylord, Model VH2-W-42  
Include:  
Refer to details on Sheet FS-603  
Size: 5'-6" long x 3'-6" wide
- Item 70 Clean Dish Table One (1) Required  
Custom built. Refer to details on Sheet FS501.
- Item 71 3-Compartment Sink One (1) Required  
Custom built. Refer to details on Sheet FS501. Provide two (2) Fisher Model 13250 faucets.
- Item 72 Wall Shelf One (1) Required  
Advance Tabco, Model WS-12-84
- Item 73 Hand Sink One (1) Required  
Advance Tabco, Model 7-PS-62  
Include:  
Right side splash guard
- Item 74 Drying Racks Two (2) Required  
Metro, Model Metromax i  
Include:  
Four (4) Model MX63UP posts per section  
Four (4) Model MX2448G shelves per section  
Two (2) Model 5MPX casters per section  
Two (2) Model 5MPBX casters per section

**END OF SECTION**

## PROJECTION SCREENS

### PART 1 GENERAL

#### 1.01 SECTION INCLUDES

- A. Front projection screen assemblies.
- B. Electric operation.

#### 1.02 RELATED REQUIREMENTS

- A. Section 03 30 00 - Cast-In-Place Concrete: Support for wall mounted projection screens.
- B. Section 05 50 00 - Metal Fabrications: Supports for suspended projection screens.
- C. Section 09 21 16 - Gypsum Board Assemblies: Wall framing system and backing.
- D. Section 26 05 00 - Common Work Results for Electrical: Electrical connections.

#### 1.03 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Manufacturer's catalog cuts and descriptive information on each product to be used, including:
  - 1. Preparation instructions and recommendations.
  - 2. Storage and handling requirements and recommendations.
  - 3. Installation methods.
  - 4. Wiring diagrams for motor operators and actuators, and controls and switches.
- C. Shop Drawings: For custom installations, indicate dimensions, verified field measurements, mounting details, and interface with adjacent construction.
- D. Samples: For screen fabrics, submit two samples 6 x 6 inch in size.
- E. Operation and Maintenance Data: Provide manufacturer's operation and maintenance instructions.
- F. Warranty: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

#### 1.04 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Experienced in manufacturing products specified in this section.
- B. Installer Qualifications: Experienced in installation of the work of this section.

#### 1.05 DELIVERY, STORAGE, AND HANDLING

- A. Deliver projection screens to project site in manufacturer's original unopened packaging. Inspect for damage and size before accepting delivery.
- B. Store in a protected, clean, dry area with temperature maintained above 50 degrees F. Stack according to manufacturer's recommendations.
- C. Acclimate screens to building temperatures for 24 hours prior to installation, or in accordance with manufacturer's recommendations.

#### 1.06 FIELD CONDITIONS

- A. Maintain interior of building between 60 degrees F and 75 degrees F during and after installation of projection screens.

**PART 2 PRODUCTS****2.01 FRONT PROJECTION SCREENS - ELECTRIC**

- A. Manufacturers:
  1. Da-Lite Screen Company, Model Tensioned Advantage Electrol: [www.da-lite.com](http://www.da-lite.com).
  2. Draper, Inc (Motorized); Premier: [www.draperinc.com](http://www.draperinc.com).
  3. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Type: Front projection; factory assembled unless otherwise indicated.
- C. Matte Light Diffusing Fabric: Light diffusing screen fabric; washable, flame retardant and mildew resistant.
  1. Material: High contrast gray vinyl on fiberglass backing, with nominal gain of 0.8 over viewing angle not less than 70 degrees from axis, horizontally and vertically.
  2. Seams: No seams permitted in fabric.
- D. Masking Borders: Black, on four sides.
- E. Extra Drops: Black, as required to properly position viewable area of screen.
- F. Exposed Screen Cases: Steel; integral roller brackets.
  1. Finish: Baked enamel.
  2. Color: As selected.
  3. End Caps: Steel; finished to match case.
  4. Mounting: Wall and ceiling, as indicated on drawings.
- G. Electrically-Operated:
  1. Roller: 2 inch aluminum, with locking device.
  2. Vertical Tensioning: Screen fabric weighted at bottom with steel bar with plastic end caps.
  3. Horizontal Tensioning: Tab-guided cable system.
- H. Provide mounting hardware, brackets, supports, fasteners, and other mounting accessories required for a complete installation, in accordance with manufacturer's recommendations for specified substrates and mountings.

**2.02 ELECTRICAL COMPONENTS**

- A. Electrical Components: Listed and classified by UL as suitable for the purpose specified and indicated.
- B. Motors: Direct drive, 110 V, 60 Hz.
  1. Screen Motor: Mounted inside roller; three wire with ground; quick reverse type; equipped with thermal overload cut-off.
    - a. Electrical Characteristics: 1.2 amps.
    - b. Motor mounted on sound absorber.
  2. Door and Adjustable Masking Motor: Mounted inside roller; three wire with ground; quick reverse type; equipped with thermal overload cut-off.
    - a. Electrical Characteristics: 1.2 amps.
- C. Controls: 3 position control switch with plate.
  1. Provide 1 control stations to screen, with internal override to prevent more than one signal reaching the screen.
  2. Security: Provide key operated switch; provide 2 keys.

**PART 3 EXECUTION****3.01 EXAMINATION**

- A. Verify that substrate is finished and ready to accept screen installation.
- B. If substrate preparation is the responsibility of another installer, notify Contractor of unsatisfactory preparation before proceeding.

- C. Verify type and location of electrical connections.
- D. Do not install projection screens until climate control systems are in place and interior painting and other finishes are completed.

**3.02 PREPARATION**

- A. Coordinate screen installation with installation of projection systems.
- B. Coordinate installation with adjacent construction and fixtures, including ceilings, walls, lighting, fire suppression, and registers and grilles.

**3.03 INSTALLATION**

- A. Install in accordance with manufacturer's instructions, using manufacturer's recommended hardware for relevant substrates.
- B. Do not field cut screens.
- C. Install screens in mountings as specified and as indicated on drawings.
- D. Install plumb and level.
- E. Install electrically operated screens ready for connection to power and control systems by others.
- F. Adjust projection screens and related hardware in accordance with manufacturer's instructions for proper placement and operation.
- G. Test electrical screens for proper working condition. Adjust as needed.

**3.04 PROTECTION**

- A. Protect installed products until completion of project.
- B. Touch up, repair, or replace damaged products before Substantial Completion.

**3.05 SCHEDULE**

- A. Gymnasium 165: 15 feet x 20 feet, motorized operation; wall mounted.
- B. Commons 181: 15 feet x 10 feet, motorized operation; ceiling mounted.
- C. Choral 186: 15 feet x 10 feet, motorized operation; ceiling mounted.
- D. Drama/Platform 184: 15 feet x 10 feet, motorized operation; ceiling mounted.

**END OF SECTION**



## KILNS

### **PART 1 GENERAL**

#### **1.01 SECTION INCLUDES**

- A. Reinstallation of existing electric kiln.

#### **1.02 RELATED SECTIONS**

- A. Section 02 41 00 - Demolition: Salvage of existing kiln for reinstallation in new building.
- B. Section 26 05 00 - Common Works Results for Electrical: Electrical connections.

#### **1.03 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on kilns.
- C. Manufacturer's Instructions. Indicate installation instructions and special procedures.
- D. Maintenance Data: Include recommended cleaning methods, routine and special maintenance.

#### **1.04 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company specializing in manufacturing products of this section with minimum five years documented experience.
- B. Source Limitations: Obtain kilns, ventilation systems, and accessories through one (1) source from a single manufacturer. Kiln and ventilation system to be UL listed as a system.
- C. Regulatory Requirements: Comply with provisions of the following product certifications:
  1. NFPA: Provide kilns and ventilation systems listed and labeled as defined in
  2. NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
  3. UL and NEMA: Provide electrical components required as part of kilns and ventilation systems that are listed and labeled by UL and that comply with applicable NEMA standards.

#### **1.05 DELIVERY, STORAGE AND HANDLING**

- A. Deliver kilns, ventilation systems, and accessories in manufacturer's original packaging with protective covering intact.
- B. Do not stack other items on top of packaged kilns during transportation and storage.
- C. Stack kilns with top end up.
- D. Utilize equipment capable of moving the kiln and packaging without damage and install kilns into location.
- E. Protect from damage due to weather, excessive temperature, and construction operations.

#### **1.06 WARRANTY**

- A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.
- B. Special Warranties: Manufacturer's standard form in which manufacturer of each kiln specified agrees to repair or replace kilns that fail in materials or workmanship within specified warranty period. Warranty includes labor for repair or replacement.
  1. Kiln: Two-year limited warranty.

### **PART 2 PRODUCTS**

#### **2.01 ELECTRIC KILNS**

- A. Electric Kiln: Existing to be reinstalled.

- B. Electrical Characteristics:
  - 1. Connection: Verify.

### **PART 3 EXECUTION**

#### **3.01 EXAMINATION**

- A. Verify conditions prior to commencing installation.
- B. Verify proper electrical services and location of connection points.
- C. Examine substrates, areas, and conditions where kilns, ventilation systems, and accessories, for compliance with requirements that affect installation and with requirements for installation tolerances. Notify the Architect in writing of conditions detrimental to proper completion of the work.
- D. Do not proceed with work until unsatisfactory conditions have been corrected.

#### **3.02 INSTALLATION**

- A. Install in accordance with manufacturer's written installation instructions and recommendations.
- B. Coordinate installation with adjacent work to ensure proper clearances.
- C. Install units in final locations after finishes have been completed in each area. Verify that clearances are adequate to properly operate equipment.
- D. Provide a minimum of 18 inches between kiln and adjacent walls, shelving, and other obstructions.
- E. Set units level, plumb, properly aligned, and securely in place.

#### **3.03 CLEANING AND PROTECTION**

- A. Test kilns, ventilation systems, and accessories to verify proper operation. Make necessary adjustments.
- B. Verify that accessories required have been furnished and installed.
- C. Remove packing material and leave kilns in clean condition, ready for operation.

**END OF SECTION**

## STAGE CURTAINS

### PART 1 GENERAL

#### 1.01 SECTION INCLUDES

- A. Stage curtains.
- B. Curtain track assemblies.
- C. Mounting accessories.

#### 1.02 RELATED SECTIONS:

- A. Section 05 12 00 - Structural Steel: Steel supports.
- B. Section 09 21 16 - Gypsum Board Assemblies: Framing and furring.
- C. Section 09 90 00 - Painting and Coating: Field finishes.

#### 1.03 REFERENCES

- A. ASTM A 153 - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware
- B. ASTM A 526 - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process, Commercial Quality.
- C. ASTM B 221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
- D. NFPA 701 - Standard Methods of Fire Tests for Flame Propagation of Textiles and Films.

#### 1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Manufacturer's literature, catalog cuts, and other data to demonstrate compliance with the specified requirements.
- C. Certification: Curtain Fabric, certification of compliance with flame resistance requirements
- D. Shop Drawings: Shop drawing and details sufficient to enable adequate provision in the work of adjacent trades to interface with the work of this section.

#### 1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.
- B. Installer's Qualifications: Company specializing in the products specified in this section with minimum five years documented experience.
- C. Curtain Flame Spread Resistance: Certified to comply with California Flame Resistance Regulation No. A-358-NFPA 701 small scale approved after 10 solvent dry cleanings. Permanently label curtains as one of the following:
  - 1. Permanently and inherently flame resistant
  - 2. Requires flame resistant treatment after dry cleaning.

#### 1.06 PROJECT CONDITIONS

- A. Coordinate the work with installation of structural supports and framing.
- B. Take field measurement to determine sizes required.
- C. Verify conditions at site affecting work to ensure the best and most complete installation per industry standards.
- D. Do not start installation curtains until after wall and ceiling finishes are complete.

**PART 2 PRODUCTS****2.01 STAGE CURTAINS**

- A. Front Curtain Fabric:
1. Material: Woven cotton velour, napped fabric of 100% cotton, 54 inch width minimum; not less than 43 backing ends per inch, 21.6 pile ends per inch, and 30 picks per inch; 660 pile tufts per square inch; fire-retardant treated; other characteristics as follows:
  2. Fabric Weight: Fabric weighing not less than 23 ounces per linear yard before flame proofing, with pile height of approximately 125 mils.
  3. Curtain to be double sided for viewing from both sides.
  4. Color: To match K&M 1053 Corn Flower Blue.
  5. Manufacturers:
    - a. DeBall by Stagecraft Industries, Inc.
    - b. Memorable by K&M Fabrics, Inc.
    - c. Wilson by Melfabco, Inc.
    - d. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Cyclorama Curtain Fabric:
1. Material: 100% cotton muslin; plain-woven; fire-retardant treated.
  2. Fabric Weight: 6.6 oz/yd.
  3. Color: Black.
  4. Products:
    - a. Black Muslin by S & K Theatrical Draperies: [www.sktheatricaldraperies.com](http://www.sktheatricaldraperies.com).
    - b. Substitutions: See Section 01 60 00 - Product Requirements.

**2.02 TRACKS**

- A. Front Curtain Track System:
1. Track: Aluminum; fabricate of not less than 11 gauge extruded aluminum, with track in one continuous piece. Provide curtain carriers of molded nylon or aluminum bodies with nylon ball-bearings wheels. Provide end stops for track.
  2. Products:
    - a. Atlas Silk Model 101 by H & H Specialties, Inc: [www.hhspecialties.com](http://www.hhspecialties.com).
    - b. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Cyclorama Curtain Track System:
1. Track: Aluminum; fabricate of not less than 11 gauge extruded aluminum, curve sections as indicated on Drawings. Provide curtain carriers of molded nylon or aluminum bodies with nylon ball-bearings wheels. Provide end stops for track.
  2. Product:
    - a. Atlas Silk Series 300 by H & H Specialties, Inc: [www.hhspecialties.com](http://www.hhspecialties.com).
    - b. Substitutions: See Section 01 60 00 - Product Requirements.

**2.03 FABRICATION - CURTAINS**

- A. General: Provide not less than 50% additional fullness for curtains, unless otherwise indicated. Horizontal seams and fabric less than half-width are not permitted. Curtain to be double sided.
- B. Vertical Hems: Provide vertical hems not less than 3 inches wide, double-stitched and machine-sewn with no salvage material visible from front of curtain.
- C. Turnbacks: Provide turnbacks, formed by folding 24 inches of face fabric back at each end of panels and securing by sewing across top hem grommets through both layers of fabric. Do not new turnbacks vertically.
- D. Top Hems: Reinforce top hems by double-stitching 3-1/2 inches wide heavy jute webbing to top edge with minimum 1inch of face fabric turned under.

- E. Pleats: Provide fullness in curtains by sewing 6 inches of additional material into box pleats spaced at 12 inches centers along top hem reinforcing. Provide not less than #2 brass grommets spaced at 12 inches and centered on box pleats, for tie lines or "S" hooks.
- F. Bottom Hems: Except for curtains which hang to floor, provide bottom hems not less than 6 inches deep. For floor-length curtains, provide 6 inches hems with separate cadmium-plated jack chain. Stitch chain pocket so chain rides 2 inches above bottom edge of curtain.

**PART 3 EXECUTION**

**3.01 EXAMINATION**

- A. Verify that support are set and openings are ready to receive the work.
- B. Determine that conditions are acceptable to receive the work of this section. Do not proceed with the work until unsatisfactory conditions have been corrected in a manner acceptable to the installer. Starting of the work will be construed as acceptance of conditions.

**3.02 INSTALLATION**

- A. Install stage curtains and tracks in accordance with manufacturer's instructions.
- B. Provide track mounting brackets, suspension rods, diagonal braces and other devices recommended by manufacturer for suspension system.
- C. Coordinate with other work above ceiling
- D. Install protective cover on track after installation and before adjacent ceilings are installed.
- E. Curtains: Install curtains to track carriers with heavy-duty "S" hooks or snap hooks.

**3.03 CLEANING**

- A. Clean materials just prior to occupancy.

**END OF SECTION**

**GYMNASIUM EQUIPMENT****PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Basketball backboards, goals, and support framing.
- B. Floor anchors for tensioned elements.
- C. Floor sleeves for net and goal posts.
- D. Wall mounted protection pads.
- E. Volleyball nets and posts.
- F. Scoreboards.

**1.02 RELATED REQUIREMENTS**

- A. Section 03 30 00 - Cast-in-Place Concrete: Concrete floor slab to receive floor sleeves and anchors.
- B. Section 04 27 31 - Reinforced Unit Masonry. Wall support.
- C. Section 05 50 00 - Metal Fabrications: Secondary structural members supporting gymnasium equipment.
- D. Section 09 64 66 - Wood Athletic Flooring: Gymnasium flooring.
- E. Section 26 05 00 - Common Work Results for Electrical: Equipment Wiring.

**1.03 REFERENCE STANDARDS**

- A. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2014.
- B. AWS D1.1/D1.1M - Structural Welding Code - Steel; American Welding Society; 2010 w/Errata.
- C. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- D. NFPA 255 - Standard Method of Test of Surface Burning Characteristics of Building Materials; National Fire Protection Association; 2006.
- E. NFPA 286 - Standard Methods of Fire Tests for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth; 2011.

**1.04 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide manufacturer's data showing configuration, sizes, materials, finishes, hardware, and accessories; include:
  - 1. Electrical characteristics and connection locations.
  - 2. Fire rating certifications.
  - 3. Structural steel welder certifications.
  - 4. Manufacturer's installation instructions.
- C. Shop Drawings: For custom fabricated equipment indicate, in large scale detail, construction methods; method of attachment or installation; type and gage of metal, hardware, and fittings; plan front elevation; elevations and dimensions; minimum one cross section; utility requirements as to types, sizes, and locations.
- D. Samples: Submit samples of wall pad coverings in manufacturer's available range of colors.
- E. Operating and maintenance data, for each operating equipment item.

- F. Warranty: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

#### **1.05 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years of documented experience.
- B. Installer Qualifications: Company specializing in performing work of the type specified with minimum three years of experience.

#### **1.06 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver products to project site in manufacturer's original packaging with factory original labels attached.
- B. Store products indoors and elevated above floor; prevent warping, twisting, or sagging.
- C. Store products in accordance with manufacturer's instructions; protect from extremes of weather, temperature, moisture, and other damage.

#### **1.07 PROJECT CONDITIONS**

- A. Coordinate size of access and route to place of installation.
- B. Coordinate equipment installation with size, location, and installation of service utilities.

### **PART 2 PRODUCTS**

#### **2.01 GYMNASIUM EQUIPMENT - GENERAL REQUIREMENTS**

- A. See drawings for sizes and locations.
- B. Provide mounting plates, brackets, and anchors of sufficient size and strength to securely attach equipment to building structure; comply with requirements of contract documents.
- C. Hardware: Heavy duty steel hardware, as recommended by manufacturer.
- D. Electrical Wiring and Components: Comply with NFPA 70; provide UL-listed equipment.
- E. Structural Steel Fabrications: Welded in accordance with AWS D1.1/D1.1M, using certified welders.

#### **2.02 BASKETBALL**

- A. Basketball System: Backstop assembly, backboard, and goal.
- B. Wall-Mounted Backstop Assemblies (Interior, Gymnasium 2): Wall-mounted steel frame assembly capable of mounting both rectangular and fan-shaped backboards.
  1. Distance of Backboard From Wall: Field verify.
  2. Framing: Side-folding retractable framing.
  3. Folding Operation: Manual.
  4. Height Adjuster: Raises or lowers assembly by 2 feet to adjust goal height.
  5. Height Control System: Manual winch.
  6. Framing Color: White.
  7. Manufacturers:
    - a. Draper, Inc: [www.draperinc.com](http://www.draperinc.com).
    - b. Porter Athletic Equipment Company: [www.porterathletic.com](http://www.porterathletic.com).
    - c. Performance Sports Systems: [www.perfsports.com](http://www.perfsports.com).
    - d. Substitutions: See Section 01 60 00 - Product Requirements.
- C. Wall-Mounted Backstop Assemblies (Exterior): Wall-mounted steel frame assembly capable of mounting both rectangular and fan-shaped backboards.
  1. Distance of Backboard From Wall: Field verify.

2. Framing: Stationary framing.
  3. Height Control System: Manual winch.
  4. Framing Color: White.
  5. Manufacturers:
    - a. Draper, Inc: [www.draperinc.com](http://www.draperinc.com).
    - b. Porter Athletic Equipment Company: [www.porterathletic.com](http://www.porterathletic.com).
    - c. Performance Sports Systems: [www.perfsports.com](http://www.perfsports.com).
- D. Ceiling-Suspended Backstop Assemblies (Interior, Gymnasium 1): Capable of mounting rectangular backboards.
1. Framing: Center strut; forward folding framing.
  2. Folding Control System: Electric hoist; folds backstop with 115 volt actuator; integral limit switches provide automatic shut-off in both positions; provide safety catch with automatic reset.
  3. Height Adjuster: To raise/lower assembly by 2 feet to adjust goal height.
  4. Height Control System: Manual winch.
  5. Framing Color: White.
  6. Manufacturers:
    - a. Draper, Inc: [www.draperinc.com](http://www.draperinc.com).
    - b. Porter Athletic Equipment Company: [www.porterathletic.com](http://www.porterathletic.com).
    - c. Performance Sports Systems: [www.perfsports.com](http://www.perfsports.com).
    - d. Substitutions: See Section 01 60 00 - Product Requirements.
- E. Backboards: Fiberglass, Rectangular shaped.
1. Frame: Brushed aluminum edge, steel mounting.
  2. Markings: Painted.
  3. Provide safety padding for bottom edge of backboard.
  4. Provide mounting kit.
  5. Color: White with gray padding.
  6. Manufacturers:
    - a. Draper Inc: [www.draperinc.com](http://www.draperinc.com).
    - b. Porter Athletic Equipment Company: [www.porterathletic.com](http://www.porterathletic.com).
    - c. Performance Sports Systems: [www.perfsports.com](http://www.perfsports.com).
    - d. Substitutions: See Section 01 60 00 - Product Requirements.
- F. Goals: Steel rim, mounted to backboard, with attached nylon anti-whip net; complete with mounting hardware.
1. Net Attachment Device: Wire ties.
  2. Breakaway mechanism.
  3. Provide safety pad for goal mounting.
  4. Finish: Powder coat orange.
  5. Manufacturers:
    - a. Draper Inc: [www.draperinc.com](http://www.draperinc.com).
    - b. Porter Athletic Equipment Company: [www.porterathletic.com](http://www.porterathletic.com).
    - c. Performance Sports Systems: [www.perfsports.com](http://www.perfsports.com).
    - d. Substitutions: See Section 01 60 00 - Product Requirements.

### 2.03 VOLLEYBALL SYSTEM

- A. Overhead Supported Fold-Up Volleyball System, Type A: One court configuration of suspension system, nets and tensioning mechanism meeting all requirements for FIVB, USA Volleyball, NCAA and NFHS competition requirements.
1. Support Frame: Steel components fabricated into a unitized unit with a 3-1/2" O.D. heavy-wall drop-tube bridged with truss-type webbing of 3/4" x 1-1/2" rectangular tubing to provide superior stability. Top of frames shall be supported by special adjustable hangers (three each frame) to provide for precise plumbing of frame during installation. Support hangers shall be offset 3/4" from centerline of vertical frames to properly weight lock entire system in playing position.



2. Net Height Adjustment: Screw-type height adjustment mechanism to easily adjust the net to men's 7' 11-5/8", women's 7' 4-1/8" and youth's 7'-0" official net heights for competition without loosening the net tension. Height setting indicators shall be visible from the side of each frame.
  3. Operator: 3/4 HP electric wench with wireless control system.
  4. Suspension System Color: White.
  5. Product:
    - a. Model 91910100 - Powr-Net Overhead Supported Fold-Up Volleyball System by Porter Athletic : [www.porterathletic.com](http://www.porterathletic.com).
    - b. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Overhead Supported Fold-Up Volleyball System, Type B: Three court configuration of suspension system, nets and tensioning mechanism meeting all requirements for FIVB, USA Volleyball, NCAA and NFHS competition requirements.
1. Support Frame: Steel components fabricated into a unitized unit with a 3-1/2" O.D. heavy-wall drop-tube bridged with truss-type webbing of 3/4" x 1-1/2" rectangular tubing to provide superior stability. Top of frames shall be supported by special adjustable hangers (three each frame) to provide for precise plumbing of frame during installation. Support hangers shall be offset 3/4" from centerline of vertical frames to properly weight lock entire system in playing position.
  2. Net Height Adjustment: Screw-type height adjustment mechanism to easily adjust the net to men's 7' 11-5/8", women's 7' 4-1/8" and youth's 7'-0" official net heights for competition without loosening the net tension. Height setting indicators shall be visible from the side of each frame.
  3. Operator: 3/4 HP electric wench with wireless control system.
  4. System Color: White.
  5. Product:
    - a. Model 91910300 - Powr-Net Triple Court Overhead Supported Fold-Up Volleyball System by Porter Athletic Equipment Company: [www.porterathletic.com](http://www.porterathletic.com).
    - b. Substitutions: See Section 01 60 00 - Product Requirements.

## 2.04 WALL PADDING

- A. Wall Padding: Foam filling bonded to backing board, wrapped in covering; each panel fabricated in one piece.
1. Surface Burning Characteristics: Flame spread of 25 or less, smoke development of 450 or less, when tested in accordance with ASTM E84 as a complete panel.
  2. Flammability: Comply with NFPA 286.
  3. Covering: Vinyl-coated polyester fabric, mildew and rot resistant; stapled to back of board.
    - a. Color: Maroon.
    - b. Texture: Embossed leather-look.
    - c. Fabric Weight: 14 oz/sq yd.
  4. Foam: Urethane, firm, 6 pcf nominal density.
  5. Foam: Open cell polychloroprene (Neoprene) 5.5 pcf nominal density.
  6. Foam Thickness: 2 inches.
  7. Backing Board: Plywood.
    - a. Thickness: 3/8 inch.
    - b. Surface Burning Characteristics: Flame spread of 25 or less, smoke development of 450 or less, when tested in accordance with ASTM E84.
  8. Panel Dimensions: 24 inches wide by 72 inches long, including nailing margins.
  9. Mounting: Removable; Z-clips fixed to wall and to padding.
  10. Manufacturers:
    - a. Draper, Inc: [www.draperinc.com](http://www.draperinc.com).
    - b. Porter Athletic Equipment Company: [www.porter-ath.com](http://www.porter-ath.com).
    - c. Performance Sports Systems: [www.perfsports.com](http://www.perfsports.com).
    - d. Substitutions: See Section 01 60 00 - Product Requirements.

**2.05 SCOREBOARDS**

- A. Single Sided Basketball Scoreboard: Aluminum cabinet, solid state electronics, LED display; integrated horn.
  - 1. Type: Suitable for scoring basketball, tennis, volleyball, and wrestling.
  - 2. Size: 96 inches wide x 48 inches high x 6 inches deep.
  - 3. Cabinet Color: White with black trim.
  - 4. Control: Wireless remote operating console.
  - 5. Digit Technology: PanaView (wide viewing angle).
  - 6. Product:
    - a. Model BB-2101 scoreboard with All Sport 5000 Control Console by Daktronics: [www.daktronics.com](http://www.daktronics.com).
    - b. Substitutions: See Section 01 60 00 - Product Requirements.

**PART 3 EXECUTION****3.01 EXAMINATION**

- A. Take field measurements to ensure proper fitting of work. If taking field measurements before fabrication will delay work, allow for adjustments within recommended tolerances.
- B. Inspect areas and conditions before installation. Notify Architect in writing of unsatisfactory or detrimental conditions. Do not proceed until conditions have been corrected. Commencing installation constitutes acceptance of work site conditions.
- C. Verify that electrical services are correctly located and of the proper characteristics.

**3.02 INSTALLATION**

- A. Install in accordance with contract documents and manufacturer's instructions.
- B. Install equipment rigid, straight, plumb, and level.
- C. Secure all equipment with manufacturer's recommended anchoring devices.
- D. Install wall padding securely, with edges tight to wall and without wrinkles in fabric covering.
- E. Separate dissimilar metals to prevent electrolytic corrosion.

**3.03 ADJUSTING**

- A. Verify proper placement of equipment.
- B. Verify proper placement of equipment anchors and sleeves. Use actual movable equipment to be anchored if available.
- C. Adjust operating equipment for proper operation; remove and replace equipment causing noise or vibration. Lubricate equipment if recommended by manufacturer.

**3.04 CLEANING**

- A. Remove masking or protective covering from finished surfaces.
- B. Clean equipment in accordance with manufacturer's recommendations.

**3.05 PROTECTION**

- A. Protect installed products until Substantial Completion.
- B. Replace damaged products before Substantial Completion.

**END OF SECTION**

## WINDOW SHADES

### PART 1 GENERAL

#### 1.01 SECTION INCLUDES

- A. Window shades and accessories.
- B. Electric motor operators.
- C. Motor controls.

#### 1.02 RELATED REQUIREMENTS

- A. Section 09 21 16 - Gypsum Board Assemblies: Substrate, blocking and backing for window shade systems.
- B. Section 26 05 00 - Common Work Results for Electrical: Electrical connections.

#### 1.03 REFERENCE STANDARDS

- A. ASTM D4674 - Standard Practice for Accelerated Testing for Color Stability of Plastics Exposed to Indoor Office Environments; 2002a (Reapproved 2010).
- B. ASTM G21 - Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi; 2013.
- C. NFPA 701 - Standard Methods of Fire Tests for Flame Propagation of Textiles and Films; 2010.
- D. UL 325 - Standard for Door, Drapery, Gate, Louver, and Window Operators and Systems; Current Edition, Including All Revisions.

#### 1.04 ADMINISTRATIVE REQUIREMENTS

- A. Coordination:
  - 1. Where motorized shades are to be controlled by control systems provided under other sections, coordinate the work with other trades to provide compatible products.
  - 2. Coordinate the work with other trades to provide rough-in of electrical wiring as required for installation of hardwired motorized shades.
- B. Preinstallation Meeting: Convene one week prior to commencing work related to products of this section; require attendance of all affected installers.
- C. Sequencing:
  - 1. Do not fabricate shades until field dimensions for each opening have been taken.
  - 2. Do not install shades until final surface finishes and painting are complete.

#### 1.05 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide manufacturer's standard catalog pages and data sheets including materials, finishes, fabrication details, dimensions, profiles, mounting requirements, and accessories.
  - 1. Motorized Shades: Include power requirements and standard wiring diagrams.
- C. Shop Drawings: Include shade schedule indicating size, location and keys to details.
- D. Shop Drawings - Motorized Shades: Provide schematic system riser diagram indicating component interconnections. Include requirements for interface with other systems.
- E. Verification Samples: Minimum size 6 inches square, representing actual materials, color and pattern.
- F. Manufacturer's Instructions: Include instructions for storage, handling, protection, examination, preparation, and installation of product.

- G. Operation and Maintenance Data: List of all components with part numbers, sources of supply, and operation and maintenance instructions; include copy of shop drawings.
- H. Warranty: Submit sample of manufacturer's warranty and documentation of final executed warranty completed in Owner's name and registered with manufacturer.

#### **1.06 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than five years of experience.
- B. Installer Qualifications: Company specializing in performing work of this type with minimum three years of documented experience.
  - 1. Factory training and demonstrated experience.

#### **1.07 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver shades in manufacturer's unopened packaging, labeled to identify each shade for each opening.
- B. Handle and store shades in accordance with manufacturer's recommendations.

#### **1.08 FIELD CONDITIONS**

- A. Do not install products under environmental conditions outside manufacturer's absolute limits.

#### **1.09 WARRANTY**

- A. See Section 01 78 00 - Closeout Requirements, for additional warranty requirements.
- B. Provide manufacturer's warranty from the Date of Substantial Completion, covering the following:
  - 1. Manufacturer's standard 8 year warranty.

### **PART 2 PRODUCTS**

#### **2.01 MANUFACTURERS**

- A. Motorized Roller Shades, Motors and Motor Controls:
  - 1. Basis of Design:
    - a. Lutron Electronics Co., Inc; Sivoia QS Roller 300 LIFT Shades: [www.lutron.com](http://www.lutron.com).
  - 2. Other Approved Manufacturers:
    - a. Draper, Inc: [www.draperinc.com](http://www.draperinc.com).
    - b. MechoShade Systems, Inc: [www.mechoshade.com](http://www.mechoshade.com).
    - c. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Source Limitations: Furnish products produced by a single manufacturer and obtained from a single supplier.

#### **2.02 ROLLER SHADES**

- A. Roller Shades: Fabric roller shades complete with mounting brackets, roller tubes, hembars, hardware and accessories; fully factory-assembled.
  - 1. Drop: Regular roll.
  - 2. Size: As indicated on drawings.
- B. Fabric: Non-flammable, color-fast, impervious to heat and moisture, and able to retain its shape under normal operation; PVC-free.
  - 1. Sheer Shades: Reduce glare yet still reveal considerable details to the outside; no privacy; Openness Factor greater than 1 percent.
    - a. Commons Exterior Windows: Lutron Electronics Co, Sheer Dual-sided, Phifer, Basketweave 27-Oyster Pewter, 5 percent open.
    - b. Forum/Classrooms Exterior Windows: Lutron Electronics Co, Sheer Dual-sided, Phifer, Basketweave 27-Oyster Pewter, 3 percent open.
  - 2. Blackout Shades: Block virtually all the light; Openness Factor equal to zero (0).

- a. Interior Relites: Lutron Electronics Co, The Classico Collection, Dual-sided, Avila, Khaki BA-0015-0.
  - 3. Flammability: Pass NFPA 701 large and small tests.
  - 4. Anti-Microbial: No growth, tested to ASTM G21 for ATCC9642, ATCC9348, and ATCC9645.
- C. Roller Tube: As required for type of operation, extruded aluminum with end caps.
- 1. Dimensions: Manufacturer's standard, selected for suitability for installation conditions, span, and weight of shades.
  - 2. Fabric Attachment: Utilize extruded channel in tube to accept vinyl spline welded to fabric edge.
- D. Hembars and Hembar Pockets: Wall thickness designed for weight requirements and adaptation to uneven surfaces, to maintain bottom of shade straight and flat.
- 1. Style: Half Wrap fabric covered bottom bar, flat profile with closed ends.
  - 2. Finish: Baked enamel.
  - 3. Color: As selected from manufacturer's standard colors.
- E. Motor Operation: Motor system housed inside roller tube, controlling shade movement via motor controls indicated; listed to UL 325.
- 1. Audible Noise: Maximum 39 dBA measured 3 feet from the motor unit; no audible clicks when motor starts and stops.
  - 2. Motors: Size and configuration as recommended by manufacturer for the type, size, and arrangement of shades to be operated; integrated into shade operating components and concealed from view.
  - 3. Coupling of Multiple Shades: Where possible, minimize number of motors by coupling adjacent shades.
  - 4. Control Compatibility: Fully compatible with the controls to be installed.

### 2.03 MOTOR CONTROLS

- A. Motorized shades to be controlled by wall-mounted controls as specified below.
- B. Power Unit: 220-240 Volt type to supply 24 Volt power to shades, drive units, keypads, and accessories.
- 1. Cover: White finish is exposed; black finish in Band Choral and Drama.
  - 2. Basis of Design: Lutron Electronics, Inc; Sivoia QS 230V Smart Panel power supply: [www.lutron.com](http://www.lutron.com).
- C. Control Requirements:
- 1. Unless specifically indicated to be excluded, provide all required equipment, conduit, boxes, wiring, connectors, hardware, supports, accessories, software, system programming, etc. as necessary for a complete operating system that provides the control intent indicated.
  - 2. Capable of synchronizing multiple units of the same size to start, stop and move in unison.
  - 3. Provide all components and connections necessary to interface with other systems as indicated.
- D. Wall-Mounted Controls: UV stabilized visible parts meeting ASTM D4674; furnished with backlit buttons; provided by shade manufacturer.
- 1. Control Functions:
    - a. Key Locked Function: Provide key switch operation as indicated on Drawings. Basis of Design: Lutron QS Keyswitch.
    - b. Open: Automatically open controlled shade(s) to fully open position when button is pressed.
    - c. Close: Automatically close controlled shade(s) to fully closed position when button is pressed.
    - d. Raise: Raise controlled shade(s) only while button is pressed.
    - e. Lower: Lower controlled shade(s) only while button is pressed.
    - f. Stop shade(s) in motion by tap on any button.
  - 2. Finish: To be selected by Architect.
  - 3. Button Engraving: Manufacturer's standard engraving, unless otherwise indicated.
  - 4. Basis of Design: Lutron Electronics, Inc; see Touch QS : [www.lutron.com](http://www.lutron.com).

**2.04 ACCESSORIES**

- A. Fascias: Size as required to conceal shade mounting.
  1. Style: As selected by Architect from shade manufacturer's full selection.
  2. Material and Color: To match shade.
- B. Brackets and Mounting Hardware: As recommended by manufacturer for mounting configuration and span indicated.
- C. Shade Pockets: Provide extruded aluminum shade pocket with exposed flush mounted extruded aluminum removable closure panel to provide access to shades.
- D. Fasteners: Non-corrosive, and as recommended by shade manufacturer.

**2.05 FABRICATION**

- A. Fabricate shades to fit openings within specified tolerances.
  1. Vertical Dimensions: Fill openings from head to sill with 1/2 inch space between bottom bar and window stool.
  2. Horizontal Dimensions - Inside Mounting: Fill openings from jamb to jamb.
- B. Dimensional Tolerances: As recommended in writing by manufacturer.
- C. At openings requiring continuous multiple shade units with separate rollers, locate roller joints at window mullion centers; butt rollers end-to-end.

**PART 3 EXECUTION****3.01 EXAMINATION**

- A. Examine finished openings for deficiencies that may preclude satisfactory installation.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
- C. Start of installation shall be considered acceptance of substrates.

**3.02 PREPARATION**

- A. Prepare surfaces using methods recommended by manufacturer for achieving best result for substrate under the project conditions.
- B. Coordinate with window installation and placement of concealed blocking to support shades.

**3.03 INSTALLATION**

- A. Install in accordance with manufacturer's instructions and approved shop drawings, using mounting devices as indicated.
- B. Installation Tolerances:
  1. Inside Mounting: Maximum space between shade and jamb when closed of 1/16 inch.
  2. Maximum Offset From Level: 1/16 inch.
- C. Replace blinds that exceed specified dimensional tolerances at no extra cost to Owner.
- D. Adjust level, projection and shade centering from mounting bracket. Verify there is no telescoping of shade fabric. Ensure shades for smooth operation.

**3.04 SYSTEM STARTUP**

- A. Motorized Shade System: Provide services of a manufacturer's authorized representative to perform system startup.

**3.05 CLEANING**

- A. Clean soiled shades and exposed components as recommended by manufacturer.

- B. Replace shades that cannot be cleaned to "like new" condition.

**3.06 CLOSEOUT ACTIVITIES**

- A. See Section 01 78 00 - Closeout Submittals, for closeout submittals.
- B. Demonstration: Demonstrate operation and maintenance of window shade system to Owner's personnel.
- C. Training: Train Owner's personnel on operation and maintenance of system.
  - 1. Use operation and maintenance manual as training reference, supplemented with additional training materials as required.
  - 2. Provide minimum of two hours training by manufacturer's authorized personnel at location designated by the Owner.

**3.07 PROTECTION**

- A. Protect installed installed products from subsequent construction operations.
- B. Touch-up, repair or replace damaged products before Substantial Completion.

**3.08 SCHEDULE**

- A. Sheer Shades, Motorized: Exterior windows at Forum 123, Commons 181, Gymnasium 165, Gymnasium 166, and all first floor Classrooms.
- B. Black-Out Shades, Motorized: Choral 186, Drama/Platform 184 clerestory windows.
- C. Black-Out Shades, Motorized: Interior relites at all Classrooms and Media Center 202.
- D. Sheer Shades, Motorized: Exterior windows at Band 188.

**END OF SECTION**

**PERFORMING ARTS CASEWORK****PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Wood casework for instrument storage.

**1.02 RELATED REQUIREMENTS**

- A. Section 06 41 00 - Architectural Wood Casework: Custom casework.

**1.03 REFERENCE STANDARDS**

- A. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards; 2009.
- B. NEMA LD 3 - High-Pressure Decorative Laminates; National Electrical Manufacturers Association; 2005.

**1.04 ADMINISTRATIVE REQUIREMENTS**

- A. Large Components: Ensure that large components can be moved into final position without damage to other construction.

**1.05 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Component dimensions, configurations, construction details, joint details, attachments; manufacturer's catalog literature on hardware, accessories.
- C. Shop Drawings: Casework locations, large scale plans, elevations, cross sections, rough-in and anchor placement dimensions and tolerances, and clearances required.
- D. Manufacturer's Installation Instructions.

**1.06 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years of documented experience.

**PART 2 PRODUCTS****2.01 INSTRUMENT STORAGE CASEWORK**

- A. Layout: Preliminary layout indicated on Drawings. Final layout as approved by Owner.
- B. Capacity: 100 instruments.
- C. Cabinet Box Construction: 3/4 inch industrial grade composite wood, plastic laminate finish; acoustical material facing on back panel; laminate to match Pencil Wood by Formica.
- D. Shelving: Molded polyethylene with ventilation grooves; adjustable where indicated on drawings.
- E. Doors: Metal grille type with 5-knuckle hinges; hasp for user provided padlocks.
- F. Product:
  1. AcoustiCabinets by Wenger Corp: [www.wengercorp.com](http://www.wengercorp.com).
  2. Substitutions: See Section 01 60 00 - Product Requirements.

**PART 3 EXECUTION****3.01 EXAMINATION**

- A. Verify adequacy of support framing and anchors.



**3.02 INSTALLATION**

- A. Perform installation in accordance with manufacturer's instructions.
- B. Use anchoring devices to suit conditions and substrate materials encountered.
- C. Set casework items plumb and square, securely anchored to building structure.
- D. Align cabinets to adjoining components, install filler panels where necessary to close gaps; seal joints between cabinets and countertops and adjacent construction.
- E. Replace units that are damaged, including those that have damaged finishes.

**3.03 ADJUSTING**

- A. Adjust operating parts, including doors, drawers, hardware, and fixtures, to function smoothly.

**3.04 CLEANING**

- A. Clean all components.

**3.05 PROTECTION**

- A. Do not permit finished casework to be exposed to continued construction activity.
- B. Repair damage that occurs prior to Substantial Completion, including finishes, using methods prescribed by manufacturer; replace units that cannot be repaired to like-new condition.

**END OF SECTION**

## ENTRANCE FLOOR MATS

### PART 1 GENERAL

#### 1.01 SECTION INCLUDES

- A. Carpet walk-off mat (WOM).
- B. Fixed and loose lay mats.
- C. Recessed frame.

#### 1.02 RELATED SECTIONS

- A. Section 03 30 00 - Cast-In-place Concrete: Substrate and recess.

#### 1.03 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data indicating properties of mat, component dimensions and recessed frame characteristics.
- C. Shop Drawings: Indicate dimensions and details for recessed frame.
- D. Samples: Submit two samples, 6 x 6 inch in size illustrating pattern, color, finish, edging.
- E. Maintenance Data: Include cleaning instructions, stain removal procedures.

#### 1.04 PROJECT CONDITIONS

- A. Verify that field measurements are as indicated.

### PART 2 PRODUCTS

#### 2.01 MATERIALS

- A. Walk-Off Mat (WOM): Carpet, UV resistant cut polypropylene pile permanently bonded to non-skid rubber backing.
  - 1. Face Weight: 52 oz/sy.
  - 2. Thickness: 1/2 inch.
  - 3. Roll Width: 13.2 foot.
  - 4. Color:
    - a. WOM-1: Taupe.
  - 5. Product:
    - a. Connexus Super Nop 52 by Mats Inc: [www.matsinc.com](http://www.matsinc.com).
    - b. Substitutions: See Section 01 60 00 - Product Requirements.
- B. Recessed Frame: 1/8 inch thick zinc exposed top strip, zinc coated steel concealed bottom strip, 1/2 inch deep, with anchoring features.
- C. Edging: Rubber, beveled edging, for loose laid mats.
- D. Subfloor Filler: White premix latex; type recommended by mat manufacturer.

### PART 3 EXECUTION

#### 3.01 EXAMINATION

- A. Verify that floor opening for mats are ready to receive work.

#### 3.02 PREPARATION

- A. Verify size of floor recess before fabricating mats.
- B. Vacuum clean floor recess.

**3.03 INSTALLATION**

- A. Install in accordance with manufacturer's instructions.
- B. Install mat frames to achieve flush plane with finished floor surface.
- C. Apply subfloor filler at slab recesses to provide uniform and level surface to accept matting.
- D. Install mats in floor recess flush with finish floor after cleaning of finish flooring.
- E. Install loose lay mats at interior side of gymnasium exterior doors.

**3.04 INSTALLATION TOLERANCES**

- A. Maximum Gap Formed at Recessed Frame From Mat Size: 1/8 inch.

**END OF SECTION**

## TELESCOPING BLEACHERS

### PART 1 GENERAL

#### 1.01 SECTION INCLUDES

- A. Telescoping gymnasium bleachers.

#### 1.02 RELATED REQUIREMENTS

- A. Section 05 55 00 - Metal Fabrications: Additional bleacher deck support brackets.
- B. Section 09 64 66 - Wood Athletic Flooring.
- C. Section 26 05 00 - Common Work Results for Electrical: Electrical connections.

#### 1.03 REFERENCE STANDARDS

- A. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design; 2010.
- B. NFPA 102 - Standard for Grandstands, Folding and Telescopic Seating, Tents, and Membrane Structures; National Fire Protection Association; 2011.
- C. PS 1 - Structural Plywood; 2009.
- D. AWS D1.1/D1.1M - Structural Welding Code - Steel; American Welding Society; 2010 w/Errata.
- E. AWS D1.3/D1.3M - Structural Welding Code - Sheet Steel; American Welding Society; 2008 w/Errata.

#### 1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
  - 1. Preparation instructions and recommendations.
  - 2. Storage handling and requirements.
  - 3. Installation methods.
- C. Shop Drawings: Complete layout with dimensions, seat heights, row spacing and rise, aisle widths and locations, points of connection to substrate, assembly dimensions, and material types and finishes.
  - 1. Provide drawings customized to this project.
  - 2. Include Professional Engineer certification.
  - 3. Wiring Diagrams: Show locations of motors, electrical wiring, and rough-in connections.
- D. Selection Samples: For each material for which color selection is required, submit samples, 2 by 2 inches in size, illustrating colors and finishes available.
- E. Operation and Maintenance Data: Manufacturer's operation and maintenance instructions, including annual inspection and maintenance and bi-annual inspection by a Professional Engineer or manufacturer factory service personnel.
- F. Warranty: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

#### 1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years of documented experience.
- B. Installer Qualifications: Manufacturer's installation crew.
- C. Welder Qualifications: Certified by AWS for the process employed.

**1.06 DELIVERY, STORAGE, AND HANDLING**

- A. Store, in original packaging, under cover and elevated above grade.

**1.07 WARRANTY**

- A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.
- B. Correct defective Work within a five year period after Date of Substantial Completion. Replace parts that fail under normal use at no extra charge to Owner.

**PART 2 PRODUCTS****2.01 MANUFACTURERS**

- A. Basis of Design: Closed Deck Telescopic Bleacher by Interkal LLC: [www.interkal.com](http://www.interkal.com).
- B. Approved other manufacturers:
  1. Interkal LLC: [www.interkal.com](http://www.interkal.com).
  2. Irwin Telescopic Seating Company: [www.irwintelescopicseating.com](http://www.irwintelescopicseating.com).
  3. Hussey Seating Company: [www.husseyseating.com](http://www.husseyseating.com).
  4. Performance Sports Systems: [www.perfsports.com](http://www.perfsports.com).
  5. Substitutions: See Section 01 60 00 - Product Requirements.

**2.02 TELESCOPING BLEACHERS**

- A. Telescoping Bleachers: Factory assembled tiered benches that retract horizontally into depth approximately the same as a single row depth, with fixed seats mounted on leading edge of platforms.
  1. Provide a design certified by a licensed Professional Engineer.
  2. Provide a design that has been in use for at least 5 years; submit documentation.
  3. Design to comply with applicable requirements of NFPA 102 and requirements of code authorities having jurisdiction; where conflicts between requirements occur, comply with whichever is more stringent.
  4. Design with solid fascia (riser) or seat fronts that conceal interior mechanisms when fully retracted, fitting tightly enough to prevent climbing up face; at front row provide key locked, hinged fascia (skirt) to cover gap between seat riser/fascia and floor.
  5. Standard Extension: Top row fixed to floor, adjacent to wall, forward extension (away from wall); attachment to wall acceptable.
  6. Wheelchair Spaces: Allow portions of first row, as indicated, to be manually retracted without affecting other rows; provide removable railings at row two behind wheelchair spaces in compliance with ADA Standards.
  7. Operation: Motor operated.
- B. Design Loads: Design to withstand the following loading conditions:
  1. Live Load on Structural Supports: 100 psf, minimum, of gross horizontal projection.
  2. Live Load on Seats and Walking Surfaces: 120 pounds per linear foot.
  3. Lateral Sway Stress on Structural Supports: 24 pounds per linear foot of seat plank.
  4. Perpendicular Sway Stress on Structural Supports: 10 pounds per linear foot of seat plank.
  5. Concentrated Load: 300 pounds.
- C. Dimensions:
  1. See Contract Drawings for overall dimensions.
  2. Rows: 8.
  3. Rise Per Row: 10.25 inches.
  4. Row Depth: 24 inches.
  5. Seat Height Above Tread: 6 inches.
- D. Structural Supports: Steel or aluminum; manufacturer's standard wheeled carriages supporting each tier separately, with moving parts permanently lubricated and metal parts cushioned to prevent metal-to-metal contact during operation.

1. Design so that each row carriage so that it will individually support the design loads and is self supporting when fully assembled without dependence on platform panels or boards, seats, or fascia.
  2. Welding: In accordance with AWS D1.1/D1.1M and AWS D1.3/D1.3M.
  3. Bolting: Use lock-washers or locknuts.
  4. Wheels: Minimum 3-1/2 inch diameter by 1-1/8 inch wide, with non-marring rubber tires; ball, roller, or oil-impregnated metal bearings; minimum of 2 wheels at each floor support.
  5. Finish: Manufacturer's standard enamel or powder coating.
  6. Row Locking: Automatically mechanically lock each carriage to adjacent carriages when fully extended.
  7. Unlocking : Automatically unlock all rows before engaging retraction mechanism.
- E. Motor Operation: Manufacturer's standard drive mechanism, using motor adequately sized for the purpose.
1. All electrical components and wiring UL listed.
  2. Controls: Start, Stop, Forward, and Reverse in a single control unit.
  3. Control Station: Removable plug-in low-voltage pendant station, with first-row plug-in location for each motor.
  4. Limit Switches: Automatically stop operation when unit has reached fully open or fully closed position.
  5. Provide all wiring internal to bleacher units, to junction box located where indicated; ensure that wiring is not energized except during operation.
  6. Electrical Characteristics: 208/230V, 5 wire, 3-phase, 60 Hz.
  7. Provide access to motor from front side of bleachers; a hinged front skirt or hinged section at least 30 inches wide is acceptable.

### 2.03 SEAT AND PLATFORM COMPONENTS

- A. Seat/Fascia Assembly: Continuous, molded UV-stabilized high-density polyethylene plastic, seat minimum 1 inch thick, textured finish, homogeneous color throughout, color as selected from manufacturer's standard selection; approximately 18 inch long sections independently removable with tongue-and-groove or rabbeted interlock at end joints; 10 inch depth.
1. Shape: Ergonomically contoured, with internal ribs spaced for natural flexibility; rear edge cantilevered to provide toe room of not less than 3 inches; no openings to trap debris.
  2. Provide end caps of same material and finish on each exposed end.
  3. Supports: Internal steel reinforcement of each seat segment bolted to platform nose member; minimum two bolts per segment.
- B. Platform, Tread, and Step Structure: Plywood continuously supported on front and rear with side joints tongue-and-grooved.
1. Plywood: PS 1, 5-ply southern pine or polyethylene-overlaid Douglas fir or southern pine, Grade A-C.
  2. Plywood Thickness: 5/8 inch., minimum.
  3. Front (Nose), Rear, and Intermediate Supports: Steel channel or tube, hot-dipped galvanized.
  4. Provide end caps of same material and finish on each exposed end.
  5. Finish: High gloss clear urethane, both sides, unless polyethylene finished.
  6. Nosings: Formed steel,, minimum, G60/Z275 hot-dipped galvanized.

### 2.04 WHEELCHAIR SEATING

- A. Notchouts. Provide manufacturer's standard permanent handicap notchouts (3'-0 1/4" wide) located as indicated on Drawings. Locate notchouts at section joints only to avoid interference with understructure. Provide fascia panels to match. Notchouts to be 1 row deep.
- B. Recoverable Notchouts. Provide manufacturer's standard recoverable handicap notchouts (3'-0 1/4" wide) located as indicated on Drawings. Notchouts to be 1 row deep. To accommodate operating notchout from either mode by activating a single pull rod located in the front kickboard. The locking linkage to engage a continuous locking angle and lock the notchout in either

recovered or handicap mode. Recoverable seating utilizing cables or any requirement for tools to change modes is not acceptable.

## **2.05 HANDRAILS AND RAILINGS**

- A. Provide the following railings:
  - 1. End of Row Guardrails: Removable, at open ends of sections beginning at row 3. (See Alternate for self-storing rails below)
  - 2. Height: 42 inches above adjacent platform or tread.
  - 3. Removable Railings: Provide steel post sockets attached to platform supports.
- B. Design handrails and railings to withstand the following loads:
  - 1. Concentrated Load on Guardrails: 200 pounds in any direction along top rail.
  - 2. Live Load on Guardrails:
    - a. Horizontal: 50 pounds per linear foot, applied at the guardrail height.
    - b. Vertical: 100 pounds per linear foot, applied vertically to top of guardrail.
- C. Railing Construction: Round steel or aluminum pipe or tube, with formed elbows at corners and caps at ends of straight runs.
  - 1. Aluminum: 1.66 inches minimum outside diameter; natural anodized finish.
  - 2. Steel: 1-1/2 inch minimum outside diameter, with 11 gage, 0.12 inch minimum wall thickness; textured powder coat epoxy finish.

## **2.06 ACCESSORIES**

- A. Fillers and Closures:
  - 1. Ends of Retracted Units: Vinyl curtain.
  - 2. Top Row: Provide seat level rear filler panels to close openings between top row seat and wall; finish to match platforms.
- B. Scorer's Table: 8 feet wide by 15 inches deep,; relocatable to any row of any section without mounting brackets.
- C. Fasteners: Provide hardware and fasteners in accordance with manufacturer's recommendations.
- D. Anchorage: As indicated on drawings; provide hardware in accordance with manufacturer's recommendations.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Verify that field measurements are consistent with those on the shop drawings.
- B. Verify that electrical rough-ins have been installed and are accessible.
- C. Do not begin installation until substrates have been properly prepared and area has been cleared of obstructions.
- D. 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 instructions.
- B. Do not field cut or alter seats, fascia, or structural members without approval.

- C. Provide manufacturer's field representative to inspect completed installation.

**3.04 ADJUSTING**

- A. Lubricate, test, and adjust each moving assembly to ensure proper operation in compliance with manufacturer's recommendations.

**3.05 CLEANING**

- A. Clean exposed and semi-exposed assembly surfaces.
- B. Touch up finishes on damaged or soiled areas.

**3.06 CLOSEOUT ACTIVITIES**

- A. Demonstration and Training: Provide manufacturer's field representative to demonstrate to and train Owner's operating personnel in proper operation of equipment.
  - 1. Location: On site using installed equipment.
  - 2. Time: As agreed between Owner and Contractor.

**3.07 PROTECTION**

- A. Protect installed products until completion of project.
- B. Touch-up, repair, or replace damaged products before Substantial Completion.

**END OF SECTION**



**SECTION 12 93 00**  
**SITE FURNISHINGS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Benches.
- B. Trash and Recycling Receptacles.
- C. Bollards.
- D. Bike/Skate Deterrent

**1.02 RELATED REQUIREMENTS**

- A. Section 03 30 00 - Cast-in-Place Concrete:
- B. Section 05 50 00 - Metal Fabrications: Custom metal outdoor furnishings.

**1.03 REFERENCE STANDARDS**

- A. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2008.
- B. ASTM A269 - Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service; 2008.
- C. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes; 2010.
- D. ASTM A615/A615M - Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement; 2009b.
- E. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2003.
- F. ASTM C33 - Standard Specification for Concrete Aggregates; 2008.

**1.04 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
  - 1. Preparation instructions and recommendations.
  - 2. Storage and handling requirements and recommendations.
  - 3. Installation methods and details.
  - 4. Maintenance and cleaning recommendations.
  - 5. Warranty information.
- C. Shop Drawings: Indicate size, shape, and dimensions, including clearances from adjacent obstructions.
- D. Selection Samples: For each finish product specified, submit color chips for review and approval.

**1.05 COORDINATION**

- A. Coordinate with other trades affecting and affected by work of this Section.

**1.06 DELIVERY, STORAGE, AND HANDLING**

- A. Store products in manufacturer's unopened packaging with legible manufacturer's identification until ready for installation.
- B. Use all means necessary to protect materials of this Section before, during and after installation and to protect installed work and materials of other trades.
- C. In event of damage, immediately make all repairs and replacements necessary to approval of Owner's Representative.

- D. Store and handle materials in accordance with manufacturer's recommendations.

**PART 2 PRODUCTS**

**2.01 BENCH**

- A. Steel Bench: Install per manufacturer's recommendations.
  - 1. Material/Size: Solid steel rod and tubular steel, 6 foot length.
  - 2. Make/Model: Victor Stanley Model FS-53, Streetsites Collection, or approved.
  - 3. Finish: Metal components powder coated silver from manufacturer's standard finishes.
  - 4. Mounting: Surface mounted.
- B. Substitutions: Refer to Section 01 60 00 - Product Requirements.

**2.02 TRASH AND RECYCLING RECEPTACLE**

- A. Steel Receptacles: Install per manufacturer's recommendation.
  - 1. Material/Size: Recycled solid steel bar, 36-gal.
  - 2. Make/Model: Victor Stanley Model T-32, Streetsites Collection, or approved.
  - 3. Lid: Domed Lid
  - 4. Finish: Powder coated silver from manufacturer's standard finishes.
- B. Substitutions: Refer to Section 01 60 00 - Product Requirements.

**2.03 BUILDING PROTECTION BOLLARD**

- A. Steel Mechanical Square Tublar Steel Bollard.
  - 1. Make/Model: CBSQ-44-E-P-D by Creative Pipe, Inc. Rancho Mirage, CA, Tel. (800) 644-8467, or approved.
  - 2. Height: 36-inches
  - 3. Finish: Powder coat silver
  - 4. Mounting: Embedded 24-inches
  - 5. Cap: Domed Top Cap
- B. Substitutions: Refer to Section 01 60 00 - Product Requirements.

**2.04 REMOVABLE BOLLARD**

- A. Powder coated steel pipe bollard with cap and ground sleeve to allow for removing.
  - 1. Make/Model: CBSQ-44-RE-P-D by Creative Pipe, Inc. Rancho Mirage, CA, Tel. (800) 644-8467, or approved.
  - 2. Height: 36-inches
  - 3. Finish: Powder coat silver
  - 4. Mounting: Removable Embedded, Pad lockable.
  - 5. Cap: Domed Steel Top Cap
  - 6. Accessories: Pad lockable hole cover
- B. Substitutions: See Section 01 60 00 - Product Requirements.

**2.05 BIKE/SKATE DETERRENT**

- A. Material: 6061-T6 Aluminum
  - 1. Make/Model: FR 012-SS by Skatestoppers, El Cajon, CA (619) 447-6374, or approved.
  - 2. Finish: Type II Clear Anodize
  - 3. Mounting: Follow Manufacturer's recommendations.
- B. Substitutions: See Section 01 60 00 - Product Requirements.

**PART 3 EXECUTION**

**3.01 EXAMINATION**

- A. Verify that mounting surfaces, preinstalled anchor bolts, or other mounting devices are properly installed; and ready to receive site furnishing items.
- B. Do not begin installation until unsatisfactory substrates have been properly repaired.

**3.02 PREPARATION**

- A. Ensure surfaces to receive site furnishings are clean, flat, and level.
- B. Notify Owner's Representative for approval of Site Furnishing location prior to installation.

**3.03 INSTALLATION**

- A. Install in accordance with manufacturer's instructions.
- B. Install furnishings level, plumb, square, and correctly located as indicated on the drawings.
- C. Layout site furnishings for Owner's Representative to review location prior to installation.

**3.04 CLEANING**

- A. Clean installed work to like-new condition. Do not use cleaning materials or methods that could damage finish.

**3.05 PROTECTION**

- A. Protect installed products until completion of project.
- B. Touch-up, repair or replace damaged products before Substantial Completion.

**END OF SECTION**

## PASSENGER ELEVATORS

### PART 1 GENERAL

#### 1.01 SECTION INCLUDES

- A. Complete elevator systems.
  - 1. Public Elevators, 2,500 lbs. capacity.
- B. Elevator maintenance.

#### 1.02 RELATED REQUIREMENTS

- A. Section 03 30 00 - Cast-in-Place Concrete: Elevator machine foundation and pit.
- B. Section 05 12 00 - Structural Steel Framing: Hoistway framing and overhead hoist beams.
- C. Section 05 50 00 - Metal Fabrications: Pit ladder and Sill supports.
- D. Section 09 21 16 - Gypsum Board Assemblies: Gypsum shaft walls.
- E. Section 09 65 00 - Resilient Flooring: Floor finish in cab.
- F. Section 26 05 00 - Common Work Results for Electrical: Electrical connections.
- G. Section 28 30 00 - Fire Detection and Alarm.

#### 1.03 REFERENCE STANDARDS

- A. AISC 360 - Specification for Structural Steel Buildings; American Institute of Steel Construction, Inc.; 2010.
- B. NFPA 70 - National Electrical Code; National fire Protection Association; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- C. NFPA 80 - Standard for Fire Doors and Other Opening Protectives; 2013.
- D. UL (BMD) - Building Materials Directory; Underwriters Laboratories Inc.; current edition.
- E. UL (ECMD) - Electrical Construction Materials Directory; Underwriters Laboratories Inc.; current edition.

#### 1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Indicate the following information:
  - 1. Locations of machine room equipment: driving machines, controllers, governors and other component.
  - 2. Hoistway components: Car, counterweight, sheaves, machine and sheave beams, guide rails, buffers, ropes, 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 and location of trolley beams.
  - 6. Clearances and over-travel of car and counterweight.
  - 7. Locations in hoistway and machine room of traveling cables and connections for car light.
  - 8. Location and sizes of access doors, doors, and frames.
  - 9. Expected heat dissipation of elevator equipment in machine room.
  - 10. Applicable seismic design data; certified by a licensed Professional Structural Engineer.
  - 11. Interface with building security system.
  - 12. Electrical characteristics and connection requirements.
  - 13. Show arrangement of equipment in machine room so rotating elements, sheaves, and other equipment can be removed for repairs or replaced without disturbing other components. Arrange equipment for clear passage through access door.

- 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.
- D. Maintenance Contract.
- E. Maintenance Data: Include:
  1. Technical information for servicing operating equipment.
  2. 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 machine room and hoistway apparatus.

### **1.05 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 Oregon.
- C. Perform structural steel design, fabrication, and installation in accordance with AISC 360, Specification for Structural Steel Buildings. Perform seismic design in accordance with applicable code.
- D. Fabricate and install door and frame assemblies in accordance with NFPA 80.
- E. Perform electrical work in accordance with NFPA 70.
- F. Installer Qualifications: Company specializing in performing the work of this section and approved by elevator equipment manufacturer.
- G. Products Requiring Fire Resistance Rating: Listed and classified by UL.
- H. Products Requiring Electrical Connection: Listed and classified by Underwriters Laboratories Inc. as suitable for the purpose specified and indicated.

### **1.06 PRE-INSTALLATION MEETING**

- A. Review schedule of installation, installation procedures and conditions, and coordination with related work.
- B. Review use of elevator for construction purposes, hours of use, scheduling of its use, cleanliness of cab, employment of operator, maintenance of system.

### **1.07 PROJECT CONDITIONS**

- A. Construction Use of Elevator: Enclose elevator when required for transport of construction personnel and materials.
  1. Enclose cab with protective plywood on floor, walls, and ceiling.
  2. Provide temporary lighting.
  3. Provide control panel with manual and emergency operation with key operation for attendant operator.

### **1.08 WARRANTY**

- A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.

## **PART 2 PRODUCTS**

### **2.01 MANUFACTURERS**

- A. Endura 2500 Twinpost Above-Ground 2-Stage Elevator by ThyssenKrupp Elevator Corporation.

- B. Other Acceptable Manufacturers:
  1. Otis Elevator Co: [www.otis.com](http://www.otis.com).
  2. Schindler Elevator Corp: [www.us.schindler.com](http://www.us.schindler.com).
  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 No.1: Passenger, holeless hydraulic type with cylinder in hoistway.
  1. Operation and Controls: Three-stop automatic.
  2. Jack Type: 2-Stage, twinpost.
  3. Additional Service Controls: In addition, provide:
    - a. Independent service.
    - b. Limited access service.
  4. Hoistway Doors and Frames: Stainless steel.
  5. Cab Height: 95 inches.
  6. Ceiling Height: 88 inches.
  7. Hoistway and Cab Entrance Frame Opening Size: 42 x 84 inches.
  8. Door Type: Double leaf.
  9. Door Operation: Center opening.
  10. Rated Net Capacity: 2,500 lbs.
  11. Rated Speed: 110 ft/min.
  12. Clear Net Platform Size: 51 x 80 inches.
  13. Travel Distance: As indicated on drawings.
  14. Number of Stops: 2.
  15. Number of Openings: 2 Front .
  16. Hydraulic Motor and Pump Location: Adjacent to hoistway.
- B. Elevator Cabs:
  1. Front Return Wall Panel: Stainless steel, 16 gage, No. 4 finish.
  2. Control Panel and Face Plate: Stainless steel with illuminating call buttons; ADA compliant.
  3. Indicator Panel: Above control panel with illuminating position indicators.
  4. Side and Rear Walls: Stainless steel faced, fire-retardant treated plywood panels; No. 4 finish.
  5. Railings: Stainless steel tubing, 1-1/2 inch diameter, returned end; No. 4 finish.
  6. Floor Finish: Carpet Tile CPT-1 specified in Section 09 68 13 - Tile Carpeting.
  7. Base: Stainless steel, slotted, No. 4 finish.
  8. Ceiling Finish: Suspended translucent plastic panels with stainless steel frame.
  9. Light Fixtures: LED down-lights.
  10. Ventilation: Two-speed fan, grille in ceiling.
  11. Pad Hooks: Stainless steel, mounted at 72 inches high in cab.
  12. Pads: One set per elevator, canvas cover, padded with cotton wadding fill material, sewn with piping edges; brass grommets spaced to match pad hooks in cab, covering side and rear walls and front return, except cut-out for control panel.
  13. Certificate Frame and Glazing: Stainless steel frame, clear plastic glazing, attached with tamper-proof screws.
  14. Emergency Telephone: Abuse-resistant type with activation button and perforated stainless steel plate to protect internal microphone and speaker; ADA compliant; 14-digit dialing capable.
    - a. Model 2100-957CC Smartphone V by Rath Microtech: [www.rathmicrotech.com](http://www.rathmicrotech.com).
    - b. Substitutions: See Section 01 60 00 - Product Requirements.
- C. Hoistway Entrances:
  1. Hoistway Doors: Stainless steel, 16 gage thick metal; of hollow sandwich panel construction, flush design, rolled profiles, rigid construction; No. 4 finish.
  2. Hoistway Frames: Stainless steel, 16 gage thick metal; provide 2 inch high raised numerals on door frame jamb to identify each floor level, ADA compliant.

- D. Cab Entrances:
  1. Cab Doors: Stainless steel, 16 gage thick metal, of hollow sandwich panel construction, flush design, rolled profiles, rigid construction; fabricate front return panel same as doors; No. 4 finish.
  2. Cab Door Frames: Stainless steel, 16 gage thick metal, or rolled profiles, welded corner design with smooth invisible joints; No. 4 inch.
- E. Sills: Aluminum.
- F. Access Ladder: See Section 05 50 00.

### 2.03 CONTROLS

- A. Cab Control Panel: Provide one flush mounted operating panel per car with applied faceplate; with return panels containing illuminated call buttons corresponding to floors served, in car alarm button, and "DOOR OPEN" and "DOOR CLOSE" buttons; include matching intercom emergency call panel; include matching service cabinet integral with front return, with hinged door and lock in each car containing the following:
  1. Independent service switch.
  2. Inspection switch.
  3. Fan or blower switch.
  4. Light switch.
  5. Emergency light.
- B. 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 photo-electric light rays.
  5. Sound audible tone signal in car when car arrives at a floor.
- C. Landing Buttons: Access controlled by card reader; Stainless steel type, one for originating UP and one for originating DOWN calls, one button only at terminating landings; marked with arrows.
- D. Landing Position Indicators: Illuminating white.
- E. Car Direction Indicators: Illuminating white.
- F. Interconnect elevator control system with building fire alarm systems.
- G. Provide "Firefighter's Operation" in accordance with applicable code. Designated Landing: Level 1.

### 2.04 EMERGENCY POWER

- A. Arrange elevator operation to operate under emergency power when normal power supply fails.
- B. Emergency Power Supply: Self-contained battery power.
- C. Upon transfer to emergency power, advance one elevator at a time to a pre-selected landing, stop car, open doors, disable operating circuits, and hold in standby condition.

### 2.05 ELECTRICAL CHARACTERISTICS AND COMPONENTS

- A. Electrical Characteristics:
  1. 480/277 volts, three phase, 60 Hz.
  2. Motor: NEMA MG1.

**2.06 MACHINE ROOM FITTINGS**

- A. 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.
- B. Key Cabinet: Wall-mounted, lockable, keyed to building keying system, for control/operating panel keys.
  - 1. Provide two extra key cabinet keys.
  - 2. Provide two extra control/operating panel keys.
  - 3. Provide two extra card access keys.

**PART 3 EXECUTION****3.01 EXAMINATION**

- A. Verify existing conditions before starting work.
- B. Verify that hoistway, pit, and machine room 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 is 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 elevator system components and coordinate with installation of hoistway wall construction.
  - 1. Install in accordance with ASME A17.1, manufacturer's instructions and approved shop drawings.
  - 2. Comply with NEC for electrical work required during installation.
- B. Install system components. Connect equipment to building utilities.
- C. Provide conduit, boxes, wiring, and accessories.
- D. Install hydraulic piping between cylinder and pump unit.
- E. Connect to fire-alarm system.
- F. Connect to telephone system for emergency call.
- G. 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.
- H. Accommodate equipment in space indicated.
- I. Install guide rails using threaded bolts with metal shims and lock washers under nuts. Compensate for expansion and contraction movement of guide rails.
- J. Accurately machine and align guide rails. Form smooth joints with machined splice plates.
- K. Bolt brackets to inserts placed in concrete form work that will perform to four times the rated pull-out load.
- L. Field Welds: Chip and clean away oxidation and residue, wire brush; spot prime with two coats.
- M. Coordinate installation of hoistway wall construction.
- N. 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.



- O. Structural Metal Surfaces: Clean surfaces of rust, oil or grease; wipe clean with solvent; prime two coats.
- P. Machine Room Components: Clean and degrease; prime one coat, finish with one coat of enamel.
- Q. 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 .
- B. Cab Movement on Aligned Guide Rails: Smooth movement, with no objectionable lateral or oscillating movement or vibration.

### **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.

### **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 70 00 - Execution Requirements, for additional requirements relating to maintenance service.
- B. Provide a separate maintenance contract for specified maintenance service.
- C. Perform maintenance work using competent and qualified personnel under the supervision and in the direct employ of the elevator manufacturer or original installer.
- D. Maintenance service shall not be assigned or transferred to any agent or subcontractor without prior written consent of Owner.
- E. Provide service and maintenance of elevator system and components for one year from Date of Substantial Completion.
- F. Examine system components monthly. Clean, adjust, and lubricate equipment.
- G. 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. Replace wire ropes when necessary to maintain the required factor of safety.

- H. Perform work without removing cars during peak traffic periods.
- I. Provide emergency call back service during working hours for this maintenance period.

**3.10 CLEANING and PROTECTION**

- A. Remove protective coverings from finished surfaces.
- B. Clean surfaces and components ready for inspection.
- C. Do not permit construction traffic within cab after cleaning.

**END OF SECTION**