PROJECT MANUAL
FOR

ELLIS ELEMENTARY SCHOOL
Logan, Utah

LOGAN CITY SCHOOL DISTRICT
North Logan, Utah

January 21, 2020

VOLUME 1 – Architectural

Architectural Design West, P.C.
Architect
255 South 300 West
Logan, Utah 84321

design west | architects

Darrell W. Anderson Construction
CMGC
76 West 2400 North
Logan, Utah 84341
SECTION 00 0101
PROJECT TITLE PAGE

PROJECT MANUAL

FOR

LOGAN CITY SCHOOL DISTRICT
ELLIS ELEMENTARY SCHOOL

ELLIS ELEMENTARY SCHOOL
348 WEST 300 NORTH
LOGAN, UTAH 84321

DATE: NOVEMBER 11, 2019

PREPARED BY: DESIGN WEST ARCHITECTS
ARCHITECT'S PROJECT NUMBER: 119291

END OF SECTION
PART 1 GENERAL

1.01 SECTION INCLUDES
A. Identification of project team members and their contact information.

1.02 OWNER:
A. Name: Logan City School District.
   1. Address Line 1: 101 West Center Street.
   2. City: Logan.
   5. Telephone: (435) 755-2300.
B. Primary Contact: All correspondence from the Contractor to the Architect will be direct, with copies to this party, unless alternate arrangements are mutually agreed upon at preconstruction meeting.
   1. Title: Facilities Manager.
   2. Name: Don Bell.
   3. Email: don.bell@loganschools.org.

1.03 CONSULTANTS:
A. Architect: Design Professional of Record. All correspondence from the Contractor regarding construction documents authored by Architect's consultants will be through this party, unless alternate arrangements are mutually agreed upon at preconstruction meeting.
   1. Company Name: Design West Architects.
      a. Address Line 1: 255 S 300 W.
      b. City: Logan.
      c. State: Utah.
      e. Telephone: (435) 752-7031.
   2. Primary Contact:
      a. Title: Project Architect.
      b. Name: Stephen Williams.
      c. Email: stephenw@designwestarchitects.com.
B. Civil Engineering Consultant:
   1. Company Name: Cache Landmark.
      a. Address Line 1: 95 Golf Course Rd #101.
      b. City: Logan.
      c. State: Utah.
      e. Telephone: (435) 713-0099.
   2. Primary Contact:
      a. Title: Civil Engineer.
      b. Name: Lance Anderson.
      c. Email: lance@cachelandmark.com.
C. Landscape Architecture Consultant:
   1. Company Name: Design West Architects.
      a. Address Line 1: 255 S 300 West.
      b. City: Logan.
      c. State: Utah.
      e. Telephone: (435) 752-7031.
   2. Primary Contact:
a. Title: Landscape Architect.
b. Name: Dustin Hilsop.
c. Email: dustinh@designwestarchitects.com.

D. Structural Engineering Consultant:
1. Company Name: ARW.
   a. Address Line 1: 1594 w Park Circle #100.
   b. City: Ogden.
   c. State: Utah.
   e. Telephone: 801-782-6008.
2. Primary Contact:
   a. Title: Project Engineer.
   b. Name: Josh Blazzard.
   c. Email: Joshb@arwengineers.com.

E. Mechanical Engineering Consultant:
1. Company Name: VBFA.
   a. Address Line 1: 330 S 300 E.
   b. City: Salt Lake City.
   c. State: Utah.
   e. Telephone: (801) 530-3148.
2. Primary Contact:
   a. Title: Project Engineer.
   b. Name: Jed Jenkins.
   c. Email: jjenkins@VBFA,com.

F. Electrical Engineering Consultant:
1. Company Name: Envision Engineering.
   b. City: Salt Lake City.
   c. State: Utah.
   e. Telephone: (801) 534-1130.
2. Primary Contact:
   a. Title: Project Engineer.
   b. Name: Phillip Borup.
   c. Email: pborup@envisioneng.com.

1.04 CONSTRUCTION MANAGER
A. Company Name: DWA Construction.
   1. Address Line 1: 76 West 2400 North.
   2. City: Logan.
   5. Telephone: (435) 752-6860.

B. Primary Contact:
   1. Title: Project Manager.
   2. Name: Shane Wilde.
   3. Email: shanew@dwaconstruct.com.

PART 2 PRODUCTS - NOT USED
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PROJECT: Ellis Elementary School for Logan City School District located at 348 West 300 North, Logan, UT 84321.

DESCRIPTION: Provide lump sum bids for the demolition of the existing Ellis Elementary School and construction of a new elementary school on the site of the existing Ellis Elementary School in Logan, Utah. This project will begin approximately June 15, 2020 and continue through July 31, 2021. Demolition of the existing Ellis Elementary School will occur during the summer school break of 2020.

TIME AND PLACE: DWA Construction, Inc., CM/GC for the Logan City School District will receive contractor bids for this project at their Corporate Office located at 76 West 2400 North P.O. Box 3448, Logan, Utah 84323 on February 6, 2019 @ 2:00 PM. Faxed or emailed bids will be accepted.

TYPE OF BID: The package will be bid using a low bid best Value selection process.

PRE-BID MEETING: There is no scheduled pre-bid meeting. Questions are to be directed to the Construction Manager, DWA Construction, Inc., at 435-752-6860.

COMPLETION LIQUIDATED LIQUIDATED DAMAGE Liquidated damages will be assessed in the amount of $1,000.00 for each calendar day that the project is delayed based on the project schedule for each trade. Construction will begin approximately June 15, 2020 and be completed by July 31, 2021.

BIDDING DOCUMENTS: Bidding documents will be available January 23, 2020 thru the office of DWA Construction, Inc., 76 West 2400 North P.O. Box 3448, Logan, Utah 84323. Bidders will be limited to one (1) set of documents. These sets WILL NOT be available to keep for the duration of the bidding. No partial sets of documents will be issued. Plans will also be available for viewing at our website www.dwaccontrast.com and the following plan rooms:

1. Mountain Land Plan Room: 583 W 3560 S Suite 4 Salt Lake City Ut 84115 Phone: 801-288-1188 Fax 801-288-1184

2. DWA Construction, Inc.: 76 West 2400 North Logan, Utah 84341 Phone: (435) 752-6860 Fax (435) 752-7606

3. Intermountain Contractor: www.construction.com/projectcenter/

PERFORMANCE AND PAYMENT: Upon receipt of a contract in excess of $150,000.00, the successful Contractor shall furnish to the Owner (at the CM/Owner’s option) a 100 percent Performance and Payment Bond in accordance with the Instructions to Bidders.

BID BONDS Bid Bonds will be required on all bids in excess of $150,000.00.

RIGHT TO REJECT BIDS: DWA Construction, Inc. and the Owner reserves the right to reject any or all bids and to waive any irregularities in any bid or in the bidding.

END OF SECTION
BID FORM
Ellis Elementary School

Bid form must be completed in its entirety for bid to be considered.

Subcontractor/supplier name: __________________________________________

Address: ___________________________________________________________

Contractor's License number: __________________________________________

Phone Number: ___________________ Fax number: _________________________

Email Address: _______________________________________________________  

Name of Contact: ____________________________________________________

BID TO:       DWA Construction, Inc.  
76 West 2400 North - P.O. Box 3448 - Logan, Utah 84323-3448 
Phone: 435-752-6860  Fax: 435-752-7606  
E-mail: dennis@dwaconstruct.com or cliff.p@dwaconstruct.com

PLEASE NOTE that this project is tax exempt – DO NOT include sales tax.  
If you are bidding more than one specification section,  
Please attach additional breakdown information.

Acknowledge addendums: (list each separately)  ___  ___  ___  ___  ___  ___  ___

Bidding Section(s):

_________________________________________________________________

_________________________________________________________________

_________________________________________________________________

Base bid: ($_______________________________)

Written amount: ____________________________________________________ dollars

(In case of discrepancy between the written amount and numeral, written amount will govern)
Alternate 01: Raised Concrete/Fence Median

Sawcut, remove and dispose of existing asphalt and base material in median location. Install base material and install raised concrete median with ornamental fence per detail. Install base material and asphalt road to match road and concrete median per details.

($__________________________)

Written amount: ___________________________________ dollars

(In case of discrepancy between the written amount and numeral, written amount will govern)
ADDITIONAL INFORMATION NEEDED:

Mechanical:
Division 22-23: (Must be a complete bid)
Plumbing Contractor

Cost $__________________________

HVAC Contractor

Cost $__________________________

Controls Contractor

Cost $__________________________

Test & Balance Contractor

Cost $__________________________

Insulation Contractor

Cost $__________________________

Electrical:
Division 26 (Must be a complete bid and include a temporary 400 AMP temporary service)
Electrical Contractor

Cost $__________________________

Fire Alarm System contractor

Cost $__________________________

Intercommunications System contractor

Cost $__________________________

Sound System contractor

Cost $__________________________

Generator Manufacturer

Cost $__________________________

Sound Amplification System contractor

Cost $__________________________

Division 27
Telecommunications cabling system contractor

Cost $__________________________
ADDITIONAL BIDDING REQUIREMENTS:

(Failure to respond where required may result in disqualification of bid)

1. Bids shall be priced lump sum to furnish and / or install all material and / or equipment as required by plans and specifications for a complete installation.

2. The construction duration portion of this project will be 15 months or less. Material and equipment must be delivered and installed in accordance with the Construction Manager’s schedule as updated throughout the project. Liquidated damages are $1000.00 per day. See Advertisement for Bids.

3. COST OF PAYMENT AND PERFORMANCE BOND: $_________________________. Only bids over $150,000.00 will require a performance and payment bond at CM/Owner option. (This amount will be added to the base bid amount, if payment and performance bonds are required. If no amount is provided, it will be presumed that the bidder is unable to bond for its work on this project and may be cause for rejection).

4. The Construction Manager and Owner reserve the right to accept or reject any, and all proposals or alternates with or without cause for any reason determined to be in the owner’s best interest and to waive any bidding informality or irregularity.

5. The undersigned bidder, having examined the Drawings, Specifications and related documents in their entirety, and the site of the proposed work, and being familiar with all of the conditions surrounding the construction of the proposed project including the availability of labor, hereby proposes to complete the work listed above in accordance with the Contract Documents and within the time set forth, at the price stated above and upon the subcontract form included in the Specifications. The above price is to cover all expenses incurred in performing the work required under the Contract Documents.

6. CONTRACTOR’S QUALIFICATION STATEMENT: Upon request the low bidders shall submit AIA Document A305 Contractor’s Qualification Statement. Failure to show a statement satisfactory to the Owner or Construction Manager will be reason to reject the bid as non-responsive. Past performance on similar projects, the demonstrated ability to complete work on schedule and ability to perform the work on this project to the satisfaction of the Owner and Construction Manager will be a priority.

BY ITS SIGNATURE, BIDDER ACKNOWLEDGES THAT THE BID DOCUMENTS ARE A COMPLETE PACKAGE. BIDDER CERTIFIES IT HAS REVIEWED ALL BID DOCUMENTS TO DETERMINE ITS TOTAL SCOPE OF WORK AND HAVE INCLUDED ALL RELATED COSTS.

________________________________________
Name of Bidder

________________________________________
Authorized Signature

________________________________________
Date

________________________________________
Contact phone number

________________________________________
Printed name of authorized signature

________________________________________
Contractor License Number
The person signing this certificate MUST check the applicable box showing the basis for which the exemption is being claimed. Questions should be directed (preferably in writing) to Taxpayer Services, Utah State Tax Commission, 210 N 1950 W, Salt Lake City, UT 84134. Telephone 801-297-2200, or toll free 1-800-662-4335.

Do not send this certificate to the tax commission. Keep it with your records in case of an audit.

☐ United States Government or Native American Tribe
I certify the tangible personal property or services purchased are to be paid directly with funds from the entity noted on this form and will be used in the exercise of essential governmental or tribal functions. NOTE: Includes sales of tangible personal property to federally chartered credit unions. “Directly” does not include per diem, entity advances, or government reimbursements for employee credit card purchases.

☐ Construction Materials Purchased for Schools or Public Transit Districts
I certify the construction materials purchased are on behalf of a public elementary or secondary school, or public transit district. I further certify the purchased construction materials will be installed or converted into real property owned by the school or public transit district.

Name of school or public transit district:

Name of project:

☐ Utah State and Local Governments and Public Elementary and Secondary Schools
Sales Tax License No. 11734913-004-STC
I certify the tangible personal property or services purchased are to be paid directly with funds from the entity noted on this form and will be used in the exercise of that entity’s essential functions. For construction materials, if the purchaser is a Utah state or local government, these construction materials will be installed or converted into real property by employees of this government entity. “Directly” does not include per diem, entity advances, or government reimbursements for employee credit card purchases. CAUTION: This exemption does not apply to government or educational entities of other states.

☐ Heber Valley Historic Railroad
I certify these purchases and sales are by the Heber Valley Historic Railroad Authority or its operators and are related to the operation and maintenance of the Heber Valley Historic Railroad.

☐ Foreign Diplomat
I certify that lodging-related purchases are authorized by a diplomatic tax exemption card issued by the United States.

To be valid this certificate must be filled in completely, including a check mark in the proper box.

A sales tax license number is required only where indicated.

Please sign, date and, if applicable, include your license or exemption number.

NOTE TO SELLER: Keep this certificate on file since it must be available for audit review.

NOTE TO PURCHASER: Keep a copy of this certificate for your records. You must notify the seller of cancellation, modification, or limitation of the exemption you have claimed.

If you need an accommodation under the Americans with Disabilities Act, contact the Tax Commission at (601) 297-3811 or TDD (601) 297-2020. Please allow three working days for a response.
**Request for Taxpayer Identification Number and Certification**

### Part I  Taxpayer Identification Number (TIN)

Enter your TIN in the appropriate box. The TIN provided must match the name given on line 1 to avoid backup withholding. For individuals, this is generally your social security number (SSN). However, for a resident alien, sole proprietor, or disregarded entity, see the Part I instructions on page 3. For other entities, it is your employer identification number (EIN). If you do not have a number, see How to get a TIN on page 3.

Note: If the account is in more than one name, see the instructions for line 1 and the chart on page 4 for guidelines on whose number to enter.

### Part II  Certification

Under penalties of perjury, I certify that:

1. The number shown on this form is my correct taxpayer identification number (or I am waiting for a number to be issued to me); and

2. I am not subject to backup withholding because: (a) I am exempt from backup withholding, or (b) I have not been notified by the Internal Revenue Service (IRS) that I am subject to backup withholding as a result of a failure to report all interest or dividends, or (c) the IRS has notified me that I am no longer subject to backup withholding; and

3. I am a U.S. citizen or other U.S. person (defined below); and

4. The FATCA code(s) entered on this form (if any) indicating that I am exempt from FATCA reporting is correct.

Certification instructions: You must cross out item 2 above if you have been notified by the IRS that you are currently subject to backup withholding because you have failed to report all interest and dividends on your tax return. For real estate transactions, item 2 does not apply. For mortgage interest paid, acquisition or abandonment of secured property, cancellation of debt, contributions to an individual retirement arrangement (IRA), and generally, payments other than interest and dividends, you are not required to sign the certification, but you must provide your correct TIN. See the instructions on page 3.

**General Instructions**

Section references are to the Internal Revenue Code unless otherwise noted.

Future developments, information about developments affecting Form W-9 (such as legislation enacted after we release it) is at www.irs.gov/f9.

**Purpose of Form**

An individual or entity (Form W-9 requester) who is required to file an information return with the IRS must obtain your correct taxpayer identification number (TIN), which may be your social security number (SSN), individual taxpayer identification number (ITIN), adoption taxpayer identification number (ATIN), or employer identification number (EIN), to report on an information return the amount paid to you, or other amount reportable on an information return. Examples of information returns include, but are not limited to, the following:

- **Form 1099-INT** (interest earned or paid)
- **Form 1099-DIV** (dividends, including those from stocks or mutual funds)
- **Form 1099-MISC** (various types of income, prizes, awards, or gross proceeds)
- **Form 1099-B** (stock or mutual fund sales and certain other transactions by brokers)
- **Form 1099-S** (proceeds from real estate transactions)
- **Form 1099-K** (merchant and third party network transactions)
- **Form 1098** (home mortgage interest), 1098-E (student loan interest), 1098-T (tuition)
- **Form 1099-C** (canceled debt)
- **Form 1099-A** (acquisition or abandonment of secured property)

Use Form W-9 only if you are a U.S. person (including a resident alien), to provide your correct TIN.

**Claim exemption from backup withholding**

If you do not return Form W-9 to the requester with a TIN, you might be subject to backup withholding. See What is backup withholding? on page 2.

By signing the filled-out form, you:

1. Certify that the TIN you are giving is correct (or you are waiting for a number to be issued).

2. Certify that you are not subject to backup withholding, or

3. Claim exemption from backup withholding if you are a U.S. exempt payee. If applicable, you are also certifying that as a U.S. person, your allocable share of any partnership income from a U.S. trade or business is not subject to the withholding tax on foreign partners' share of effectively connected income, and

4. Certify that FATCA code(s) entered on this form (if any) indicating that you are exempt from the FATCA reporting, is correct. See What is FATCA reporting? on page 2 for further information.
SECTION 00 5000
CONTRACTING FORMS AND SUPPLEMENTS

PART 1 GENERAL

1.01 CONTRACTOR IS RESPONSIBLE FOR OBTAINING A VALID LICENSE TO USE ALL COPYRIGHTED DOCUMENTS SPECIFIED BUT NOT INCLUDED IN THE PROJECT MANUAL.

1.02 AGREEMENT AND CONDITIONS OF THE CONTRACT

A. See Section 00 5200 - Agreement Form for the Agreement form to be executed.
B. See Section 00 7200 - General Conditions for the General Conditions.
C. The Agreement is based on AIA A132.
D. The General Conditions are based on AIA A232.

1.03 FORMS

A. Use the following forms for the specified purposes unless otherwise indicated elsewhere in Contract Documents.
B. Post-Award Certificates and Other Forms:
   1. Application for Payment Forms: AIA G702 with AIA G703 (for Contractors).
C. Clarification and Modification Forms:
   2. Request for Proposal Form: ________.
D. Closeout Forms:

1.04 REFERENCE STANDARDS

A. AIA A101 - Standard Form of Agreement Between Owner and Contractor where the basis of Payment is a Stipulated Sum; 2017.
B. AIA A132 - Standard Form of Agreement Between Owner and Contractor, Construction Manager as Adviser Edition; 2009.
D. AIA G701 - Change Order; 2017.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION
**PAYMENT REQUEST FORM**

**Project Name:** LCSD ELLIS ELEMENTARY SCHOOL

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<th>Invoice/Payment Application Number:</th>
<th>Period Ending Date:</th>
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**STATEMENT OF CONTRACT AMOUNT:**

1. Original Contract Amount
2. Approved Change Orders
3. Adjusted Contract Amount (Add or Subtract line 2 from line 1)

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**PROGRESS BILLING:**

4. Work Completed and Materials Provided on Contract to Date (___% to date)
5. Less Retention (5% to date)
6. Total Work Completed and Materials Provided Less Retention (Subtract line 5 from line 4)
7. Total Previous Application for Payments (Line 6 from previous application)
8. **AMOUNT DUE THIS REQUEST** (Subtract line 7 from line 6)

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**LABOR & MATERIALS SUPPLIED THIS MONTH:**

9. Materials supplied this month
10. Labor this month

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Supplier/Subcontractor Lien Releases (DWA provided forms) must be provided prior to distribution of payments. Waiver & Releases attached to this payment request form? (circle one). Yes ☐ No ☐

Name and Amount of Two-Party Checks required on this month’s draw: ________________________________

---

**Company Name:**

DWA Utah Conditional Waiver & Release Upon Progress Payment must be attached to this request.

By: ________________________________

(Signature Here)

Print Name: ________________________________

Title: ________________________________

Date: ________________________________

---

P.O. Box 3448
Logan, UT 84323-3448

Phone: 435-752-6860
Fax: 435-752-7606

[www.dwaconstruct.com](http://www.dwaconstruct.com)
Joint Check Agreement

To induce ______________________ (Supplier) to furnish materials for the premises known and described as:

LCSD Ellis Elementary School

It is agreed that payment for construction materials and services shall be made jointly to ______________________ (Supplier) and ______________________ (Subcontractor). Estimated amount not to exceed $______________.

It further agreed that periodic progress payments will be made in accordance with the following terms: Joint checks will be issued between the two parties for materials purchased during the pay period billed until such time amounts are paid and obligation is satisfied.

It is further agreed that ______________________ (Supplier) shall execute material lien releases equal to the amount of each progress payment and a final, full release upon complete obligation satisfaction.

It is understood that ______________________ (Supplier) and ______________________ (Subcontractor) are in no way acting as a joint venture on this project. ______________________ (Supplier) is acting in the capacity as a material supplier and service provider only.

Agreed and accepted on this ________ day of ___________, 2019.

______________________________  ________________________________
(Supplier)  (Subcontractor)

______________________________  ________________________________
Authorized Signature  Date  Authorized Signature  Date

DWA Construction, Inc.
(General Contractor)

______________________________
Authorized Signature  Date
CONDITIONAL WAIVER AND RELEASE
UPON PROGRESS PAYMENT

Property Name: LCSD ELLIS ELEMENTARY SCHOOL
Property Location: 348 WEST 300 North, Logan, Utah 84321
Undersigned's Customer: ________________________________
Invoice/Payment Application Number: ____________________
Payment Amount: ______________________________________
Payment Period: ______________________________________

To the extent provided below, this document becomes effective to release and the undersigned is considered to waive any notice of lien or right under Utah Code Ann., Title 38, Chapter 1, Mechanics' Liens, or any bond right under Utah Code Ann., Title 14, Contractors Bonds, or Section 83-56-504 related to payment rights the undersigned has on the above described Property once:

1. The undersigned endorses a check in the above referenced Payment Amount payable to the undersigned; and
2. The check is paid by the depository institution on which it is drawn.

This waiver and release applies to a progress payment for the work, materials, equipment, or a combination of work, materials, and equipment furnished by the undersigned to the Property or to the Undersigned's Customer which are the subject of the Invoice or Payment Application, but only to the extent of the Payment Amount.

This waiver and release does not apply to any retention withheld; any items, modifications, or changes pending approval; disputed items and claims; or items furnished or invoiced after the Payment Period.

The undersigned warrants that the undersigned either has already paid or will use the money the undersigned receives from this progress payment promptly to pay in full all the undersigned's laborers, subcontractors, materialmen, and suppliers for all work, materials, equipment, or combination of work, materials, and equipment that are the subject of this waiver and release.

Dated: ________________________________

(Company Name)

By: ________________________________

Its: ________________________________

P.O Box 3448
Logan, Utah 84323-3448

Phone: 435-752-6860
Fax: 435-752-7606

www.dwaconstruct.com
**WAIVER AND RELEASE**
**UPON FINAL PAYMENT**

Property Name: LCSD ELLIS ELEMENTARY SCHOOL  
Property Location: 348 WEST 300 North, Logan, Utah 84321  
Undersigned's Customer:  
Invoice/Payment Application Number:  
Payment Amount:  

To the extent provided below, this document becomes effective to release and the undersigned is considered to waive any notice of lien or right under Utah Code Ann., Title 38, Chapter 1, Mechanics' Liens, or any bond right under Utah Code Ann., Title 14, Contractors Bonds, or Section 63-56-504 related to payment rights the undersigned has on the above described Property once:

1. The undersigned endorses a check in the above referenced Payment Amount payable to the undersigned; and  
2. The check is paid by the depository institution on which it is drawn.

This waiver and release applies to the final payment for the work, materials, equipment, or a combination of work, materials, and equipment furnished by the undersigned to the Property or to the Undersigned’s Customer.

The undersigned warrants that the undersigned either has already paid or will use the money the undersigned receives from the final payment promptly to pay in full all the undersigned's laborers, subcontractors, materialmen, and suppliers for all work, materials, equipment, or combination of work, materials, and equipment that are the subject of this waiver and release.

Dated:  

(Company Name)  

By:  

Its:  

P.O. Box 3448  
Logan, Utah 84323-3448  

Phone: 435-752-6860  
Fax: 435-752-7606  

www.dwaconstruct.com
SUBCONTRACT AGREEMENT

THIS SUBCONTRACT AGREEMENT (hereinafter Agreement), made at Logan, Utah, this 0th day of MONTH, 2019, by and between DWA CONSTRUCTION, INC., P.O. Box 3448, Logan, Utah 84323, hereinafter referred to as DWA, and SUBCONTRACTOR COMPANY NAME; STREET ADDRESS; CITY, STATE, ZIP CODE; PHONE (000) 000-0000 FAX (000) 000-0000, hereinafter referred to as the Subcontractor. DWA and Subcontractor agree as follows:

1. SCOPE OF WORK

a. The Project

LCSD ELLIS ELEMENTARY SCHOOL

348 WEST 300 NORTH

LOGAN, UTAH 84321

b. The work to be performed by the Subcontractor under the terms of this Agreement consists of completion of the Work in a manner that all components will work as intended, and of furnishing of all labor and material, tools, implements, and equipment, scaffolding, permits, fees, warranties, taxes, etc., to do all of the following:

SECTION OR DIVISION NUMBER 00.0000 – NAME OF SECTION OR DIVISION AND DESCRIPTION, FURNISHED AND INSTALLED COMPLETE PER PLANS AND SPECIFICATIONS

ADDENDUMS 00, 01 & 00 ACKNOWLEDGED  
PROJECT COMPLETION DATE: 08-01-21

(All items to be performed by Subcontractor in l.b., l.c. and f.d. are hereafter referenced as the Work).

Base Bid:  $ 00,000.00
Alternates:  $

TOTAL AMOUNT:  $ 00,000.00

PROJECT IS EXEMPT FROM UTAH SALES TAX

c. Work per Contract. The Work shall be done in strict accordance with complete plans and specifications as prepared by DESIGN WEST ARCHITECTS, Architect, for LOGAN CITY SCHOOL DISTRICT. Owner, for which construction DWA has the prime contract and all documents referenced in the prime contract with the Owner, together with all addenda or authorized changes issued prior to the date of execution of this Agreement (hereafter collectively the Contract). Subcontractor acknowledges receipt of all of the Contract. No delineation of duties of the Subcontractor in this Agreement shall be utilized to avoid requirements of the Contract, including plans and specifications, for the Work of Subcontractor.

d. Work Standard. All Work to be performed as set forth herein above shall be complete and shall be accomplished in accordance with the plans, specifications, addenda, shop drawings, and architect’s directions received by Subcontractor. All Work shall be done in a workmanlike manner, shall be acceptable to DWA, and shall comply in every detail to the Owner’s plans and specifications. In the event of any doubt or question arising between DWA and Subcontractor with respect to the Work, the decision of the Architect shall be conclusive and binding.

e. No Architect. Should there be no supervising architect over the Work, then the matter in question shall be determined as provided in Section 11 of this Agreement.

f. Submittals. Within 30 days after signing of this Agreement, Subcontractor shall issue by mail or email all required Submittals to DWA, together with detailed information as to how they comply with the Contract. No submittal shall be deemed accepted until signed in writing by DWA, and acceptance by DWA does not change the requirement of compliance with the contract, plans and specifications, for which subcontractor remains responsible. Any rejected Submittal shall be replaced within seven (7) calendar days of notice of the rejection correcting the reason for the rejection.

2. PAYMENTS

a. Requests for Payment. DWA agrees to pay to the Subcontractor for the satisfactory completion of the Work the sum of Zero thousand zero hundred dollars and 00 cents (0.00) in monthly payments of 55% of the Work performed in any preceding month, in accordance with the Request for Payment prepared by the Subcontractor and as approved by DWA and Architect, such payments to be made only as payments are received by DWA from the Owner covering the approved portion of the Subcontractor’s monthly Request for Payment (Draws). DWA may in its discretion make payments in the name of Subcontractor to any employee, supplier or subcontractors of Subcontractor (hereinafter collectively Subs) who have furnished materials or labor to said Subcontractor for this Project. Subcontractor agrees to use the attached Request for Payment (Exhibit A) in all submittals for payment, and with each submittal for payment to deliver a fully executed Lien Release (Exhibit B for progress payments and Exhibit C for Final Payment) for the Work to date, including but not limited to Lien Releases from all material suppliers and Subs. DWA may modify the form of the Request for Payment and Lien Releases as needed.

b. Documentation and Verification. DWA shall have the right to receive underlying documentation to support any Request for Payment submitted by Subcontractor to DWA. Upon such request, Subcontractor shall provide the underlying documents that justify the costs set forth in the Request for Payment. DWA also has the right and Subcontractor hereby authorizes DWA to communicate with any Subs, suppliers and employees regarding the status of Subcontractor’s accounts with respect to the Project and authorizes all Subs, suppliers and employees to disclose the requested information to DWA.

c. Timing. Draw requests must be submitted by the 25th of each month. Payment to Subcontractor will be made for completed, acceptable Work no later than thirty (30) days after payment has been received by DWA from Owner.

d. No Request for Payment. In the event the Subcontractor does not submit to DWA such Request for Payment prior to the date of submission of DWA’s monthly Draw, then DWA may include in its monthly Draw to the Owner for work performed during the preceding month such amount as it shall deem proper for the Work of the Subcontractor for the preceding month, and the Subcontractor agrees to accept such approved portion thereof as its regular monthly payment, as described above.
c. **Fiduciary Duty.** The Subcontractor agrees that any funds received for the performance of the Work under this Agreement shall be used exclusively for labor, materials, and equipment furnished for this Project, that the Subcontractor has a fiduciary responsibility with respect to these funds, and that these funds will not be diverted to satisfy obligations the Subcontractor may have under any other contracts, debts, liabilities or obligations unrelated to the Project.

d. **Withdrawn or Offsetting Payments.** DWA may withhold a monthly payment and/or final payment to such extent as may be necessary in the exercise of DWA’s discretion to protect DWA from loss for which the Subcontractor is responsible, including but not limited to, loss resulting from defective Work or untimely Work, third party claims, failure of Subcontractor to pay employees or suppliers, incomplete Requests for Payment, failure to submit required documentation, or the filing of any mechanics lien, liens, or other claims. If Subcontractor has unclaimed obligations to DWA on other projects DWA may exercise a right of offset of sums from other projects due to DWA from Subcontractor against any payment due Subcontractor herein.

e. **Extra Work.** If Subcontractor performs extra work or changes to the Work without receiving a written Change Order prior to the execution of such Work, DWA shall be under no obligation to compensate the Subcontractor for such work.

b. **Final Payment and Warranty.** Before final payment is made, the Subcontractor agrees to execute to DWA and/or the Owner a written lien release (together with lien releases from all material suppliers and Subs) and/or waiver, and a written guarantee for its Work, agreeing to make good without cost to the Owner or DWA any and all defects due to imperfect workmanship and/or materials which may appear within the period so established in the contract documents; and if no such period be stipulated in the Contract, then such guarantee shall be executed for a period of one year from date of substantial completion of the Project. The Subcontractor further agrees to execute any special guarantees as provided by the terms of the Contract, prior to final payment.

### 3. PROSECUTION OF WORK, DELAYS, ETC.

a. **Time Is of the Essence and Conflicting Terms.** DWA and the Subcontractor agree to be bound by the terms of the Contract, construction regulations, general conditions, plans and specifications, and any and all other contract documents, if any there be, in so far as applicable to this Agreement, and to that portion of the Work herein described to be performed by the Subcontractor. If conflicting requirements of Subcontractor exist in the Contract and this Agreement or otherwise, Subcontractor shall be bound to do the additional, greater or more costly requirements as part of its bid.

b. **Schedule.** DWA shall establish the Work Schedule (Schedule) within the first month after signing this Agreement, which Schedule may be reasonably modified and refined by DWA, who shall give notice of the same to the Subcontractor. DWA is the owner of the Schedule and of all float and slack time within the Schedule.

c. **Commencement.** Commencement of the Work by Subcontractor is an expression by the Subcontractor that:

   1. This Agreement has been accepted in its entirety;

   2. The Subcontractor has fully reviewed and analyzed all of the Plans and Specifications, this Agreement and Contract documents, and the Total Agreement Amount in paragraph 1.b. is fair, just and complete compensation for the Work;

   3. The Subcontractor is aware of any impact or interference which the site, site conditions, climate, construction sequence, and the work of other Subcontractors will have upon access, operations, efficiency, and related factors of the Work to be performed by the Subcontractor; and

   4. It is the Subcontractor’s responsibility to identify any non-compliant construction details, omissions and discrepancies with respect to the Work and none have been identified.

d. **Due Diligence.** The Subcontractor shall prosecute its Work with due diligence so as not to delay the Project and the work of DWA or other Subcontractors, and in the event that the Subcontractor neglects and/or fails to supply the necessary labor and/or materials, tools, implements, equipment, etc., in the opinion of DWA, then DWA shall notify the Subcontractor in writing setting forth the deficiency and/or delinquency; and within three (3) business days after such written notice, if the Subcontractor fails to correct the Work or to commence and continue correction of such default or neglect with diligence and promptness, DWA shall have the right to take over the Work of the Subcontractor in full, and exclude the Subcontractor from any further participation in the Work covered by this Agreement; or at DWA’s option, DWA may take over such portion of the Subcontractor’s Work as DWA shall deem to be in the best interest of DWA, and permit the Subcontractor to continue with the remaining portions of the Work.

e. **Replacement and Costs.** Whichever method DWA might elect to pursue in c. above, in addition to any and all other remedies in this Agreement, in law and in equity, the Subcontractor agrees to release DWA, for its use only, without recourse, any materials, tools, implements, equipment, etc., on the site, belonging to or in the possession of the Subcontractor, for the benefits of DWA, in correcting or completing the Work covered in this Agreement; and DWA agrees to correct or complete the Work to best of DWA’s ability and in the most economical manner available to DWA at the time. Any costs incurred by DWA in doing any such portion of the Work covered by this Agreement shall be charged against any monies due or to become due under the terms of this Agreement; and in the event the total amount due or to become due under the terms of this Agreement shall be insufficient to cover the costs accrued by DWA in completing the Work, the Subcontractor and its sureties, if any, shall be bound and liable to DWA for the difference.

f. **Delays.** If Subcontractor believes any delays in the Schedule are required through no fault of the Subcontractor, within seven (7) days after the event giving rise to the delay, Subcontractor shall submit a written change order to DWA, specifying and detailing any basis for increased costs and upon failure to timely submit, Subcontractor waives any right to submit or have approved the change order.

g. **Delay Liability.** The Subcontractor shall not be held liable for any delays arising out of acts of God, strikes, embargoes, or other causes explicitly determined to be beyond the control of the Subcontractor. Subcontractor shall be responsible for liquidated damages of $1,000.00 per day for any delay to DWA or any other subcontractors which may be directly attributable to Subcontractor; and provided, further, that if the Subcontractor fails to meet the Schedule as determined by DWA and as it may reasonably be amended from time to time by DWA under this Agreement, DWA may withhold from the contract price due the Subcontractor under this Agreement an amount equal to $1,000.00 per day times the number of days after the Schedule until that portion of the Work is completed, and in such event shall apply said sum against all sums owing from DWA to Subcontractor, and Subcontractor agrees to pay any deficiency on demand. All delay charges will be deducted from the amount due Subcontractor.

h. **Defects.** Should the proper and accurate performance of any Work under this Agreement depend wholly or partially upon the proper workmanship or accurate performance of any work or materials furnished by DWA or of other Subcontractors on the Project, the Subcontractor agrees to use all means necessary to discover any such defects and report the same in writing to DWA before proceeding with the Work which is so dependent, and shall allow DWA a reasonable amount of time in which to remedy such defects; and in the event Subcontractor does not so report to DWA in writing, then it shall be assumed that the Subcontractor has fully accepted the work of others as being satisfactory, and Subcontractor shall be fully responsible therefor for the satisfactory performance of the Work covered by this Agreement, regardless of the defective work of others.

i. **Clean-up.** Subcontractor will be responsible for clean-up, removal, and proper disposal of all debris from working on the Project. Failure to clean up rubbish and debris shall be cause for withholding further payments to Subcontractor until such time as this condition is corrected to the satisfaction of DWA. Use of the dumpster located on the
Project site is under the discretion of DWA, and all charges for use will be deducted from sums due Subcontractor. Daily clean up of all tools, equipment, material, and debris is required.

j. Loss/Theft. DWA assumes no responsibility whatsoever on account of any loss or damage to tools or equipment or for materials while on the Project site prior to installation. Further, DWA assumes no responsibility whatsoever on account of loss by theft or otherwise of Subcontractor’s tools or equipment while on the Project site.

k. Subs. The Subcontractor represents and warrants the following to be the sole Subs and sole suppliers:

No Subs or suppliers may be changed without the written consent of DWA.

l. Punchlist Items. When the Subcontractor considers that the Work is substantially complete, the Subcontractor shall prepare and submit to DWA a comprehensive list of items to be completed or corrected prior to final payment (the Punchlist). DWA shall have the right to supplement the Punchlist with additional items that DWA or Owner deems reasonably necessary to complete the Project based upon DWA’s or Owner’s independent inspection of the Work. Failure to include an item on the Punchlist shall not alter the responsibility of the Subcontractor to complete all Work in accordance with the Contract Documents.

m. Final Completion. The Subcontractor shall cause Punchlist items to be completed within the timeframe, if any, determined by the Architect or, if no timeframe is so determined, then within thirty (30) days of the Completion Date. In the event that the Subcontractor fails to correct or promptly commence to correct the deficiencies within the time period required for the Subcontractor to do so, DWA may, upon three (3) days written notice to the Subcontractor, take over and perform some or all of the Punchlist items. DWA may deduct from the final payment the actual cost to DWA of performing or causing others to perform these Punchlist items. DWA may withhold one hundred and fifty percent (150%) or the amount determined by the Architect, whichever is greater, of the estimated cost to complete the Punchlist items until Subcontractor completes the Punchlist items in accordance with the Contract Documents or DWA completes or causes others to complete the Punchlist items.

4. SAFETY

The Subcontractor shall perform all Work in compliance with all Federal, State, and Local Safety regulations and standards (including OSHA). DWA’s Safety rules and policies, and in such manner that will protect the Subcontractor’s employees and others from injury. The Subcontractor shall require all persons, employees, workers, material men related to the performance of this Agreement to wear regulation hard hats while on the Project site. If Subcontractor’s employees are found on the Project site not wearing hard hats after written notice has been previously given to comply with this provision, Subcontractor will be subject to a $25.00 per occurrence fine, which will be deducted from sums due Subcontractor. In addition, Subcontractor agrees to pay any and all fines, penalties and assessments resulting from failure to comply with any of the foregoing and to indemnify and hold DWA harmless from payment of the same. If any unsafe work is being performed by others on the Project and is observed by the Subcontractor, Subcontractor shall notify DWA immediately of such.

5. SURETY BOND

The Subcontractor agrees to furnish to DWA, at the Subcontractor’s expense, a surety bond guaranteeing the faithful performance, including completion, of this Agreement and the payment of all labor and material bills in connection with the execution of the Work covered by this Agreement. The bond is to be written by a surety company designated or approved by DWA, and in a form satisfactory to DWA.

6. PERMITS, LICENSES, FEES, TAXES, ETC.

The Subcontractor shall, at Subcontractor’s own cost and expense, apply for and obtain all necessary permits and licenses and shall conform strictly to the laws, ordinances and regulations in force in the locality where the Work on the Project is being done. The Subcontractor shall indemnify and hold DWA harmless against liability by reason of the Subcontractor having failed to pay federal, state, county or municipal taxes to or otherwise comply with applicable laws, ordinances and regulations.

7. INSURANCE

a. The Subcontractor agrees to comply in all respects with the employment and payment of labor required by law.

b. The Subcontractor agrees to carry comprehensive public liability and property damage insurance, and such other insurance as DWA might deem necessary, in an amount as approved by DWA in order to protect Owner, DWA and Subcontractor against loss resulting from any acts of the Subcontractor, its agents and/or employees, including but not limited to the following:

1. Commercial General Liability policy (CGL) with limits not less than $1,000,000 each occurrence and $2,000,000 aggregate for the Project.
   a. CGL coverage must be written on ISO occurrence form CG 00 01 10 01 or an equivalent, providing coverage for the indemnifications required in this Agreement, including but not limited to independent contractors, products-completed operations, personal injury and property damage.
   b. DWA, Owner and all other parties required of DWA, must be named as an additional insured on the CGL policy using an additional insured endorsement that provides primary, non-contributory coverage AND completed operations coverage.
   c. The subcontractor must maintain CGL coverage for itself and all additional insureds for the duration of the Project and maintain Complete Operations coverage for itself and each additional insured for at least 3 years after completion of the Work or the length of the state’s statute of repose, whichever is greater.
2. Business Automobile Liability coverage with limits of $1,000,000 each accident. Coverage should include liability arising out of all owned, leased, hired and non-owned automobiles.
3. Commercial Umbrella coverage with limits of at least $2,000,000. Coverage must include all entities that are additional insureds on the CGL.
4. Workers’ Compensation and Employers’ Liability coverage with limits of at least $500,000 each accident, $500,000 for bodily injury by accident, and $50,000 each employee for injury by disease.
5. To the fullest extent permitted by law, all policies must provide a waiver of subrogation on the CGL, Business Automobile, Workers’ Compensation and Umbrella Liability policies.
8. ASSUMPTION OF DUTIES AND INDEMNIFICATION

a. The Subcontractor assumes toward DWA all the obligations and responsibilities that DWA assumes toward the Owner. The Subcontractor shall indemnify DWA and the Owner against, and save them harmless from, any all loss, damage, expenses, costs, and attorney’s fees incurred or suffered on account of any breach this Agreement, or any conditions, provisions or covenants of the Agreement.

To the fullest extend permitted by law, Subcontractor shall indemnify, defend, and hold harmless DWA and its agents, affiliates, and employees from and against all claims, liabilities, damages, losses, and expenses, including but not limited to attorney’s fees, arising out of or resulting from the performance of the Work, provided that any such claim, liability, damage, loss or expense (1) is attributable to bodily injury, sickness, disease, or death, or to injury or destruction of tangible property including the loss of use resulting therefrom, or (2) due to any failure by Subcontractor to make any payment to Subs, materials providers, or others who have provided services or materials in connection with the Work. In the event of any collection action or mechanics lien filed by a labor or materials supplier against the Project for which DWA or Owner has paid or any other claim arising under this paragraph or Agreement, DWA may either (i) tender the defense of such claims to Subcontractor or (ii) retain an attorney and defend such claims and receive reimbursement from Subcontractor for all costs and attorney fees thereby incurred, and (3) is caused by whole or in part by an act or an omission of Subcontractor, anyone directly or indirectly employed by Subcontractor, or anyone for whose acts Subcontractor may be liable, regardless of whether or not it is caused in part by a party indemnified hereunder.

9. CHANGES, ADDITIONS AND DEDUCTIONS

a. DWA may add or deduct from the amount of Work covered by this Agreement; and any changes made in the amount of Work involved, or any other parts of this Agreement, shall be by a written amendment hereto setting forth in detail the changes involved and the value thereof which shall be mutually agreed upon between DWA and the Subcontractor; if mutual agreement is not possible, then the value of the Work shall be determined as provided in Section 11 of this Agreement. In either event, however, the Subcontractor agrees to proceed with the Work as charged when so ordered in writing by DWA so as not to delay the progress of the Work, and pending any determination of the value thereof.

b. Change orders must be broken down by material and labor with markups as indicated in the specifications.

c. The Subcontractor agrees to make no claim for additional, extra or changed work outside the scope of this Agreement, and the terms hereof shall be conclusive with respect to this Agreement unless altered in writing signed by the parties.

d. The Subcontractor agrees not to sublet, transfer or assign this Agreement or any funds due or to become due or any part thereof without the written consent of DWA.

e. Any questions, clarifications, etc. must be submitted in writing to DWA as soon as they arise.

f. Do not proceed with any changes or alterations to the plans and specifications without written approval from Architect and DWA.

g. The Subcontractor shall promptly comply with Construction Directives.

10. BACK CHARGES

There will absolutely be no back charges and/or extra charges by Subcontractor against DWA or Owner, without prior approval in writing signed by DWA. Otherwise, any back charges are prohibited, null and void, and shall be absorbed by the Subcontractor. Any back charges assessed to the Subcontractor by DWA will be calculated at cost plus 10%.

11. DISPUTES

In the event of any dispute between DWA and Subcontractor covering the scope of the Work, the dispute shall be settled in the manner provided by the Contract for the Project. If none be provided, or if there arises any dispute concerning matters in connection with this Agreement and/or the scope of Work, then such disputes shall be first submitted to mediation with a qualified mediator, and if mediation is not successful, then settled by a ruling of a board of arbitration consisting of three members, one selected by DWA, one by the Subcontractor, and the third member shall be selected by the first two members. DWA and Subcontractor shall bear the expense of their selected members respectively, but the expenses of the third member shall be borne by the party requesting the arbitration in writing. DWA and Subcontractor agree to be bound by the findings of any such board of arbitration, finally and without recourse to any courts of law.

12. DEFAULT AND TERMINATION OF CONTRACT

a. Default. The following events, or any of them, shall constitute events of default by the Subcontractor:

(1) Failure to perform Work as required by the Schedule;
(2) Failure or neglect to correct Work found to be defective by and at the reasonable discretion of DWA;
(3) Failure to supply materials which have been specified, or to supply the specified quality;
(4) Failure to supply materials of sufficient quantity;
(5) Failure to begin Work pursuant to the terms of this Agreement;
(6) Failure to supply a workforce of sufficient size or skill level;
(7) Failure to carry out and complete the Work without delay to the Project, DWA, or other subcontractors;
(8) Failure to make prompt payments for materials, labor, equipment and services provided to the Project;
(9) Failure to observe and abide by all applicable laws, ordinances, rules, regulations or orders of any public authority having jurisdiction over the Project;
(10) In the sole opinion of DWA, abandonment of the Project and the Subcontractor’s Work under this Agreement;
(11) Failure to comply with the licensing laws of the state in which the Work is performed;
(12) Failure to comply with any of the terms of this Agreement;
(13) Reasonable doubt that the remaining Work of Subcontractor can be completed for the then unpaid balance to the Subcontractor.
(14) DWA in its reasonable discretion determines Subcontractor’s ability to complete the Work or complete it in a timely manner is uncertain or unlikely.

b. Notice of Default. If the Subcontractor fails to perform in accordance with the terms of this Agreement, DWA may provide to Subcontractor a “Notice of Default” specifying the nature of the Subcontractor’s default.

c. Remedy of Default. The Subcontractor shall have three (3) business days from the time of issuance of the Notice of Default to remedy and correct the default. However, if such default is not corrected within the terms or time limits required for performance under this Agreement, or if in the sole discretion of DWA, the Subcontractor will not be able to do so, DWA may terminate this Agreement and dismiss the Subcontractor from the Project and have the Work performed by itself or others.

(1) Termination of this Agreement by default shall not relieve the Subcontractor from obligations of warranty, quality and conformity of the Work, and any and all payments due from the Subcontractor or any other terms included in this Agreement.

(2) The Subcontractor agrees to release to DWA, without recourse, any materials on the Project site belonging to the Subcontractor for the benefit of completing the Work.

d. No Waiver of Default. Any failure by DWA to enforce or require the strict keeping and performance of any of the terms or conditions of this Agreement:

(1) Shall not constitute a waiver of the terms or conditions of this Agreement,

(2) Shall not affect or impair such terms or conditions in any way,

(3) Shall not impair or waive the right of DWA to avail itself of such remedies as it may have for any breach or breaches of the terms or conditions of this Agreement.

e. Termination.

(1) If the Work has been stopped, abandoned or suspended for more than ninety (90) calendar days not due to the fault or neglect of the Subcontractor, or if DWA has refused or neglected to pay amounts due to the Subcontractor pursuant to this Agreement within thirty (30) calendar days after such amounts have become due, and if DWA fails to cure such default within seven (7) business days after receiving a written notice from the Subcontractor of such default, then the Subcontractor may terminate this Agreement upon giving DWA seven (7) business days’ prior written notice. The Subcontractor shall have no right to terminate this Agreement or suspend services hereunder on account of a failure by the Owner to make payment to DWA for all or any portion of the Work. Upon such termination, the Subcontractor shall be entitled to recover from DWA payment for all Work satisfactorily performed and for which payment has been received by DWA from the Owner but not yet paid to the Subcontractor. In no event shall DWA be liable to the Subcontractor or to persons or entities performing any portion of the Work for or on behalf of the Subcontractor, for any special, indirect or consequential damages or losses of anticipated profits arising out of a termination by the Subcontractor pursuant to this Paragraph 12.e.(1).

(2) Should the Owner terminate its Contract with DWA, or any part which includes the Work, DWA shall so notify the Subcontractor in writing in a timely manner, and upon written notification, this Agreement shall be terminated and the Subcontractor shall immediately stop the Work, follow DWA’s instruction regarding shutdown and termination procedures, and mitigate all costs. Any termination of this Agreement pursuant to this Paragraph 12.e.(2) shall be without liability to DWA.

(3) DWA may, at any time, and at its sole discretion, terminate this Subcontractor without cause and without regard to any fault or failure to perform by any party, and solely for DWA’s convenience. Termination by DWA for convenience shall be by notice of termination delivered to the Subcontractor specifying the effective date thereof. In the event of DWA’s termination of the Agreement for convenience, DWA shall pay to the Subcontractor the portion of the Agreement price allocable to the Work satisfactorily completed prior to the effective date of termination and for which payment has been received by DWA from the Owner. In no event shall DWA be liable to the Subcontractor or persons or entities performing any portion of the Subcontractor’s work for or on behalf of the Subcontractor, for any special, indirect or consequential damages or losses of anticipated profits arising out of a termination of the Agreement by DWA for convenience pursuant to this Paragraph 12.e.(3). Upon a determination by an arbitrator that a termination of the Agreement by DWA for cause pursuant to Paragraph 12.e(4) was wrongful, such termination will be deemed converted to a termination for convenience pursuant to this Paragraph 12.e(3) and the Subcontractor’s remedies for wrongful termination shall be limited to the recovery of the payments permitted for a termination by DWA for convenience as set forth in this Paragraph 12.e.(3).

(4) If the Subcontractor fails to correct or to commence and satisfactorily continue correction of a default within three (3) business days after written notification issued under Paragraph 12.b, then DWA may terminate the Agreement for cause. Upon such termination, DWA may use any materials, implements, equipment, appliances or tools furnished by or belonging to the Subcontractor to complete the Work. DWA also may furnish those materials and equipment and/or employ such workers or subcontractors as DWA deems necessary to maintain the orderly progress of the Work. All costs and expenses incurred by DWA in performing the Work and in employing others to perform the Work, including reasonable overhead, profit and attorneys’ fees, shall be deducted from any monies due or to become due the Subcontractor under this Agreement. The Subcontractor shall be liable for the payment of any amount by which such costs and expenses plus any other damages suffered by DWA as a consequence of the Subcontractor’s breach of this Agreement may exceed the unpaid balance of the Agreement price.

f. Conditions Following Subcontractor Termination for Cause.

(1) Right of Retention. Upon receipt or the sending of a Notification to Terminate, or upon termination of this Agreement under Paragraph 12.e(4), the Subcontractor acknowledges the right of DWA to retain:

(a) Up to 10% of the total value of all Work performed by the Subcontractor through the expiration of the warranty period, or

(b) Up to 10% of the total value of all Work performed by the Subcontractor for a period not exceeding the statute of limitations for liens, or

(c) Up to 10% of the total value of all Work performed by the Subcontractor for a period not to exceed the time allowed by law for filing wage claims by the Subcontractor’s employees.

(2) If the Subcontractor is called upon to perform warranty work and the Subcontractor fails to correct such Work within the warranty terms of this Agreement, DWA may use the retained funds to pay for the correction of the defective Work.

(3) Any funds retained pursuant to this Section shall be released in full to the Subcontractor within ten business days of the expiration of the applicable retention term if all warranty Work has been performed and completed pursuant to the terms of this Agreement.
g. Suspension. DWA may, for just cause or by direction, suspend all or part of the Subcontractor’s Work. DWA will give written notice to the Subcontractor stating the nature, effective date and anticipated duration of such suspension, whereupon the Subcontractor shall suspend Work to the extent specified and shall place no further orders or perform no other Work except as permitted by DWA’s notice of suspension. During the period of such suspension, the Subcontractor must care for all Work, materials and equipment at the Project site or at storage areas under the Subcontractor’s responsibility. The Agreement price shall be adjusted by Change Order if the cost of the Work is increased or decreased by reason of such suspension. If additional time for completion of the Work is required as a result of such suspension, the Subcontractor shall submit a written request for additional time prior to resuming the Work. Failure to submit a written request for additional time due to such suspension shall result in no extension of time being granted.

In the event the prime contract between the Owner and DWA should be terminated prior to its completion, then DWA and Subcontractor agree that an equitable settlement for Work performed (less damages and offsets) under this Agreement prior to such termination will be made as provided by the contract documents, if such provision be made; or, if none such exist, next by mutual agreement; or failing either of these methods, by arbitration as provided in Section 11.

13. FINANCIAL POSITION

Subcontractor herewith certifies that no bankruptcy proceeding has been filed in any chapter of the United States or State Bankruptcy Acts, and further that no such bankruptcy action is intended or contemplated by said Subcontractor, or if Subcontractor has filed or files a voluntary or any creditor files against Subcontractor an involuntary petition under any facet of the Bankruptcy Act, DWA may terminate this Agreement and immediately be relieved of any further obligations except as provided in Section 11 of this Agreement. Subcontractor also authorizes DWA to regularly as determined by DWA obtain credit and other financial reports on Subcontractor.

14. ENFORCEMENT

Upon default, the defaulting party agrees to pay all costs and attorney’s fees reasonably incurred by the party not in default in enforcing the terms of this Agreement of its rights herein.

15. SEVERABILITY

If any paragraph or portion of this Agreement is found illegal or unenforceable for any reason, the rest of this Agreement shall remain in full force and effect, and the failure of one clause shall not affect any other clause or paragraph of this Agreement.

DWA and Subcontractor signify their understanding and agreement with the terms by signing, and that this document incorporates the full understanding and agreement between the parties.

CONTRACTOR:

DWA CONSTRUCTION, INC.

DATED: 00-00-0000

By: __________________________

Title: PRESIDENT

SUBCONTRACTOR:

NAME OF SUBCONTRACTOR

DATED: ________________________

By: __________________________

Title: _________________________

Tax Id No. ____________________
SECTION 00 7200
GENERAL CONDITIONS

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

RELATED REQUIREMENTS
2.01 SECTION 01 4216 - DEFINITIONS.

END OF SECTION
PART 1 GENERAL

1.01 PROJECT
A. Project Name: Ellis Elementary School Rebuild.
B. Owner's Name: Logan City School District.
C. Architect's Name: Design West Architects.
D. Additional Project contact information is specified in Section - 000103 - Project Directory.

1.02 CONTRACT DESCRIPTION
A. Contract Type: A single prime contract based on a Stipulated Price as described in Document 00 5000 - Contracting Forms and Supplements.

1.03 DESCRIPTION OF ALTERATIONS WORK
A. Scope of demolition and removal work is indicated on drawings.
B. Scope of alterations work is indicated on drawings.

1.04 WORK BY OWNER
A. Items noted NIC (Not in Contract) will be supplied and installed by Owner before Substantial Completion. Some items include:
   1. Movable cabinets.
   2. Furnishings.
   3. Small equipment.
B. Owner will supply the following for installation by Contractor:
   1. As indicated on the drawings.

1.05 OWNER OCCUPANCY
A. Owner intends to continue to occupy adjacent portions of the existing building during the entire construction period.
B. Owner intends to occupy the Project upon Substantial Completion.
C. Cooperate with Owner to minimize conflict and to facilitate Owner's operations.
D. Schedule the Work to accommodate Owner occupancy.

1.06 CONTRACTOR USE OF SITE AND PREMISES
A. Provide access to and from site as required by law and by Owner:
   1. Emergency Building Exits During Construction: Keep all exits required by code open during construction period; provide temporary exit signs if exit routes are temporarily altered.
   2. Do not obstruct roadways, sidewalks, or other public ways without permit.
B. 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 SPECIFICATION SECTIONS APPLICABLE TO ALL CONTRACTS
A. Unless otherwise noted, all provisions of the sections listed below apply to all contracts. Specific items of work listed under individual contract descriptions constitute exceptions.
B. Section 00 0103 - Project Directory.
C. Section 01 2000 - Price and Payment Procedures.
D. Section 01 2100 - Allowances.
E. Section 01 2300 - Alternates.
F. Section 01 3000 - Administrative Requirements.
G. Section 01 3114 - Facility Services Coordination.
H. Section 01 4000 - Quality Requirements.
I. Section 01 4216 - Definitions.
J. Section 01 4219 - Reference Standards.
K. Section 01 5000 - Temporary Facilities and Controls.
L. Section 01 5100 - Temporary Utilities.
M. Section 01 5213 - Field Offices and Sheds.
N. Section 01 5500 - Vehicular Access and Parking.
O. Section 01 7000 - Execution and Closeout Requirements.
P. Section 01 7800 - Closeout Submittals.

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

END OF SECTION
SECTION 01 2000
PRICE AND PAYMENT PROCEDURES

PART 1  GENERAL

1.01  SECTION INCLUDES
A. Procedures for preparation and submittal of applications for progress payments.

1.02  SCHEDULE OF VALUES
A. Electronic media printout including equivalent information will be considered in lieu of standard form specified; submit draft to Architect for approval.
B. Forms filled out by hand will not be accepted.

1.03  APPLICATIONS FOR PROGRESS PAYMENTS
A. Payment Period: Submit at intervals stipulated in the Agreement.
B. Use Form AIA G702 and Form AIA G703, edition stipulated in the Agreement.
C. 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. Execute certification by signature of authorized officer.
F. Use data from approved Schedule of Values. Provide dollar value in each column for each line item for portion of work performed and for stored products.
G. List each authorized Change Order as a separate line item, listing Change Order number and dollar amount as for an original item of work.
H. Submit one electronic and three hard-copies of each Application for Payment.

1.04  MODIFICATION PROCEDURES
A. For minor changes not involving an adjustment to the Contract Sum or Contract Time, Architect will issue instructions directly to Contractor.
B. For other required changes, Architect will issue a document signed by Owner instructing Contractor to proceed with the change, for subsequent inclusion in a Change Order.
   1. The document will describe the required changes and will designate method of determining any change in Contract Sum or Contract Time.
   2. Promptly execute the change.
C. For changes for which advance pricing is desired, Architect will issue a document that includes a detailed description of a proposed change with supplementary or revised drawings and specifications, a change in Contract Time for executing the change with a stipulation of any overtime work required and the period of time during which the requested price will be considered valid. Contractor shall prepare and submit a fixed price quotation within ____ days.
D. Contractor may propose a change by submitting a request for change to Architect, describing the proposed change and its full effect on the work, with a statement describing the reason for the change, and the effect on the Contract Sum and Contract Time with full documentation. Document any requested substitutions in accordance with Section 01 6000.
E. Computation of Change in Contract Amount: As specified in the Agreement and Conditions of the Contract.
F. Substantiation of Costs: Provide full information required for evaluation.
   1. On request, provide the following data:
      a. Quantities of products, labor, and equipment.
      b. Taxes, insurance, and bonds.
      c. Overhead and profit.
      d. Justification for any change in Contract Time.
      e. Credit for deletions from Contract, similarly documented.
   2. Support each claim for additional costs with additional information:
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.

J. Promptly enter changes in Project Record Documents.

1.05 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.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION
SECTION 01 2500
SUBSTITUTION PROCEDURES

PART 1 GENERAL

1.01 RELATED REQUIREMENTS

A. Section 01 2300 - Alternates, for product alternatives affecting this section.
B. Section 01 3000 - Administrative Requirements: Submittal procedures, coordination.

1.02 DEFINITIONS

A. Substitutions: Changes from Contract Documents requirements proposed by Contractor to materials, products, assemblies, and equipment.
   1. Substitutions for Cause: Proposed due to changed Project circumstances beyond Contractor's control.
      a. Unavailability.
      b. Regulatory changes.
   2. Substitutions for Convenience: Proposed due to possibility of offering substantial advantage to the Project.
      a. Substitution requests offering advantages solely to the Contractor will not be considered.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 GENERAL REQUIREMENTS

A. A Substitution Request for products, assemblies, materials, and equipment constitutes a representation that the submitter:
   1. Has investigated proposed product and determined that it meets or exceeds the quality level of the specified product, equipment, assembly, or system.
   2. Agrees to provide the same warranty for the substitution as for the specified product.
   3. Agrees to provide same or equivalent maintenance service and source of replacement parts, as applicable.
   4. Agrees to coordinate installation and make changes to other work that may be required for the work to be complete, with no additional cost to Owner.
   5. Waives claims for additional costs or time extension that may subsequently become apparent.

B. Document each request with complete data substantiating compliance of proposed substitution with Contract Documents. Burden of proof is on proposer.

C. Content: Include information necessary for tracking the status of each Substitution Request, and information necessary to provide an actionable response.
   1. No specific form is required. Contractor's Substitution Request documentation must include the following:
      a. Project Information:
         1) Owner's, Architect's, and Contractor's names.
      b. Substitution Request Information:
         1) Discrete and consecutive Substitution Request number, and descriptive subject/title.
         2) Indication of whether the substitution is for cause or convenience.
         3) Issue date.
         4) Reference to particular Contract Document(s) specification section number, title, and article/paragraph(s).
         5) Description of Substitution.
         6) Reason why the specified item cannot be provided.
         7) Differences between proposed substitution and specified item.
         8) Description of how proposed substitution affects other parts of work.
c. Attached Comparative Data: Provide point-by-point, side-by-side comparison addressing essential attributes specified, as appropriate and relevant for the item:
   1) Physical characteristics.
   2) In-service performance.
   3) Expected durability.
   4) Visual effect.
   5) Sustainable design features.
   6) Warranties.
   7) Other salient features and requirements.
   8) Include, as appropriate or requested, the following types of documentation:
      (a) Product Data:
      (b) Samples.
      (c) Drawings, when required to show impact on adjacent construction elements.

d. Impact of Substitution:
   1) Savings to Owner for accepting substitution.
   2) Change to Contract Time due to accepting substitution.

D. Limit each request to a single proposed substitution item.
   1. Submit an electronic document, combining the request form with supporting data into single document.

3.02 SUBSTITUTION PROCEDURES DURING PROCUREMENT
A. Instructions to Bidders specifies time restrictions for submitting requests for substitutions during the bidding period, and the documents required.

3.03 RESOLUTION
A. Architect may request additional information and documentation prior to rendering a decision. Provide this data in an expeditious manner.

B. Architect will notify Contractor in writing of decision to accept or reject request.
   1. Architect’s decision following review of proposed substitution will be noted on the submitted form.

3.04 ACCEPTANCE
A. Accepted substitutions change the work of the Project. They will be documented and incorporated into work of the project by Change Order, Construction Change Directive, Architectural Supplementary Instructions, or similar instruments provided for in the Conditions of the Contract.

END OF SECTION
SECTION 01 3000
ADMINISTRATIVE REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES
A. General administrative requirements.
B. Electronic document submittal service.
C. Preconstruction meeting.
D. Site mobilization meeting.
E. Progress meetings.
F. Construction progress schedule.
G. Progress photographs.
H. Coordination drawings.
I. Submittals for review, information, and project closeout.
J. Number of copies of submittals.
K. Requests for Interpretation (RFI) procedures.
L. Submittal procedures.

1.02 GENERAL ADMINISTRATIVE REQUIREMENTS
A. Comply with requirements of Section 01 7000 - Execution and Closeout Requirements for coordination of execution of administrative tasks with timing of construction activities.
B. Make the following types of submittals to Architect:
   1. Requests for Interpretation (RFI).
   2. Requests for substitution.
   3. Shop drawings, product data, and samples.
   4. Test and inspection reports.
   5. Manufacturer's instructions and field reports.
   6. Applications for payment and change order requests.
   7. Progress schedules.
   8. Coordination drawings.
   9. Correction Punch List and Final Correction Punch List for Substantial Completion.
   10. Closeout submittals.

1.03 PROJECT COORDINATOR
A. Project Coordinator: Construction Manager.
B. Cooperate with the Project Coordinator in allocation of mobilization areas of site; for field offices and sheds, for ________ access, traffic, and parking facilities.
C. During construction, coordinate use of site and facilities through the Project Coordinator.
D. Comply with Project Coordinator's procedures for intra-project communications; submittals, reports and records, schedules, coordination drawings, and recommendations; and resolution of ambiguities and conflicts.
E. Comply with instructions of the Project Coordinator for use of temporary utilities and construction facilities. Responsibility for providing temporary utilities and construction facilities is identified in Section 01 1000 - Summary.
F. Coordinate field engineering and layout work under instructions of the Project Coordinator.
G. Make the following types of submittals to Architect through the Project Coordinator:
   1. Requests for Interpretation.
   2. Requests for substitution.
   3. Shop drawings, product data, and samples.
4. Test and inspection reports.
5. Design data.
6. Manufacturer's instructions and field reports.
7. Applications for payment and change order requests.
8. Progress schedules.
9. Coordination drawings.
10. Correction Punch List and Final Correction Punch List for Substantial Completion.
11. Closeout submittals.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 ELECTRONIC DOCUMENT SUBMITTAL SERVICE

A. All documents transmitted for purposes of administration of the contract are to be in electronic (PDF, MS Word, or MS Excel) format, as appropriate to the document, 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 Interpretation (RFIs), progress documentation, contract modification documents (e.g. supplementary instructions, change proposals, change orders), applications for payment, field reports and meeting minutes, Contractor's correction punchlist, and any other document any participant wishes to make part of the project record.
2. Contractor and Architect are required to use this service.
3. It is Contractor's responsibility to submit documents in allowable format.
4. Subcontractors, suppliers, and Architect's consultants will 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, or Bluebeam PDF Revu, www.bluebeam.com), unless such software capability is provided by the service provider.
6. Paper document transmittals will not be reviewed; emailed electronic 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. 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.

C. 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. Project Coordinator will schedule a meeting after Notice to Proceed.

B. Attendance Required:
1. Owner.
3. Contractor.

C. Agenda:
1. Submission of list of subcontractors, list of products, schedule of values, and progress schedule.
2. Submission of initial Submittal schedule.
4. Procedures and processing of field decisions, submittals, substitutions, applications for payments, proposal request, Change Orders, and Contract closeout procedures.
5. Scheduling.
D. Record minutes and distribute copies within four days after meeting to participants, with copies to Architect, Owner, participants, and those affected by decisions made.

3.03 SITE MOBILIZATION MEETING

A. Project Coordinator will schedule meeting at the Project site prior to Contractor occupancy.

B. Attendance Required:
   1. Contractor.
   3. Contractor's superintendent.
   4. Major subcontractors.

C. Agenda:
   1. Use of premises by Owner and Contractor.
   2. Owner's requirements.
   3. Construction facilities and controls provided by Owner.
   4. Temporary utilities provided by Owner.
   5. Survey and building layout.
   7. Schedules.
   8. Application for payment procedures.
   9. Procedures for testing.
   11. Requirements for start-up of equipment.
   12. Inspection and acceptance of equipment put into service during construction period.

D. Record minutes and distribute copies within four days after meeting to participants, with copies to Architect, Owner, participants, and those affected by decisions made.

3.04 PROGRESS MEETINGS

A. Schedule and administer meetings throughout progress of the work at maximum weekly intervals.

B. Attendance Required:
   1. Contractor.
   2. Owner.
   3. Architect.
   4. Contractor's superintendent.
   5. Major subcontractors.

C. Agenda:
   1. Review minutes of previous meetings.
   2. Review of work progress.
   3. Field observations, problems, and decisions.
   4. Identification of problems that impede, or will impede, planned progress.
   5. Review of submittals schedule and status of submittals.
   7. Maintenance of progress schedule.
   8. Corrective measures to regain projected schedules.
   9. Planned progress during succeeding work period.
   10. Coordination of projected progress.
   11. Maintenance of quality and work standards.
   12. Effect of proposed changes on progress schedule and coordination.
   13. Other business relating to work.

D. Record minutes and distribute copies within four days after meeting to participants, with copies to Architect, Owner, participants, and those affected by decisions made.
3.05 CONSTRUCTION PROGRESS SCHEDULE
   A. If preliminary schedule requires revision after review, submit revised schedule within 10 days.
   B. 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.
   C. Within 10 days after joint review, submit complete schedule.
   D. Submit updated schedule with each Application for Payment.

3.06 PROGRESS PHOTOGRAPHS
   A. Maintain one set of all photographs at project site for reference; same copies as submitted, identified as such.
   B. Photography Type: Digital; electronic files.
   C. Digital Photographs: 24 bit color, minimum resolution of 1024 by 768, in JPG format; provide files unaltered by photo editing software.
      1. Delivery Medium: Via email.
      2. File Naming: Include project identification, date and time of view, and view identification.
      3. PDF File: Assemble all photos into printable pages in PDF format, with 2 to 3 photos per page, each photo labeled with file name; one PDF file per submittal.

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

3.08 REQUESTS FOR INTERPRETATION(RFI)
   A. Definition: A request seeking one of the following:
      1. An interpretation, amplification, or clarification of some requirement of Contract Documents arising from inability to determine from them the exact material, process, or system to be installed; or when the elements of construction are required to occupy the same space (interference); or when an item of work is described differently at more than one place in Contract Documents.
      2. A resolution to an issue which has arisen due to field conditions and affects design intent.
   B. Whenever possible, request clarifications at the next appropriate project progress meeting, with response entered into meeting minutes, rendering unnecessary the issuance of a formal RFI.
   C. Preparation: Prepare an RFI immediately upon discovery of a need for interpretation of Contract Documents. Failure to submit a RFI in a timely manner is not a legitimate cause for claiming additional costs or delays in execution of the work.
      1. Prepare a separate RFI for each specific item.
         a. Review, coordinate, and comment on requests originating with subcontractors and/or materials suppliers.
         b. Do not forward requests which solely require internal coordination between subcontractors.
      2. Prepare using an electronic version of the form appended to this section.
      3. Prepare using software provided by the Electronic Document Submittal Service.
      4. Combine RFI and its attachments into a single electronic file. PDF format is preferred.
   D. Reason for the RFI: Prior to initiation of an RFI, carefully study all Contract Documents to confirm that information sufficient for their interpretation is definitely not included.
   E. Content: Include identifiers necessary for tracking the status of each RFI, and information necessary to provide an actionable response.
      1. Official Project name and number, and any additional required identifiers established in Contract Documents.
      2. Owner's, Architect's, and Contractor's names.
3. Discrete and consecutive RFI number, and descriptive subject/title.
4. Issue date, and requested reply date.
5. Reference to particular Contract Document(s) requiring additional information/interpretation. Identify pertinent drawing and detail number and/or specification section number, title, and paragraph(s).
6. Annotations: Field dimensions and/or description of conditions which have engendered the request.
7. Contractor's suggested resolution: A written and/or a graphic solution, to scale, is required in cases where clarification of coordination issues is involved, for example; routing, clearances, and/or specific locations of work shown diagrammatically in Contract Documents. If applicable, state the likely impact of the suggested resolution on Contract Time or the Contract Sum.

F. Attachments: Include sketches, coordination drawings, descriptions, photos, submittals, and other information necessary to substantiate the reason for the request.

G. RFI Log: Prepare and maintain a tabular log of RFIs for the duration of the project.
   1. Indicate current status of every RFI. Update log promptly and on a regular basis.
   2. Note dates of when each request is made, and when a response is received.
   3. Highlight items requiring priority or expedited response.
   4. Highlight items for which a timely response has not been received to date.
   5. Identify and include improper or frivolous RFIs.

H. Review Time: Architect will respond and return RFIs to Contractor within seven calendar days of receipt. For the purpose of establishing the start of the mandated response period, RFIs received after 12:00 noon will be considered as having been received on the following regular working day.
   1. Response period may be shortened or lengthened for specific items, subject to mutual agreement, and recorded in a timely manner in progress meeting minutes.

I. Responses: Content of answered RFIs will not constitute in any manner a directive or authorization to perform extra work or delay the project. If in Contractor's belief it is likely to lead to a change to Contract Sum or Contract Time, promptly issue a notice to this effect, and follow up with an appropriate Change Order request to Owner.
   1. Response may include a request for additional information, in which case the original RFI will be deemed as having been answered, and an amended one is to be issued forthwith. Identify the amended RFI with an R suffix to the original number.
   2. Do not extend applicability of a response to specific item to encompass other similar conditions, unless specifically so noted in the response.
   3. Upon receipt of a response, promptly review and distribute it to all affected parties, and update the RFI Log.
   4. Notify Architect within seven calendar days if an additional or corrected response is required by submitting an amended version of the original RFI, identified as specified above.

3.09 SUBMITTAL SCHEDULE

A. Submit to Architect for review a schedule for submittals in tabular format.
   1. Format schedule to allow tracking of status of submittals throughout duration of construction.
   2. Arrange information to include scheduled date for initial submittal, specification number and title, submittal category (for review or for information), description of item of work covered, and role and name of subcontractor.
   3. Account for time required for preparation, review, manufacturing, fabrication and delivery when establishing submittal delivery and review deadline dates.
      a. For assemblies, equipment, systems comprised of multiple components and/or requiring detailed coordination with other work, allow for additional time to make corrections or revisions to initial submittals, and time for their review.
3.10 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. Contractor shall review and stamp all submittals prior to forwarding to Architect. Submittals not stamped by the Contractor may be rejected.
C. After reviewing and stamping the submittals, the Contractor shall submit to Architect for review for the limited purpose of checking for compliance with information given and the design concept expressed in Contract Documents.
D. Samples will be reviewed for aesthetic, color, or finish selection.
E. After review, provide copies and distribute in accordance with SUBMITTAL PROCEDURES article below and for record documents purposes described in Section 01 7800 - Closeout Submittals.

3.11 SUBMITTALS FOR INFORMATION
A. When the following are specified in individual sections, submit them for information:
   1. Design data.
   2. Certificates.
   3. Test reports.
   4. Inspection reports.
   5. Manufacturer's instructions.
   6. Manufacturer's field reports.
   7. Other types indicated.
B. Submit for Architect's knowledge as contract administrator or for Owner.

3.12 SUBMITTALS FOR PROJECT CLOSEOUT
A. Submit Correction Punch List for Substantial Completion.
B. Submit Final Correction Punch List for Substantial Completion.
C. When the following are specified in individual sections, submit them at project closeout in compliance with requirements of Section 01 7800 - Closeout Submittals:
   1. Project record documents.
   2. Operation and maintenance data.
   3. Warranties.
D. Submit for Owner's benefit during and after project completion.

3.13 NUMBER OF COPIES OF SUBMITTALS
A. Electronic Documents: Submit one electronic copy in PDF format; an electronically-marked up file will be returned. Create PDFs at native size and right-side up; illegible files will be rejected.
B. Samples: Submit the number specified in individual specification sections; one of which will be retained by Architect.
   1. After review, produce duplicates.
   2. Retained samples will not be returned to Contractor unless specifically so stated.

3.14 SUBMITTAL PROCEDURES
A. General Requirements:
   1. Submit separate packages of submittals for review and submittals for information, when included in the same specification section.
   2. Sequentially identify each item. For revised submittals use original number and a sequential numerical suffix.
3. Identify: Project; Contractor; subcontractor or supplier; pertinent drawing and detail number; and specification section number and article/paragraph, as appropriate on each copy.

4. Apply Contractor's stamp, signed or initialed certifying that review, approval, verification of products required, field dimensions, adjacent construction work, and coordination of information is in accordance with the requirements of the work and Contract Documents.
   a. Submittals from sources other than the Contractor, or without Contractor's stamp will not be acknowledged, reviewed, or returned.

5. Deliver each submittal on date noted in submittal schedule, unless an earlier date has been agreed to by all affected parties, and is of the benefit to the project.

6. Schedule submittals to expedite the Project, and coordinate submission of related items.
   a. For each submittal for review, allow 15 days excluding delivery time to and from the Contractor.
   b. For sequential reviews involving Architect's consultants, Owner, or another affected party, allow an additional 7 days.

7. Identify variations from Contract Documents and product or system limitations that may be detrimental to successful performance of the completed work.

8. Provide space for Contractor and Architect review stamps.

9. When revised for resubmission, identify all changes made since previous submission.

10. Incomplete submittals will not be reviewed, unless they are partial submittals for distinct portion(s) of the work, and have received prior approval for their use.

11. Submittals not requested will be recognized, and will be returned "Not Reviewed".

B. Product Data Procedures:
   1. Submit only information required by individual specification sections.
   2. Collect required information into a single submittal.
   3. Submit concurrently with related shop drawing submittal.
   4. Do not submit (Material) Safety Data Sheets for materials or products.

C. Shop Drawing Procedures:
   1. Prepare accurate, drawn-to-scale, original shop drawing documentation by interpreting Contract Documents and coordinating related work.
   2. Generic, non-project-specific information submitted as shop drawings do not meet the requirements for shop drawings.

D. Samples Procedures:
   1. Transmit related items together as single package.
   2. Identify each item to allow review for applicability in relation to shop drawings showing installation locations.

3.15 SUBMITTAL REVIEW

A. Submittals for Review: Architect will review each submittal, and approve, or take other appropriate action.

B. Submittals for Information: Architect will acknowledge receipt and review. See below for actions to be taken.

C. Architect's actions will be reflected by marking each returned submittal using virtual stamp on electronic submittals.

D. Architect's and consultants' actions on items submitted for review:
   1. Authorizing purchasing, fabrication, delivery, and installation:
      a. "Approved as Noted, Resubmission not required", or language with same legal meaning.
         1) At Contractor's option, submit corrected item, with review notations acknowledged and incorporated.
      b. "Approved as Noted, Resubmit for Record", or language with same legal meaning.
2. Not Authorizing fabrication, delivery, and installation:
   a. "Revise and Resubmit".
      1) Resubmit revised item, with review notations acknowledged and incorporated.
   b. "Rejected".
      1) Submit item complying with requirements of Contract Documents.

E. Architect's and consultants' actions on items submitted for information:
1. Items for which no action was taken:
   a. "Received" - to notify the Contractor that the submittal has been received for record only.

2. Items for which action was taken:
   a. "Reviewed" - no further action is required from Contractor.

END OF SECTION
SECTION 01 3553
SECURITY PROCEDURES

PART 1 GENERAL
1.01 SECTION INCLUDES
   A. Security measures including formal security program, entry control, personnel identification, guard service, and miscellaneous restrictions.

1.02 RELATED REQUIREMENTS
   A. Section 01 1000 - Summary: use of premises and occupancy.

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. Contractor shall control entrance of persons and vehicles related to Owner's operations.
   C. Coordinate access of Owner's personnel to site in coordination with Owner's security forces.

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

END OF SECTION
PART 1 GENERAL

1.01 SECTION INCLUDES

A. Submittals.
B. Quality assurance.
C. References and standards.
D. Testing and inspection agencies and services.
E. Control of installation.
F. Mock-ups.
G. Tolerances.
H. Manufacturers' field services.
I. Defect Assessment.

1.02 RELATED REQUIREMENTS

A. Section 01 2100 - Allowances: Allowance for payment of testing services.
B. Section 01 4216 - Definitions.

1.03 REFERENCE STANDARDS


1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Design Data: Submit for Architect's knowledge as contract administrator for the limited purpose of assessing compliance with information given and the design concept expressed in the Contract Documents, or for Owner's information.
C. Test Reports: After each test/inspection, promptly submit two copies of report to Architect and to Contractor.
   1. Include:
      a. Date issued.
      b. Project title and number.
      c. Name of inspector.
      d. Date and time of sampling or inspection.
      e. Identification of product and specifications section.
      f. Location in the Project.
      g. Type of test/inspection.
      h. Date of test/inspection.
      i. Results of test/inspection.
      j. Compliance with Contract Documents.
k. When requested by Architect, provide interpretation of results.

2. Test report submittals are for Architect's knowledge as contract administrator for the limited purpose of assessing compliance with information given and the design concept expressed in the Contract Documents, or for Owner's information.

D. Certificates: When specified in individual specification sections, submit certification by the manufacturer and Contractor or installation/application subcontractor to Architect, in quantities specified for Product Data.
   1. Indicate material or product complies with or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.
   2. Certificates may be recent or previous test results on material or product, but must be acceptable to Architect.

E. 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.

F. Manufacturer's Field Reports: Submit reports for Architect's benefit as contract administrator or for Owner.
   1. Submit report in duplicate within 30 days of observation to Architect for information.
   2. Submit for information for the limited purpose of assessing compliance with information given and the design concept expressed in the Contract Documents.

1.05 QUALITY ASSURANCE

A. Testing Agency Qualifications:
   1. Prior to start of work, submit agency name, address, and telephone number, and names of full time registered Engineer and responsible officer.
   2. Qualification Statement: Provide documentation showing testing laboratory is accredited under IAS AC89.

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. Comply with reference standard of date of issue current on date of Contract Documents, except where a specific date is established by applicable code.

C. Obtain copies of standards where required by product specification sections.

D. Maintain copy at project site during submittals, planning, and progress of the specific work, until Substantial Completion.

E. Should specified reference standards conflict with Contract Documents, request clarification from Architect before proceeding.

F. Neither the contractual relationships, duties, or responsibilities of the parties in Contract nor those of Architect shall be altered from Contract Documents by mention or inference otherwise in any reference document.

1.07 TESTING AND INSPECTION AGENCIES AND SERVICES

A. Owner will employ services of an independent testing agency to perform certain specified testing; payment for cost of services will be derived from allowance specified in Section 01 2100; see Section 01 2100 and applicable sections for description of services included in allowance.

B. Owner will employ and pay for services of an independent testing agency to perform other specified testing.

C. Contractor shall employ and pay for services of an independent testing agency to perform other specified testing.
D. As indicated in individual specification sections, Owner or Contractor shall employ and pay for services of an independent testing agency to perform other specified testing.

E. Employment of agency in no way relieves Contractor of obligation to perform Work in accordance with requirements of Contract Documents.

F. Contractor Employed Agency:
   1. Laboratory: Authorized to operate in Utah.
   2. Laboratory Staff: Maintain a full time registered Engineer on staff to review services.
   3. Testing Equipment: Calibrated at reasonable intervals either by NIST or using an NIST established Measurement Assurance Program, under a laboratory measurement quality assurance program.

PART 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. Accepted mock-ups establish the standard of quality the Architect will use to judge the Work.
   B. Notify Architect fifteen (15) working days in advance of dates and times when mock-ups will be constructed.
   C. Tests shall be performed under provisions identified in this section and identified in the respective product specification sections.
   D. Assemble and erect specified items with specified attachment and anchorage devices, flashings, seals, and finishes.
   E. Accepted mock-ups shall be a comparison standard for the remaining Work.
   F. Where mock-up has been accepted by Architect and is specified in product specification sections to be removed, protect mock-up throughout construction, remove mock-up and clear area when directed to do so by Architect.

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. Testing Agency Duties:
2. Perform specified sampling and testing of products in accordance with specified standards.
3. Ascertained compliance of materials and mixes with requirements of Contract Documents.
4. Perform additional tests and inspections required by Architect.
5. Submit reports of all tests/inspections specified.

B. Limits on Testing/Inspection Agency Authority:
1. Agency may not release, revoke, alter, or enlarge on requirements of Contract Documents.
2. Agency may not approve or accept any portion of the Work.
3. Agency may not assume any duties of Contractor.
4. Agency has no authority to stop the Work.

C. Contractor Responsibilities:
1. Deliver to agency at designated location, adequate samples of materials proposed to be used that require testing, along with proposed mix designs.
2. Cooperate with laboratory personnel, and provide access to the Work and to manufacturers' facilities.
3. Provide incidental labor and facilities:
   a. To provide access to Work to be tested/inspected.
   b. To obtain and handle samples at the site or at source of Products to be tested/inspected.
   c. To facilitate tests/inspections.
   d. To provide storage and curing of test samples.
4. Notify Architect and laboratory 24 hours prior to expected time for operations requiring testing/inspection services.
5. Employ services of an independent qualified testing laboratory and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.
6. Arrange with Owner's agency and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.

D. Re-testing required because of non-compliance with specified requirements shall be performed by the same agency on instructions by Architect.

E. Re-testing required because of non-compliance with specified requirements shall be paid for by Contractor.

3.05 MANUFACTURERS' FIELD SERVICES
A. When specified in individual specification sections, require material or product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship, start-up of equipment, test, adjust, and balance equipment as applicable, and to initiate instructions when necessary.

B. Report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.

3.06 DEFECT ASSESSMENT
A. Replace Work or portions of the Work not complying with specified requirements.
B. If, in the opinion of Owner, it is not practical to remove and replace the work, Owner will direct an appropriate remedy or adjust payment.

END OF SECTION
SECTION 01 4216
DEFINITIONS

PART 1 GENERAL

1.01 SUMMARY
A. This section supplements the definitions contained in the General Conditions.
B. Other definitions are included in individual specification sections.

1.02 DEFINITIONS
A. Furnish: To supply, deliver, unload, and inspect for damage.
B. Install: To unpack, assemble, erect, apply, place, finish, cure, protect, clean, start up, and make ready for use.
C. Product: Material, machinery, components, equipment, fixtures, and systems forming the work result. Not materials or equipment used for preparation, fabrication, conveying, or erection and not incorporated into the work result. Products may be new, never before used, or re-used materials or equipment.
D. Project Manual: The book-sized volume that includes the procurement requirements (if any), the contracting requirements, and the specifications.
E. Provide: To furnish and install.
F. Supply: Same as Furnish.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION
PART 1  GENERAL

1.01  SECTION INCLUDES
   A. Temporary utilities.
   B. Temporary telecommunications services.
   C. Temporary sanitary facilities.
   D. Temporary Controls: Barriers, enclosures, and fencing.
   E. Security requirements.
   F. Waste removal facilities and services.
   G. Project identification sign.

1.02  TEMPORARY UTILITIES - SEE SECTION 01 5100
   A. Owner will provide the following:
      1. Electrical power and metering, consisting of connection to existing facilities.
      2. Water supply, consisting of connection to existing facilities.
   B. Provide and pay for all electrical power, lighting, water, heating and cooling, and ventilation required for construction purposes.
   C. Existing facilities may be used.
   D. Use trigger-operated nozzles for water hoses, to avoid waste of water.

1.03  TELECOMMUNICATIONS SERVICES
   A. Provide, maintain, and pay for telecommunications services to field office at time of project mobilization.
   B. Telecommunications services shall include:

1.04  TEMPORARY SANITARY FACILITIES
   A. Provide and maintain required facilities and enclosures. Provide at time of project mobilization.
   B. Use of existing facilities located at the job site is not permitted.
   C. Maintain daily in clean and sanitary condition.

1.05  BARRIERS
   A. Provide barriers to prevent unauthorized entry to construction areas, to prevent access to areas that could be hazardous to workers or the public, to allow for owner's use of site and to protect existing facilities and adjacent properties from damage from construction operations and demolition.
   B. Provide barricades and covered walkways required by governing authorities for public rights-of-way and for public access to existing building.
   C. Provide protection for plants designated to remain. Replace damaged plants.
   D. Protect non-owned vehicular traffic, stored materials, site, and structures from damage.
   E. Traffic Controls: Provide during regular school hours and other school events .

1.06  FENCING
   A. Construction: Contractor's option.
   B. Provide 6 foot (1.8 m) high fence around construction site; equip with vehicular and pedestrian gates with locks.

1.07  EXTERIOR ENCLOSURES
   A. Provide temporary insulated weather tight closure of exterior openings to accommodate acceptable working conditions and protection for Products, to allow for temporary heating and
1.08 INTERIOR ENCLOSURES
   A. Provide temporary partitions and ceilings as indicated to separate work areas from
      Owner-occupied areas, to prevent penetration of dust and moisture into Owner-occupied areas,
      and to prevent damage to existing materials and equipment.
   B. Construction: Framing and reinforced polyethylene sheet materials with closed joints and
      sealed edges at intersections with existing surfaces.

1.09 SECURITY - SEE SECTION 01 3553
   A. Provide security and facilities to protect Work, existing facilities, and Owner's operations from
      unauthorized entry, vandalism, or theft.
   B. Coordinate with Owner's security program.

1.10 VEHICULAR ACCESS AND PARKING - SEE SECTION 01 5500
   A. Comply with regulations relating to use of streets and sidewalks, access to emergency facilities,
      and access for emergency vehicles.
   B. Coordinate access and haul routes with governing authorities and Owner.
   C. Provide and maintain access to fire hydrants, free of obstructions.
   D. Provide means of removing mud from vehicle wheels before entering streets.
   E. Provide temporary parking areas to accommodate construction personnel. When site space is
      not adequate, provide additional off-site parking.

1.11 WASTE REMOVAL
   A. 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 periodically.
   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.

1.12 PROJECT IDENTIFICATION
   A. Provide project identification sign of design and construction.
   B. Erect on site at location as directed by Owner.
   C. No other signs are allowed without Owner permission except those required by law.

1.13 FIELD OFFICES - SEE SECTION 01 5213
   A. Office: Weathertight, with lighting, electrical outlets, heating, cooling equipment, and equipped
      with drawing display table.
   B. Provide space for Project meetings, with table and chairs to accommodate 6 persons.

1.14 REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS
   A. Remove temporary utilities, equipment, facilities, materials, prior to Final Application for
      Payment inspection.
   B. Remove underground installations to a minimum depth of 2 feet (600 mm). Grade site as
      indicated.
   C. Clean and repair damage caused by installation or use of temporary work.
   D. Restore existing facilities used during construction to original condition.
PART 2 PRODUCTS - NOT USED
PART 3 EXECUTION - NOT USED

END OF SECTION
SECTION 01 5100
TEMPORARY UTILITIES

PART 1  GENERAL

1.01  SECTION INCLUDES
   A. Temporary Utilities: Provision of electricity, lighting, heat, ventilation, and water.

1.02  REFERENCE STANDARDS

1.03  TEMPORARY ELECTRICITY
   A. Cost: By Owner.
   B. Connect to Owner’s existing power service.
      1. Exercise measures to conserve energy.
   C. Provide temporary electric feeder from existing building electrical service at location as directed.
   D. Complement existing power service capacity and characteristics as required.
   E. Provide power outlets for construction operations, with branch wiring and distribution boxes located at each floor. Provide flexible power cords as required.
   F. Provide main service disconnect and over-current protection at convenient location and meter.
   G. Permanent convenience receptacles may be utilized during construction.
   H. Provide adequate distribution equipment, wiring, and outlets to provide single phase branch circuits for power and lighting.

1.04  TEMPORARY LIGHTING FOR CONSTRUCTION PURPOSES
   A. Provide and maintain LED, compact fluorescent, or high-intensity discharge lighting as suitable for the application for construction operations in accordance with requirements of 29 CFR 1926 and authorities having jurisdiction.
   B. Provide branch wiring from power source to distribution boxes with lighting conductors, pigtails, and lamps as required.
   C. Maintain lighting and provide routine repairs.

1.05  TEMPORARY HEATING
   A. Cost of Energy: By Owner.
   B. Provide heating devices and heat as needed to maintain specified conditions for construction operations.
   C. Maintain minimum ambient temperature of 50 degrees F (10 degrees C) in areas where construction is in progress, unless indicated otherwise in specifications.

1.06  TEMPORARY VENTILATION
   A. Utilize existing ventilation equipment. Extend and supplement equipment with temporary fan units as required to maintain clean air for construction operations.

1.07  TEMPORARY WATER SERVICE
   A. Cost of Water Used: By Owner.
   B. Provide and maintain suitable quality water service for construction operations at time of project mobilization.
   C. Connect to existing water source.
      1. Exercise measures to conserve water.
   D. Extend branch piping with outlets located so water is available by hoses with threaded connections. Provide temporary pipe insulation to prevent freezing.
PART 2 PRODUCTS - NOT USED
PART 3 EXECUTION - NOT USED

END OF SECTION
SECTION 01 5213
FIELD OFFICES AND SHEDS

PART 1  GENERAL

1.01  SECTION INCLUDES
  A. Temporary field offices for use of Contractor.

1.02  RELATED REQUIREMENTS

1.03  USE OF EXISTING FACILITIES
  A. Existing facilities shall not be used for field offices.

1.04  USE OF PERMANENT FACILITIES
  A. When permanent facilities are enclosed with operable utilities, relocate offices into building, with written agreement of Owner, and remove temporary buildings.

PART 2  PRODUCTS

2.01  CONSTRUCTION
  A. Portable or mobile buildings, or buildings constructed with floors raised above ground, securely fixed to foundations, with steps and landings at entrance doors.
  B. Construction: Structurally sound, secure, weather tight enclosures for office. Maintain during progress of Work; remove when no longer needed.
  C. Fire Extinguishers: Appropriate type fire extinguisher at each office.

2.02  ENVIRONMENTAL CONTROL
  A. Heating, Cooling, and Ventilating: Automatic equipment to maintain comfort conditions.

2.03  CONTRACTOR OFFICE AND FACILITIES
  A. Size: For Contractor's needs and to provide space for project meetings.
  B. Other Furnishings: Contractor's option.
  C. Equipment: Six adjustable band protective helmets for visitors, one 10 inch (250 mm) outdoor weather thermometer.

PART 3  EXECUTION

3.01  PREPARATION
  A. Fill and grade sites for temporary structures to provide drainage away from buildings.

3.02  INSTALLATION
  A. Install office spaces ready for occupancy 15 days after date fixed in Notice to Proceed.

3.03  MAINTENANCE AND CLEANING
  A. Maintain approach walks free of mud, water, and snow.

3.04  REMOVAL
  A. At completion of Work remove buildings, foundations, utility services, and debris. Restore areas.

END OF SECTION
SECTION 01 5713
TEMPORARY EROSION AND SEDIMENT CONTROL

PART 1  GENERAL

1.01  SECTION INCLUDES

A. Prevention of erosion due to construction activities.
B. Prevention of sedimentation of waterways, open drainage ways, and storm and sanitary sewers due to construction activities.
C. Restoration of areas eroded due to insufficient preventive measures.
D. Performance bond.
E. Compensation of Owner for fines levied by authorities having jurisdiction due to non-compliance by Contractor.

1.02  RELATED REQUIREMENTS

A. Section 32 1123 - Aggregate Base Courses: Temporary and permanent roadways.

1.03  REFERENCE STANDARDS


1.04  PERFORMANCE REQUIREMENTS

A. Comply with requirements of State of Utah Erosion and Sedimentation Control Manual.
B. Develop and follow an Erosion and Sedimentation Prevention Plan and submit periodic inspection reports.
C. Do not begin clearing, grading, or other work involving disturbance of ground surface cover until applicable permits have been obtained; furnish all documentation required to obtain applicable permits.
D. Provide to Owner a Performance Bond covering erosion and sedimentation preventive measures only, in an amount equal to 100 percent of the cost of erosion and sedimentation control work.
E. Timing: Put preventive measures in place as soon as possible after disturbance of surface cover and before precipitation occurs.
F. Storm Water Runoff: Control increased storm water runoff due to disturbance of surface cover due to construction activities for this project.
   1. Prevent runoff into storm and sanitary sewer systems, including open drainage channels, in excess of actual capacity or amount allowed by authorities having jurisdiction, whichever is less.
   2. Anticipate runoff volume due to the most extreme short term and 24-hour rainfall events that might occur in 25 years.
G. Erosion On Site: Minimize wind, water, and vehicular erosion of soil on project site due to construction activities for this project.
1. Control movement of sediment and soil from temporary stockpiles of soil.
2. Prevent development of ruts due to equipment and vehicular traffic.
3. If erosion occurs due to non-compliance with these requirements, restore eroded areas at no cost to Owner.

H. Erosion Off Site: Prevent erosion of soil and deposition of sediment on other properties caused by water leaving the project site due to construction activities for this project.
   1. Prevent windblown soil from leaving the project site.
   2. Prevent tracking of mud onto public roads outside site.
   3. Prevent mud and sediment from flowing onto sidewalks and pavements.
   4. If erosion occurs due to non-compliance with these requirements, restore eroded areas at no cost to Owner.

I. Sedimentation of Waterways On Site: Prevent sedimentation of waterways on the project site, including rivers, streams, lakes, ponds, open drainage ways, storm sewers, and sanitary sewers.
   1. If sedimentation occurs, install or correct preventive measures immediately at no cost to Owner; remove deposited sediments; comply with requirements of authorities having jurisdiction.
   2. If sediment basins are used as temporary preventive measures, pump dry and remove deposited sediment after each storm.

J. Sedimentation of Waterways Off Site: Prevent sedimentation of waterways off the project site, including rivers, streams, lakes, ponds, open drainage ways, storm sewers, and sanitary sewers.
   1. If sedimentation occurs, install or correct preventive measures immediately at no cost to Owner; remove deposited sediments; comply with requirements of authorities having jurisdiction.

K. Open Water: Prevent standing water that could become stagnant.

L. Maintenance: Maintain temporary preventive measures until permanent measures have been established.

1.05 SUBMITTALS

A. Erosion and Sedimentation Control Plan:
   1. Include:
      a. Site plan identifying soils and vegetation, existing erosion problems, and areas vulnerable to erosion due to topography, soils, vegetation, or drainage.
      b. Site plan showing grading; new improvements; temporary roads, traffic accesses, and other temporary construction; and proposed preventive measures.
      c. Where extensive areas of soil will be disturbed, include storm water flow and volume calculations, soil loss predictions, and proposed preventive measures.
      d. Schedule of temporary preventive measures, in relation to ground disturbing activities.
      e. Other information required by law.
      f. Format required by law is acceptable, provided any additional information specified is also included.
   2. Obtain the approval of the Plan by authorities having jurisdiction.
   3. Obtain the approval of the Plan by Owner.

B. Certificate: Mill certificate for silt fence fabric attesting that fabric and factory seams comply with specified requirements, signed by legally authorized official of manufacturer; indicate actual minimum average roll values; identify fabric by roll identification numbers.

C. Inspection Reports: Submit report of each inspection; identify each preventive measure, indicate condition, and specify maintenance or repair required and accomplished.

PART 2 PRODUCTS

2.01 MATERIALS

A. Bales: Air dry, rectangular straw bales.
1. Cross Section: 14 by 18 inches (350 by 450 mm), minimum.
2. Bindings: Wire or string, around long dimension.

B. Bale Stakes: One of the following, minimum 3 feet (1 m) long:
1. Steel U- or T-section, with minimum mass of 1.33 pound per linear foot (1.98 kg per linear m).
2. Wood, 2 by 2 inches (50 by 50 mm) in cross section.

C. Silt Fence Fabric: Polypropylene geotextile resistant to common soil chemicals, mildew, and insects; non-biodegradable; in longest lengths possible; fabric including seams with the following minimum average roll lengths:
1. Average Opening Size: 30 U.S. Std. Sieve (0.600 mm), maximum, when tested in accordance with ASTM D4751.
2. Permittivity: 0.05 sec^-1, minimum, when tested in accordance with ASTM D4491.
3. Ultraviolet Resistance: Retaining at least 70 percent of tensile strength, when tested in accordance with ASTM D4355/D4355M after 500 hours exposure.
4. Tensile Strength: 100 pounds-force (450 N), minimum, in cross-machine direction; 124 pounds-force (550 N), minimum, in machine direction; when tested in accordance with ASTM D4632/D4632M.
5. Elongation: 15 to 30 percent, when tested in accordance with ASTM D4632/D4632M.
6. Tear Strength: 55 pounds-force (245 N), minimum, when tested in accordance with ASTM D4533/D4533M.
7. Color: Manufacturer's standard, with embedment and fastener lines preprinted.

D. Silt Fence Posts: One of the following, minimum 5 feet (1500 mm) long:

E. Gravel: See Section 32 1123 for aggregate.

PART 3 EXECUTION

3.01 EXAMINATION
A. Examine site and identify existing features that contribute to erosion resistance; maintain such existing features to greatest extent possible.

3.02 PREPARATION
A. Schedule work so that soil surfaces are left exposed for the minimum amount of time.

3.03 SCOPE OF PREVENTIVE MEASURES
A. In all cases, if permanent erosion resistant measures have been installed temporary preventive measures are not required.

B. Construction Entrances: Traffic-bearing aggregate surface.
1. Width: As required; 20 feet (7 m), minimum.
2. Length: 50 feet (16 m), minimum.
3. Provide at each construction entrance from public right-of-way.
4. Where necessary to prevent tracking of mud onto right-of-way, provide wheel washing area out of direct traffic lane, with drain into sediment trap or basin.

C. Linear Sediment Barriers: Made of silt fences.
1. Provide linear sediment barriers:
   a. Along downhill perimeter edge of disturbed areas, including soil stockpiles.
2. Space sediment barriers with the following maximum slope length upslope from barrier:
   a. Slope of Less Than 2 Percent: 100 feet (30 m).
   b. Slope Between 2 and 5 Percent: 75 feet (23 m).
   c. Slope Between 5 and 10 Percent: 50 feet (15 m).
   d. Slope Between 10 and 20 Percent: 25 feet (7.5 m).
   e. Slope Over 20 Percent: 15 feet (4.5 m).

D. Storm Drain Curb Inlet Sediment Trap: Protect each curb inlet using one of the following measures:
1. Filter fabric wrapped around hollow concrete blocks blocking entire inlet face area; use one piece of fabric wrapped at least 1-1/2 times around concrete blocks and secured to prevent dislodging; orient cores of blocks so runoff passes into inlet.
2. Straw bale row blocking entire inlet face area; anchor into pavement.

E. Storm Drain Drop Inlet Sediment Traps: As detailed on drawings.

F. Temporary Splash Pads: Stone aggregate over filter fabric; size to suit application; provide at downspout outlets and storm water outlets.

G. Soil Stockpiles: Protect using one of the following measures:
   1. Cover with polyethylene film, secured by placing soil on outer edges.
   2. Cover with mulch at least 4 inches (100 mm) thickness of pine needles, sawdust, bark, wood chips, or shredded leaves, or 6 inches (150 mm) of straw or hay.

H. Mulching: Use only for areas that may be subjected to erosion for less than 6 months.

I. Temporary Seeding: Use where temporary vegetated cover is required.

3.04 INSTALLATION

A. Traffic-Bearing Aggregate Surface:
   1. Excavate minimum of 6 inches (150 mm).
   2. Place geotextile fabric full width and length, with minimum 12 inch (300 mm) overlap at joints.
   3. Place and compact at least 6 inches (150 mm) of 1 1/2 to 3 1/2 inch (40 to 90 mm) diameter stone.

B. Silt Fences:
   1. Store and handle fabric in accordance with ASTM D4873/D4873M.
   2. Where slope gradient is less than 3:1 or barriers will be in place less than 6 months, use nominal 16 inch (405 mm) high barriers with minimum 36 inch (905 mm) long posts spaced at 6 feet (1830 mm) maximum, with fabric embedded at least 4 inches (100 mm) in ground.
   3. Where slope gradient is steeper than 3:1 or barriers will be in place over 6 months, use nominal 28 inch (710 mm) high barriers, minimum 48 inch (1220 mm) long posts spaced at 6 feet (1830 mm) maximum, with fabric embedded at least 6 inches (150 mm) in ground.
   4. Where slope gradient is steeper than 3:1 and vertical height of slope between barriers is more than 20 feet (6 m), use nominal 32 inch (810 mm) high barriers with woven wire reinforcement and steel posts spaced at 4 feet (1220 mm) maximum, with fabric embedded at least 6 inches (150 mm) in ground.
   5. Install with top of fabric at nominal height and embedment as specified.
   6. Do not splice fabric width; minimize splices in fabric length; splice at post only, overlapping at least 18 inches (460 mm), with extra post.
   7. Wherever runoff will flow around end of barrier or over the top, provide temporary splash pad or other outlet protection; at such outlets in the run of the barrier, make barrier not more than 12 inches (300 mm) high with post spacing not more than 4 feet (1220 mm).

C. Straw Bale Rows:
   1. Install bales in continuous rows with ends butting tightly, with one bale at each end of row turned uphill.
   2. Install bales so that bindings are not in contact with the ground.
   3. Embed bales at least 4 inches (100 mm) in the ground.
   4. Anchor bales with at least two stakes per bale, driven at least 18 inches (450 mm) into the ground; drive first stake in each bale toward the previously placed bale to force bales together.
   5. Fill gaps between ends of bales with loose straw wedged tightly.
   6. Place soil excavated for trench against bales on the upslope side of the row, compacted.
3.05 MAINTENANCE
   A. Inspect preventive measures weekly, within 24 hours after the end of any storm that produces 0.5 inches (13 mm) or more rainfall at the project site, and daily during prolonged rainfall.
   B. Repair deficiencies immediately.
   C. Silt Fences:
      1. Promptly replace fabric that deteriorates unless need for fence has passed.
      2. Remove silt deposits that exceed one-third of the height of the fence.
      3. Repair fences that are undercut by runoff or otherwise damaged, whether by runoff or other causes.
   D. Straw Bale Rows:
      1. Promptly replace bales that fall apart or otherwise deteriorate unless need has passed.
      2. Remove silt deposits that exceed one-half of the height of the bales.
      3. Repair bale rows that are undercut by runoff or otherwise damaged, whether by runoff or other causes.
   E. Clean out temporary sediment control structures weekly and relocate soil on site.
   F. Place sediment in appropriate locations on site; do not remove from site.

3.06 CLEAN UP
   A. Remove temporary measures after permanent measures have been installed, unless permitted to remain by Architect.
   B. Clean out temporary sediment control structures that are to remain as permanent measures.
   C. Where removal of temporary measures would leave exposed soil, shape surface to an acceptable grade and finish to match adjacent ground surfaces.

END OF SECTION
SECTION 01 6000
PRODUCT REQUIREMENTS

PART 1 GENERAL

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

1.02 RELATED REQUIREMENTS
A. Section 01 1000 - Summary: Lists of products to be removed from existing building.
B. Section 01 2500 - Substitution Procedures: Substitutions made during procurement and/or construction phases.
C. Section 01 6116 - Volatile Organic Compound (VOC) Content Restrictions: Requirements for VOC-restricted product categories.
D. Section 01 7419 - Construction Waste Management and Disposal: Waste disposal requirements potentially affecting product selection, packaging and substitutions.

1.03 REFERENCE STANDARDS

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.

1.05 QUALITY ASSURANCE
A. Recycled Content: Determine percentage of post-consumer and pre-consumer (post-industrial) content separately, using the guidelines contained in 16 CFR 260.13.
   1. Previously used, reused, refurbished, and salvaged products are not considered recycled.
   2. Wood fabricated from timber abandoned in transit to original mill is considered reused, not recycled.
   3. Determine percentage of recycled content of any item by dividing the weight of recycled content in the item by the total weight of materials in the item.
   4. Determine value of recycled content of each item separately, by multiplying the content percentage by the value of the item.
5. Acceptable Evidence:
   a. For percentage of recycled content, information from manufacturer.
   b. For cost, Contractor's cost data.

B. Reused Products: Materials and equipment previously used in this or other construction, salvaged and refurbished as specified.
   1. Wood fabricated from timber abandoned in transit after harvesting is considered reused, not recycled.
   2. Acceptable Evidence: Information about the origin or source, from Contractor or supplier.

PART 2 PRODUCTS

2.01 EXISTING PRODUCTS
   A. Do not use materials and equipment removed from existing premises unless specifically required or permitted by Contract Documents.
   B. Unforeseen historic items encountered remain the property of the Owner; notify Owner promptly upon discovery; protect, remove, handle, and store as directed by Owner.
   C. Existing materials and equipment indicated to be removed, but not to be re-used, relocated, reinstalled, delivered to the Owner, or otherwise indicated as to remain the property of the Owner, become the property of the Contractor; remove from site.

2.02 NEW PRODUCTS
   A. Provide new products unless specifically required or permitted by Contract Documents.
   B. Use of products having any of the following characteristics is not permitted:
      1. Containing lead, cadmium, or asbestos.
   C. Where other criteria are met, Contractor shall give preference to products that:
      1. If used on interior, have lower emissions, as defined in Section 01 6116.
      2. If wet-applied, have lower VOC content, as defined in Section 01 6116.
      3. Are extracted, harvested, and/or manufactured closer to the location of the project.
      4. Have longer documented life span under normal use.
      5. Result in less construction waste. See Section 01 7419

2.03 PRODUCT OPTIONS
   A. Products Specified by Reference Standards or by Description Only: Use any product meeting those standards or description.
   B. Products Specified by Naming One or More Manufacturers: Use a product of one of the manufacturers named and meeting specifications, no options or substitutions allowed.
   C. Products Specified by Naming One or More Manufacturers with a Provision for Substitutions: Submit a request for substitution for any manufacturer not named.

2.04 MAINTENANCE MATERIALS
   A. Furnish extra materials, spare parts, tools, and software of types and in quantities specified in individual specification sections.
   B. Deliver and place in location as directed; obtain receipt prior to final payment.

PART 3 EXECUTION

3.01 SUBSTITUTION LIMITATIONS
   A. See Section 01 2500 - Substitution Procedures.

3.02 OWNER-SUPPLIED PRODUCTS
   A. 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.

B. 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. Package products for shipment in manner to prevent damage; for equipment, package to avoid loss of factory calibration.
   B. If special precautions are required, attach instructions prominently and legibly on outside of packaging.
   C. Coordinate schedule of product delivery to designated prepared areas in order to minimize site storage time and potential damage to stored materials.
   D. Transport and handle products in accordance with manufacturer’s instructions.
   E. Transport materials in covered trucks to prevent contamination of product and littering of surrounding areas.
   F. Promptly inspect shipments to ensure that products comply with requirements, quantities are correct, and products are undamaged.
   G. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage, and to minimize handling.
   H. Arrange for the return of packing materials, such as wood pallets, where economically feasible.

3.04 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. See Section 01 7419.
   B. Store and protect products in accordance with manufacturers' instructions.
   C. Store with seals and labels intact and legible.
   D. Store sensitive products in weathertight, climate-controlled enclosures in an environment favorable to product.
   E. For exterior storage of fabricated products, place on sloped supports above ground.
   F. Protect products from damage or deterioration due to construction operations, weather, precipitation, humidity, temperature, sunlight and ultraviolet light, dirt, dust, and other contaminants.
   G. Comply with manufacturer's warranty conditions, if any.
   H. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of products.
   I. Prevent contact with material that may cause corrosion, discoloration, or staining.
   J. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.
   K. Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.

END OF SECTION
SECTION 01 6116
VOLATILE ORGANIC COMPOUND (VOC) CONTENT RESTRICTIONS

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Requirements for Indoor-Emissions-Restricted products.
B. Requirements for VOC-Content-Restricted products.

1.02 RELATED REQUIREMENTS
A. Section 01 3000 - Administrative Requirements: Submittal procedures.
B. Section 01 6000 - Product Requirements: Fundamental product requirements, substitutions and product options, delivery, storage, and handling.

1.03 DEFINITIONS
A. Interior of Building: Anywhere inside the exterior weather barrier.

1.04 REFERENCE STANDARDS
A. Utah Administrative Code - R307 Environmental Quality, Air Quality; Rule R307-357, Consumer Products.

1.05 SUBMITTALS
A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Product Data: For each VOC-restricted product used in the project, submit evidence of compliance.

PART 2 PRODUCTS

2.01 MATERIALS
A. All Products: Comply with the most stringent of federal, State, and local requirements, or these specifications.

PART 3 EXECUTION

3.01 FIELD QUALITY CONTROL
A. Owner reserves the right to reject non-compliant products, whether installed or not, and require their removal and replacement with compliant products at no extra cost to Owner.
B. Additional costs to restore indoor air quality due to installation of non-compliant products will be borne by Contractor.

END OF SECTION
SECTION 01 7000
EXECUTION AND CLOSEOUT REQUIREMENTS

PART 1 GENERAL
1.01 SECTION INCLUDES
A. Examination, preparation, and general installation procedures.
B. Requirements for alterations work, including selective demolition.
C. Pre-installation meetings.
D. Cutting and patching.
E. Surveying for laying out the work.
F. Cleaning and protection.
G. Starting of systems and equipment.
H. Demonstration and instruction of Owner personnel.
I. Closeout procedures, including Contractor's Correction Punch List, except payment procedures.
J. General requirements for maintenance service.

1.02 RELATED REQUIREMENTS
A. Section 01 1000 - Summary: Limitations on working in existing building; continued occupancy; work sequence; identification of salvaged and relocated materials.
B. Section 01 7800 - Closeout Submittals: Project record documents, operation and maintenance data, warranties, and bonds.
C. Section 02 4100 - Demolition: Demolition of whole structures and parts thereof; site utility demolition.
D. Section 07 8400 - Firestopping.
E. Individual Product Specification Sections:
   1. Advance notification to other sections of openings required in work of those sections.

1.03 REFERENCE STANDARDS

1.04 SUBMITTALS
A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Survey work: Submit name, address, and telephone number of Surveyor before starting survey work.
   1. On request, submit documentation verifying accuracy of survey work.
   2. Submit a copy of site drawing signed by the Land Surveyor, that the elevations and locations of the work are in compliance with Contract Documents.
   3. Submit surveys and survey logs for the project record.
C. Cutting and Patching: Submit written request in advance of cutting or alteration that affects:
   1. Structural integrity of any element of Project.
   2. Integrity of weather exposed or moisture resistant element.
   3. Efficiency, maintenance, or safety of any operational element.
   5. Work of Owner or separate Contractor.
D. Project Record Documents: Accurately record actual locations of capped and active utilities.

1.05 QUALIFICATIONS
A. For surveying work, employ a land surveyor registered in Utah and acceptable to Architect. Submit evidence of surveyor's Errors and Omissions insurance coverage in the form of an
Insurance Certificate. Employ only individual(s) trained and experienced in collecting and recording accurate data relevant to ongoing construction activities.

1.06 PROJECT CONDITIONS
A. Use of explosives is not permitted.
B. Grade site to drain. Maintain excavations free of water. Provide, operate, and maintain pumping equipment.
C. Protect site from puddling or running water. Provide water barriers as required to protect site from soil erosion.
D. Ventilate enclosed areas to assist cure of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases.
E. Dust Control: Execute work by methods to minimize raising dust from construction operations. Provide positive means to prevent air-borne dust from dispersing into atmosphere and over adjacent property.
   1. Provide dust-proof enclosures to prevent entry of dust generated outdoors.
   2. Provide dust-proof barriers between construction areas and areas continuing to be occupied by Owner.
F. 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.
G. Noise Control: Provide methods, means, and facilities to minimize noise produced by construction operations.
   1. At All Times: Excessively noisy tools and operations will not be tolerated inside the building at any time of day; excessively noisy includes jackhammers.
H. Pollution Control: Provide methods, means, and facilities to prevent contamination of soil, water, and atmosphere from discharge of noxious, toxic substances, and pollutants produced by construction operations. Comply with federal, state, and local regulations.

1.07 COORDINATION
A. Coordinate scheduling, submittals, and work of the various sections of the Project Manual to ensure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.
B. Notify affected utility companies and comply with their requirements.
C. Verify that utility requirements and characteristics of new operating equipment are compatible with building utilities. Coordinate work of various sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.
D. Coordinate space requirements, supports, and installation of mechanical and electrical work that are indicated diagrammatically on drawings. Follow routing indicated for pipes, ducts, and conduit, as closely as practicable; place runs parallel with lines of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.
E. In finished areas except as otherwise indicated, conceal pipes, ducts, and wiring within the construction. Coordinate locations of fixtures and outlets with finish elements.
F. Coordinate completion and clean-up of work of separate sections.
G. After Owner occupancy of premises, coordinate access to site for correction of defective work and work not in accordance with Contract Documents, to minimize disruption of Owner's activities.

PART 2 PRODUCTS
2.01 PATCHING MATERIALS
A. New Materials: As specified in product sections; match existing products and work for patching and extending work.
B. Type and Quality of Existing Products: Determine by inspecting and testing products where necessary, referring to existing work as a standard.
C. Product Substitution: For any proposed change in materials, submit request for substitution described in Section 01 6000 - Product Requirements.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that existing site conditions and substrate surfaces are acceptable for subsequent work. Start of work means acceptance of existing conditions.
B. Verify that existing substrate is capable of structural support or attachment of new work being applied or attached.
C. Examine and verify specific conditions described in individual specification sections.
D. Take field measurements before confirming product orders or beginning fabrication, to minimize waste due to over-ordering or misfabrication.
E. Verify that utility services are available, of the correct characteristics, and in the correct locations.
F. Prior to Cutting: Examine existing conditions prior to commencing work, including elements subject to damage or movement during cutting and patching. After uncovering existing work, assess conditions affecting performance of work. Beginning of cutting or patching means acceptance of existing conditions.

3.02 PREPARATION

A. Clean substrate surfaces prior to applying next material or substance.
B. Seal cracks or openings of substrate prior to applying next material or substance.
C. Apply manufacturer required or recommended substrate primer, sealer, or conditioner prior to applying any new material or substance in contact or bond.

3.03 PREINSTALLATION MEETINGS

A. When required in individual specification sections, convene a preinstallation meeting at the site prior to commencing work of the section.
B. Require attendance of parties directly affecting, or affected by, work of the specific section.
C. Notify Architect 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. Protect survey control points prior to starting site work; preserve permanent reference points during construction.
E. Promptly report to Architect the loss or destruction of any reference point or relocation required because of changes in grades or other reasons.
F. Replace dislocated survey control points based on original survey control. Make no changes without prior written notice to Architect.
G. Utilize recognized engineering survey practices.
H. Establish elevations, lines and levels. Locate and lay out by instrumentation and similar appropriate means:
   1. Grid or axis for structures.
2. Building foundation, column locations, ground floor elevations.
   I. Periodically verify layouts by same means.
   J. Maintain a complete and accurate log of control and survey work as it progresses.

### 3.05 GENERAL INSTALLATION REQUIREMENTS

A. Make vertical elements plumb and horizontal elements level, unless otherwise indicated.
B. Install equipment and fittings plumb and level, neatly aligned with adjacent vertical and horizontal lines, unless otherwise indicated.
C. Make consistent texture on surfaces, with seamless transitions, unless otherwise indicated.
D. Make neat transitions between different surfaces, maintaining texture and appearance.

### 3.06 ALTERATIONS

A. Drawings showing existing construction and utilities are based on casual field observation and existing record documents only.
   1. Verify that construction and utility arrangements are as indicated.
   2. Report discrepancies to Architect before disturbing existing installation.
   3. Beginning of alterations work constitutes acceptance of existing conditions.
B. Remove existing work as indicated and as required to accomplish new work.
   1. Remove rotted wood, corroded metals, and deteriorated masonry and concrete; replace with new construction specified.
   2. Remove items indicated on drawings.
   3. Relocate items indicated on drawings.
   4. Where new surface finishes are to be applied to existing work, perform removals, patch, and prepare existing surfaces as required to receive new finish; remove existing finish if necessary for successful application of new finish.
   5. Where new surface finishes are not specified or indicated, patch holes and damaged surfaces to match adjacent finished surfaces as closely as possible.
C. Services (Including but not limited to HVAC, Plumbing, Fire Protection, Electrical, Telecommunications, and ______): Remove, relocate, and extend existing systems to accommodate new construction.
   1. Maintain existing active systems that are to remain in operation; maintain access to equipment and operational components; if necessary, modify installation to allow access or provide access panel.
   2. Where existing systems or equipment are not active and Contract Documents require reactivation, put back into operational condition; repair supply, distribution, and equipment as required.
   3. Where existing active systems serve occupied facilities but are to be replaced with new services, maintain existing systems in service until new systems are complete and ready for service.
      a. Disable existing systems only to make switchovers and connections; minimize duration of outages.
      b. Provide temporary connections as required to maintain existing systems in service.
   4. Verify that abandoned services serve only abandoned facilities.
   5. Remove abandoned pipe, ducts, conduits, and equipment, including those above accessible ceilings; remove back to source of supply where possible, otherwise cap stub and tag with identification; patch holes left by removal using materials specified for new construction.
D. Protect existing work to remain.
   1. Prevent movement of structure; provide shoring and bracing if necessary.
   2. Perform cutting to accomplish removals neatly and as specified for cutting new work.
   3. Repair adjacent construction and finishes damaged during removal work.

E. Adapt existing work to fit new work: Make as neat and smooth transition as possible.
1. When existing finished surfaces are cut so that a smooth transition with new work is not possible, terminate existing surface along a straight line at a natural line of division and make recommendation to Architect.

2. Where removal of partitions or walls results in adjacent spaces becoming one, rework floors, walls, and ceilings to a smooth plane without breaks, steps, or bulkheads.

3. Where a change of plane of 1/4 inch (6 mm) or more occurs in existing work, submit recommendation for providing a smooth transition for Architect review and request instructions.

4. Trim existing wood doors as necessary to clear new floor finish. Refinish trim as required.

F. Patching: Where the existing surface is not indicated to be refinished, patch to match the surface finish that existed prior to cutting. Where the surface is indicated to be refinished, patch so that the substrate is ready for the new finish.

G. Refinish existing surfaces as indicated:
   1. Where rooms or spaces are indicated to be refinished, refinish all visible existing surfaces to remain to the specified condition for each material, with a neat transition to adjacent finishes.
   2. If mechanical or electrical work is exposed accidentally during the work, re-cover and refinish to match.

H. Clean existing systems and equipment.

I. Remove demolition debris and abandoned items from alterations areas and dispose of off-site; do not burn or bury.

J. Do not begin new construction in alterations areas before demolition is complete.

K. Comply with all other applicable requirements of this section.

3.07 CUTTING AND PATCHING

A. Whenever possible, execute the work by methods that avoid cutting or patching.

B. See Alterations article above for additional requirements.

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-complying work.

D. 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.

E. Employ skilled and experienced installer to perform cutting for weather exposed and moisture resistant elements, and sight exposed surfaces.

F. Cut rigid materials using masonry saw or core drill. Pneumatic tools not allowed without prior approval.

G. Restore work with new products in accordance with requirements of Contract Documents.

H. Fit work air tight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.

I. Patching:
   1. Finish patched surfaces to match finish that existed prior to patching. On continuous surfaces, refinish to nearest intersection or natural break. For an assembly, refinish entire unit.
   2. Match color, texture, and appearance.
3. Repair patched surfaces that are damaged, lifted, discolored, or showing other imperfections due to patching work. If defects are due to condition of substrate, repair substrate prior to repairing finish.

3.08 PROGRESS CLEANING
A. Maintain areas free of waste materials, debris, and rubbish. Maintain site in a clean and orderly condition.
B. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces, and other closed or remote spaces, prior to enclosing the space.
C. Broom and vacuum clean interior areas prior to start of surface finishing, and continue cleaning to eliminate dust.
D. Collect and remove waste materials, debris, and trash/rubbish from site periodically and dispose off-site; do not burn or bury.

3.09 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 coverings if possible.

3.10 SYSTEM STARTUP
A. Coordinate schedule for start-up of various equipment and systems.
B. Notify Architect and Owner seven days prior to start-up of each item.
C. Verify that each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, control sequence, and for conditions that may cause damage.
D. Verify tests, meter readings, and specified electrical characteristics agree with those required by the equipment or system manufacturer.
E. Verify that wiring and support components for equipment are complete and tested.
F. Execute start-up under supervision of applicable Contractor personnel and manufacturer's representative in accordance with manufacturers' instructions.
G. Submit a written report that equipment or system has been properly installed and is functioning correctly.

3.11 DEMONSTRATION AND INSTRUCTION
A. Demonstrate start-up, operation, control, adjustment, trouble-shooting, servicing, maintenance, and shutdown of each item of equipment at scheduled time, at equipment location.
B. For equipment or systems requiring seasonal operation, perform demonstration for other season within six months.
C. Provide a qualified person who is knowledgeable about the Project to perform demonstration and instruction of Owner's personnel.
D. Utilize operation and maintenance manuals as basis for instruction. Review contents of manual with Owner's personnel in detail to explain all aspects of operation and maintenance.
E. Prepare and insert additional data in operations and maintenance manuals when need for additional data becomes apparent during instruction.
3.12 ADJUSTING
A. Adjust operating products and equipment to ensure smooth and unhindered operation.

3.13 FINAL CLEANING
A. Use cleaning materials that are nonhazardous.
B. 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.
C. Remove all labels that are not permanent. Do not paint or otherwise cover fire test labels or nameplates on mechanical and electrical equipment.
D. Clean equipment and fixtures to a sanitary condition with cleaning materials appropriate to the surface and material being cleaned.
E. Replace filters of operating equipment.
F. Clean debris from roofs, gutters, downspouts, scuppers, overflow drains, area drains, drainage systems, and ______.
G. Clean site; sweep paved areas, rake clean landscaped surfaces.
H. Remove waste, surplus materials, trash/rubbish, and construction facilities from the site; dispose of in legal manner; do not burn or bury.

3.14 CLOSEOUT PROCEDURES
A. Make submittals that are required by governing or other authorities.
B. Accompany Project Coordinator on preliminary observation to determine items to be listed for completion or correction in the Contractor's Correction Punch List for Contractor's Notice of Substantial Completion.
C. Notify Architect when work is considered ready for Architect's Substantial Completion observation.
D. Submit written certification containing Contractor's Correction Punch List, that Contract Documents have been reviewed, work has been inspected, and that work is complete in accordance with Contract Documents and ready for Architect's Substantial Completion inspection.
E. Conduct Substantial Completion observation and create Final Correction Punch List containing Architect's and Contractor's comprehensive list of items identified to be completed or corrected and submit to Architect.
F. Correct items of work listed in Final Correction Punch List and comply with requirements for access to Owner-occupied areas.
G. Notify Architect when work is considered finally complete and ready for Architect's Substantial Completion final observation.
H. Complete items of work determined by Architect listed in executed Certificate of Substantial Completion.

3.15 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
SECTION 01 7800
CLOSEOUT SUBMITTALS

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Project Record Documents.
B. Operation and Maintenance Data.
C. Warranties and bonds.

1.02 RELATED REQUIREMENTS
A. Section 00 7200 - General Conditions and 00 7300 - Supplementary Conditions: Performance bond and labor and material payment bonds, warranty, and correction of work.
B. Section 01 3000 - Administrative Requirements: Submittals procedures, shop drawings, product data, and samples.
C. Individual Product Sections: Specific requirements for operation and maintenance data.
D. 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. Operation and Maintenance Data:
   1. Submit an electronic copy 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.
C. Warranties and Bonds:
   1. For equipment or component parts of equipment put into service during construction with Owner's permission, submit documents within 10 days after acceptance.
   2. Make other submittals within 10 days after Date of Substantial Completion, prior to final Application for Payment.
   3. For items of Work for which acceptance is delayed beyond Date of Substantial Completion, submit within 10 days after acceptance, listing the date of acceptance as the beginning of the warranty period.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 PROJECT RECORD DOCUMENTS
A. Maintain on site one set of the following record documents; record actual revisions to the Work:
   1. Drawings.
   2. Addenda.
   3. Change Orders and other modifications to the Contract.
   4. Reviewed shop drawings, product data, and samples.
   5. Manufacturer's instruction for assembly, installation, and adjusting.
B. Ensure entries are complete and accurate, enabling future reference by Owner.
C. Store record documents separate from documents used for construction.
D. Record information concurrent with construction progress.
E. Record Drawings and Shop Drawings: Legibly mark each item to record actual construction including:
   1. Field changes of dimension and detail.
   2. 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:
   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. Where additional instructions are required, beyond the manufacturer's standard printed instructions, have instructions prepared by personnel experienced in the operation and maintenance of the specific products.

3.04 OPERATION AND MAINTENANCE DATA FOR EQUIPMENT AND SYSTEMS
   A. For Each Item of Equipment and Each System:
      1. Description of unit or system, and component parts.
      2. Identify function, normal operating characteristics, and limiting conditions.
      3. Include performance curves, with engineering data and tests.
      4. Complete nomenclature and model number of replaceable parts.
   B. Where additional instructions are required, beyond the manufacturer's standard printed instructions, have instructions prepared by personnel experienced in the operation and maintenance of the specific products.
   C. 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.
   D. 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.
   E. Provide servicing and lubrication schedule, and list of lubricants required.
   F. Include manufacturer's printed operation and maintenance instructions.
   G. Include sequence of operation by controls manufacturer.
   H. Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.
   I. Additional Requirements: As specified in individual product specification sections.

3.05 ASSEMBLY OF OPERATION AND MAINTENANCE MANUALS
   A. Assemble operation and maintenance data into durable manuals for Owner's personnel use, with data arranged in the same sequence as, and identified by, the specification sections.
   B. Where systems involve more than one specification section, provide separate tabbed divider for each system.
C. Binders: Commercial quality, 8-1/2 by 11 inch (216 by 280 mm) three D side ring binders with durable plastic covers; 2 inch (50 mm) maximum ring size. When multiple binders are used, correlate data into related consistent groupings.

D. Cover: Identify each binder with typed or printed title OPERATION AND MAINTENANCE INSTRUCTIONS; identify title of Project; identify subject matter of contents.

E. Project Directory: Title and address of Project; names, addresses, and telephone numbers of Architect, Consultants, Contractor and subcontractors, with names of responsible parties.

F. Tables of Contents: List every item separated by a divider, using the same identification as on the divider tab; where multiple volumes are required, include all volumes Tables of Contents in each volume, with the current volume clearly identified.

G. Dividers: Provide tabbed dividers for each separate product and system; identify the contents on the divider tab; immediately following the divider tab include a description of product and major component parts of equipment.

H. Text: Manufacturer's printed data, or typewritten data on 20 pound paper.

I. Drawings: Provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.

**3.06 WARRANTIES AND BONDS**

A. Obtain warranties and bonds, executed in duplicate by responsible Subcontractors, suppliers, and manufacturers, within 10 days after completion of the applicable item of work. Except for items put into use with Owner's permission, leave date of beginning of time of warranty until Date of Substantial completion is determined.

B. 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. Owner to determine the method of submittal delivery; manual in a commercial quality binder, submitted digitally or a combination of both.

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**
SECTION 02 4100
DEMOLITION

PART 1 GENERAL
1.01 SECTION INCLUDES
   A. Building demolition excluding removal of hazardous materials and toxic substances.
   B. Selective demolition of built site elements.

1.02 RELATED REQUIREMENTS
   A. Section 00 3100 - Available Project Information: Existing building survey conducted by Owner; information about known hazardous materials.
   B. Section 01 1000 - Summary: Limitations on Contractor's use of site and premises.
   C. Section 01 1000 - Summary: Description of items to be salvaged or removed for re-use by Contractor.
   D. Section 01 5000 - Temporary Facilities and Controls: Site fences, security, protective barriers, and waste removal.
   E. Section 01 6000 - Product Requirements: Handling and storage of items removed for salvage and relocation.
   F. Section 01 7000 - Execution and Closeout Requirements: Project conditions; protection of bench marks, survey control points, and existing construction to remain; reinstallation of removed products; temporary bracing and shoring.
   G. Section 07 0150.19 - Preparation for Re-Roofing: Removal of existing roofing, roof insulation, flashing, trim, and accessories.
   H. Section 31 1000 - Site Clearing: Vegetation and existing debris removal.
   I. Section 31 2200 - Grading: Topsoil removal.
   J. Section 31 2323 - Fill: Fill material for filling holes, pits, and excavations generated as a result of removal operations.

1.03 SUBMITTALS
   A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
   B. Site Plan: Showing:
      1. Areas for temporary construction and field offices.
   C. Demolition Plan: Submit demolition plan as specified by OSHA and local authorities.
      1. Indicate extent of demolition, removal sequence, bracing and shoring, and location and construction of barricades and fences.
      2. Identify demolition firm and submit qualifications.
      3. Include a summary of safety procedures.
   D. Project Record Documents: Accurately record actual locations of capped and active utilities and subsurface construction.

PART 2 PRODUCTS
2.01 MATERIALS
   A. Fill Material: As specified in Section 31 2323 - Fill.

PART 3 EXECUTION
3.01 SCOPE
   A. Remove the entire building designated Ellis Elementary.
   B. Remove paving and curbs as required to accomplish new work.
   C. Remove other items indicated, for salvage, relocation, and recycling.
D. Fill excavations, open pits, and holes in ground areas generated as result of removals, using specified fill; compact fill as specified in Section 31 2200.

3.02 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. 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.

G. If hazardous materials are discovered during removal operations, stop work and notify Architect and Owner; hazardous materials include regulated asbestos containing materials, lead, PCB's, and mercury.

H. Partial Removal of Paving and Curbs: Neatly saw cut at right angle to surface.

3.03 EXISTING UTILITIES

A. Coordinate work with utility companies; notify before starting work and comply with their requirements; obtain required permits.

B. Protect existing utilities to remain from damage.

C. Do not disrupt public utilities without permit from authority having jurisdiction.

D. Do not close, shut off, or disrupt existing life safety systems that are in use without at least 7 days prior written notification to Owner.

E. Do not close, shut off, or disrupt existing utility branches or take-offs that are in use without at least a 7 day prior written notification to Owner.

F. Locate and mark utilities to remain; mark using highly visible tags or flags, with identification of utility type; protect from damage due to subsequent construction, using substantial barricades if necessary.

G. Remove exposed piping, valves, meters, equipment, supports, and foundations of disconnected and abandoned utilities.
H. Prepare building demolition areas by disconnecting and capping utilities outside the demolition zone; identify and mark utilities to be subsequently reconnected, in same manner as other utilities to remain.

3.04 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
SECTION 03 1119
INSULATING CONCRETE FORMING

PART 1  GENERAL

2.01  SECTION INCLUDES
A. Insulating concrete forms: Modular unit formwork system for cast-in-place concrete walls; formwork designed to remain in place after concrete work is complete.
B. Shoring, bracing and anchorage.
C. Openings for other work.
D. Accessories.

2.02  RELATED REQUIREMENTS
A. Section 03 1000 - Concrete Forming and Accessories: Conventional concrete forms designed to be removed after concrete is poured and related accessories.
B. Section 03 2000 - Concrete Reinforcing: Reinforcing steel to be placed at the same time as formwork specified in this section.
C. Section 03 3000 - Cast-in-Place Concrete: Concrete to be placed into formwork specified in this section.
D. Section 05 1200 - Structural Steel Framing: Placement of embedded steel anchors and plates in cast-in-place concrete.
E. Section 05 2100 - Steel Joist Framing: Placement of embedded steel anchors, plates and joist seats in cast-in-place concrete.
F. Section 05 4000 - Cold-Formed Metal Framing: Metal studs supporting insulating concrete forms for floors and roofs.
G. Section 05 5000 - Metal Fabrications.

2.03  REFERENCE STANDARDS
A. ACI 301 - Specifications for Structural Concrete; 2016.
B. ACI 318 - Building Code Requirements for Structural Concrete and Commentary; 2014 (Errata 2017).
C. ACI 347R - Guide to Formwork for Concrete; 2014.

2.04 ADMINISTRATIVE REQUIREMENTS
A. Preinstallation Meeting: Conduct a preinstallation meeting one week prior to the start of the work of this section; require attendance by all affected installers.

2.05 SUBMITTALS
A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide data form materials and installation requirements.
C. Shop Drawings: Indicate pertinent dimensions, materials, bracing, and arrangement of joints and ties.

2.06 QUALITY ASSURANCE
A. Welder Qualifications: Show certification of welders employed on the Work, verifying AWS qualification within the previous 12 months.
B. Installer shall have 5 years minimum experience and have worked on 2 projects of similar scope.

2.07 DELIVERY, STORAGE, AND HANDLING
A. Deliver insulating concrete form system units and accessories with manufacturer's printed installation instructions and in manufacturer's original packaging.
B. Protect insulating concrete form system units and accessories from exposure to sunlight.
C. Store insulating concrete form system units off ground in ventilated and protected manner to prevent damage and deterioration from moisture.

2.08 WARRANTY
A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
B. Correct defective Work within a five year period after Date of Substantial Completion.

PART 2 PRODUCTS
3.01 MANUFACTURERS
A. Fox Blocks; Fox Blocks: www.foxblocks.com/#sle.
C. Logix; Logix: www.logixicf.com
D. Substitutions: See Section 01 6000 - Product Requirements.

3.02 FORMWORK - GENERAL
A. Provide insulating concrete forms, accessories, shoring, and bracing as required to accomplish insulated 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 and erection of formwork.
D. Bracing, Alignment, and Scaffold System:
   1. As an integral installation component of an insulating concrete form system, an adjustable metal scaffolding support and wall alignment system shall be provided.
   2. A device with adequate degrees of adjustment to ensure the completed insulating concrete form system walls are plumb after the placement and consolidation of concrete.
3. An OSHA compliant scaffold support system to facilitate proper stacking of forms and placement of concrete.
4. System adequate to reinforce and protect completed insulating concrete form installation prior to the attachment of structural elements to protect from wind damage.

3.03 INSULATING CONCRETE FORMS

A. Performance Requirements:
1. Thermal Insulance, R-value (RSI-value), of Assembled System: Calculated thermal insulation when tested in accordance with ASTM C177.
   a. Wall System: 22 deg F hr sq ft (3.9 K sq m/W), minimum.
2. Sound Transmission Class, Assembled Wall Units: 49, minimum; based on assembly composed of two rigid foam boards separated by an 8 inch (203 mm) concrete core with a stucco exterior and 5/8 inch (16 mm) thick drywall interior.

B. Insulating Concrete Form Units for Walls: Rigid, expanded polystyrene boards; boards connected horizontally with injection--molded polypropylene webs and vertically by means of interlocking edges.
   1. Board Thickness: 2-5/8 inches (66.7 mm).
   2. Web Spacing: 8 inches (203 mm) on center, vertically.
   3. Web Configuration: 1/2 inch (12.7 mm) wide by 15 inches (381 mm); integral supports for horizontal reinforcing steel; continuous end plates recessed 1/2 inch (12.7 mm) below surface of insulation on each face of unit to allow attachment of interior and exterior finishes without damage to insulation board.
   4. Concrete Core Thickness: 8 inches (203.2 mm) and 10 inches (254 mm).
   5. Unit Types:
      a. Reversible straight form.
      b. Reversible 90 degree corner.
      c. Reversible 45 degree corner.
      d. End cap.
      e. " T " units.
      f. Height-adjustable.

3.04 COMPONENTS

A. Expanded Polystyrene (EPS) Insulation Board, General: Comply with the minimum requirements of ASTM C578, Type II and the specified characteristics below.
   1. Density: 1.35 pounds per cubic foot (22 kg/cu m) when tested in accordance with ASTM D1622/D1622M.
   2. Compressive Strength: 15 psi (104 kPa) when tested in accordance with ASTM D1621.
   3. Flexural Strength: 35 psi (240 kPa) when tested in accordance with ASTM C203.
   4. Water Absorption: 3.0 percent by volume, maximum.
   5. Dimensional Stability: 2.0 percent, maximum, when tested in accordance with ASTM D2126.
   6. Oxygen Index: 24 percent by volume, minimum, when tested in accordance with ASTM D2863.
   7. Flammability; when tested in accordance with ASTM E84:
      a. Flame Spread: 25 or less.
      b. Smoke Developed: 450 or less.

B. Expanded Polystyrene (EPS) Insulation Boards: Comply with the minimum requirements of ASTM C578, Type II and the specified characteristics below.
   1. Thermal Resistance: R-value (RSI-value) of 4.0 deg F hr sq ft/Btu (0.70 K sq m/W), minimum, when tested at 1 inch (25.4 mm) thickness in accordance with ASTM C177.
   2. Water Vapor Permeance: 3.5 perms (201 ng/Pa sec sq m), maximum, when tested at 1 inch (25.4 mm) thickness in accordance with ASTM E96/E96M.
   3. Tolerances:
      a. Edge and Face Trueness: 0.03 inch/ft (2.5 mm/m), maximum.
      b. Length and Width Squareness: 0.06 inch/ft (5.0 mm/m), maximum.
C. Injection Molded Polypropylene Ties and Profiles:
1. Tensile Strength: 253.3 pounds (1127 N) when tested in accordance with ASTM D638.
2. Ignition Temperature: 400 degrees F (204 degrees C).
3. Burn Rate: 0.80 inch (20.2 mm) per minute when tested in accordance with ASTM D635.
4. Smoke Density: 25.9 percent maximum when tested in accordance with ASTM D2843.
5. Fastener Resistance; ASTM D1761:
   a. Type W Coarse Thread Drywall Screw Withdrawal Load: 38.42 pounds (170 N).
   b. Type W Coarse Thread Drywall Screw Lateral Resistance Load: 50.56 pounds (225 N).

D. Accessories: Provide the manufacturer's standard items listed below.
1. Door and window block outs.
2. Masonry anchors
3. Sleeves for wall penetrations.

3.05 MATERIALS
A. Concrete, for Use with insulating Concrete Forms: Comply with the applicable requirements of Section 03 3000 and specific requirements listed below.
   1. Aggregate:
      a. Normal weight.
      b. Size: 3/8 inch (9.5 mm) to 1/2 inch (12.7 mm) diameter.
   2. Compressive Strength: 4000 pounds per square inch (___ MPa), minimum.
   3. Water to Cement Ratio: 0.55 or less.
   4. Slump: 5 inches (127 mm) to 6 inches (152 mm).
B. Reinforcing Steel: Comply with the applicable requirements of Section 03 1000. Size, material grade, placement and spacing as indicated on the structural drawings.
C. Cold Formed Metal Framing: Comply with the applicable requirements of Section 05 4000. Size, material grade, placement and spacing as indicated on the structural drawings.

PART 3 EXECUTION
4.01 EXAMINATION
A. Verify lines, levels and centers before proceeding with insulating concrete form work. Ensure that dimensions agree with drawings.
B. Verify placement of dowels and other anchors in foundations comply with the approved Contract Documents and the recommendations of the insulating concrete form manufacturer.

4.02 PREPARATION
A. Clean tops of footings and other foundation elements before starting formwork.

4.03 ERECTION - FORMWORK
A. Erect formwork, shoring and bracing as recommended by the manufacturer. Protect forms from damage.
B. Erect formwork, shoring and bracing to achieve design requirements. Comply with applicable requirements of ACI 301.
C. Brace forms as recommended by manufacturer to ensure stability. Shore or strengthen formwork subject to overstressing by construction loads.
D. Align joints. Install units in running bond.
E. Ensure webs and attachment strips are properly aligned.
F. Install steel reinforcement as insulating concrete form work progresses and as indicated on the structural engineering drawings.
G. Install alignment system as recommended by manufacturer and as work progresses.
4.04 INSERTS, EMBEDDED PARTS, AND OPENINGS
   A. Remove insulating concrete form material and provide sleeves or other means to create formed
      openings where required. Cut forms for utility penetrations as needed. Coordinate location of
      openings for items to be embedded in or pass through concrete work.
   B. Locate and set in place items that will be cast directly into concrete.
   C. Install accessories in accordance with manufacturer’s instructions, so they are straight, level,
      and plumb. Ensure items are not disturbed during concrete placement.

4.05 FORMWORK TOLERANCES
   A. Construct formwork to maintain tolerances required by ACI 301.

4.06 FIELD QUALITY CONTROL
   A. An independent testing agency will perform field quality control tests, as specified in Section 01
      4000 - Quality Requirements.
   B. Inspect insulating concrete form system, shoring, and bracing to ensure that work complies with
      the approved shop drawings and to verify that supports, fastenings, webs, alignment devices,
      attachment strips and other items are secure.

4.07 CLEANING
   A. Clean forms as installation progresses. Remove dirt, dust, debris, excess material, etc. within
      forms.
   B. Clean formed cavities and openings.
   C. Flush completed forms with compressed air or water.
      1. If water is used, ensure that water and debris drain to exterior through clean-out ports and
         that formwork is free of standing water and dry before concreting begins.
      2. During weather cold enough that water could be reasonably expected to freeze, do not use
         water to clean out forms unless form installation and concreting proceed within a heated
         enclosure.

END OF SECTION
SECTION 03 2000
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 REFERENCE STANDARDS
   A. ACI 301 - Specifications for Structural Concrete; 2016.

1.03 SUBMITTALS
   A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
   B. Shop Drawings: Comply with requirements of ACI SP-66. Include bar schedules, shapes of bent bars, spacing of bars, and location of splices.
      1. Prepare shop drawings under seal of a Professional Structural Engineer experienced in design of work of this type and licensed in Utah.

1.04 QUALITY ASSURANCE
   A. Perform work of this section in accordance with ACI 301.

PART 2  PRODUCTS
2.01 REINFORCEMENT
   A. Reinforcing Steel: ASTM A615/A615M, Grade 60 (60,000 psi) (420 MPa).
      1. Deformed billet-steel bars.
      2. Unfinished.
   B. Reinforcement Accessories:
      1. Tie Wire: Annealed, minimum 16 gage, 0.0508 inch (1.29 mm).
      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 (38 mm) of weathering surfaces.

2.02 RE-BAR SPLICING:
   A. Coupler Systems: Mechanical devices for splicing reinforcing bars; capable of developing full steel reinforcing design strength in tension and compression.
   B. Dowel Bar Splicer with Dowel-Ins: Mechanical devices for connecting dowels; capable of developing full steel reinforcing design strength in tension and compression.
   C. Taper Tie Hole Plug: Mechanical device for plugging tie holes; anchors optional flush or recessed grout.
   D. Grout: Cementitious, non-metallic, non-shrink grout for use with manufacturer's grout sleeve reinforcing bar coupler system.

2.03 FABRICATION

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 noted on structural drawings.
E. Comply with applicable code for concrete cover over reinforcement.

3.02 FIELD QUALITY CONTROL
A. An independent testing agency, as specified in Section 01 4000 - Quality Requirements, will inspect installed reinforcement for conformance to contract documents before concrete placement.

3.03 SCHEDULES
A. Reinforcement For Superstructure Framing Members: Deformed bars, unfinished.
B. Reinforcement For Foundation Wall Framing Members and Slab-on-Grade: Deformed bars and welded wire reinforcement, galvanized finish.

END OF SECTION
SECTION 03 3000
CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Concrete formwork.
B. Concrete building frame members.
C. Floors and slabs on grade.
D. Concrete foundation walls.
E. Concrete reinforcement.
F. Joint devices associated with concrete work.
G. Miscellaneous concrete elements, including equipment pads, equipment pits, light pole bases, flagpole bases, thrust blocks, and manholes.
H. Concrete curing.

1.02 RELATED REQUIREMENTS

A. Section 07 9200 - Joint Sealants: Products and installation for sealants and joint fillers for saw cut joints and isolation joints in slabs.
B. Section 32 1313 - Concrete Paving: Sidewalks, curbs and gutters.

1.03 REFERENCE STANDARDS

B. ACI 301 - Specifications for Structural Concrete; 2016.
C. ACI 302.1R - Guide to Concrete Floor and Slab Construction; 2015.
G. ACI 308R - Guide to External Curing of Concrete; 2016.
H. ACI 318 - Building Code Requirements for Structural Concrete and Commentary; 2014 (Errata 2017).
O. ASTM E1155M - Standard Test Method for Determining F(F) Floor Flatness and F(L) Floor Levelness Numbers (Metric); 2014.
P. ASTM E1643 - Standard Practice for Selection, Design, Installation and Inspection of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs; 2011 (Reapproved 2017).
Q. ASTM E1745 - Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs; 2017.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Submit manufacturers’ data on manufactured products showing compliance with specified requirements and installation instructions.
   1. For curing compounds, provide data on method of removal in the event of incompatibility with floor covering adhesives.

C. Mix Design: Submit proposed concrete mix design.

D. Samples: Submit samples of underslab vapor retarder to be used.

E. Samples: Submit two, 12 inch (305 mm) long samples of waterstops and construction joint devices.

1.05 QUALITY ASSURANCE

A. Perform work of this section in accordance with ACI 301 and ACI 318.

B. Follow recommendations of ACI 305R when concreting during hot weather.

C. Follow recommendations of ACI 306R when concreting during cold weather.

1.06 WARRANTY

A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

PART 2 PRODUCTS

2.01 FORMWORK

A. Form Materials: Contractor’s choice of standard products with sufficient strength to withstand hydrostatic head without distortion in excess of permitted tolerances.
   1. Form Coating: Release agent that will not adversely affect concrete or interfere with application of coatings.
   2. Form Ties: Cone snap type that will leave no metal within 1-1/2 inches (38 mm) of concrete surface.

2.02 REINFORCEMENT MATERIALS

A. Reinforcing Steel: ASTM A615/A615M, Grade 60 (60,000 psi) (420 MPa).
   1. Type: Deformed billet-steel bars.
   2. Finish: Unfinished, unless otherwise indicated.

B. Reinforcement Accessories:
   2. Provide galvanized, plastic, or plastic coated steel components for placement within 1-1/2 inches (38 mm) of weathering surfaces.

2.03 CONCRETE MATERIALS

A. Cement: ASTM C150/C150M, Type I - Normal Portland type.
   1. Acquire cement for entire project from same source.

B. Fine and Coarse Aggregates: ASTM C33/C33M.
   1. Acquire aggregates for entire project from same source.

C. Water: Clean and not detrimental to concrete. ASTM C 94/C 94M and Potable

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.
2.05 ACCESSORY MATERIALS
   A. Underslab Vapor Retarder: Sheet material 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. Installation: Comply with ASTM E1643.
      2. Accessory Products: Vapor retarder manufacturer's recommended tape, adhesive, mastic, prefabricated boots, etc., for sealing seams and penetrations.
      3. Manufacturers:
         c. Raven Industries Inc.; Vapor Block
         d. Reef Industries, Inc.; Griffolyn
         e. Substitutions: See Section 01 6000 - Product Requirements.

2.06 BONDING AND JOINTING PRODUCTS
   A. Waterstops: TechCrete Waterstop Strip
   B. Slab Isolation Joint Filler: 1/2 inch (13 mm) thick, height equal to slab thickness, with removable
      top section that will form 1/2 inch (13 mm) deep sealant pocket after removal.
   C. Slab Contraction Joint Device: Preformed linear strip intended for pressing into wet concrete to
      provide straight route for shrinkage cracking.
      1. Location/ Spacing: 10'-0" O.C. each way

2.07 CONCRETE MIX DESIGN
   A. Proportioning Normal Weight Concrete: Comply with ACI 211.1 recommendations.
   B. Fiber Reinforcement: Add to mix at rate of 1.5 pounds per cubic yard (0.89 kg per cu m), or as
      recommended by manufacturer for specific project conditions.
   C. Normal Weight Concrete:
      1. Compressive Strength, when tested in accordance with ASTM C39/C39M at 28 days: As
         indicated on drawings.
      2. Water-Cement Ratio: Maximum as noted on structural drawings.
      3. Total Air Content: as noted on structural drawings, determined in accordance with ASTM
         C173/C173M.
      4. Maximum Slump: 4 inches (100 mm).
      5. Maximum Aggregate Size: As noted on structural drawings. ___ inch (___ mm)

PART 3 EXECUTION
3.01 EXAMINATION
   A. Verify lines, levels, and dimensions before proceeding with work of this section.

3.02 PREPARATION
   A. Formwork: Comply with requirements of ACI 301. Design and fabricate forms to support all
      applied loads until concrete is cured, and for easy removal without damage to concrete.
   B. In locations where new concrete is doweled to existing work, drill holes in existing concrete,
      insert steel dowels and pack solid with non-shrink grout.
   C. Interior Slabs on Grade: Install vapor retarder under interior slabs on grade. Lap joints
      minimum 6 inches (150 mm). Seal joints, seams and penetrations watertight with
      manufacturer's recommended products and follow manufacturer's written instructions. Repair
      damaged vapor retarder before covering.
      1. Granular Fill Over Vapor Retarder: Cover vapor retarder with compactible granular fill as
         indicated on drawings. Do not use sand.
3.03 INSTALLING REINFORCEMENT AND OTHER EMBEDDED ITEMS
   A. Comply with requirements of ACI 301. Clean reinforcement of loose rust and mill scale, and accurately position, support, and secure in place to achieve not less than minimum concrete coverage required for protection.
   B. Install welded wire reinforcement in maximum possible lengths, and offset end laps in both directions. Splice laps with tie wire.
   C. Verify that anchors, seats, plates, reinforcement and other items to be cast into concrete are accurately placed, positioned securely, and will not interfere with concrete placement.

3.04 PLACING CONCRETE
   A. Place concrete in accordance with ACI 304R.
   B. Place concrete for floor slabs in accordance with ACI 302.1R.
   C. Ensure reinforcement, inserts, waterstops, embedded parts, and formed construction joint devices will not be disturbed during concrete placement.

3.05 SLAB JOINTING
   A. Anchor joint fillers and devices to prevent movement during concrete placement.
   B. 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.

3.06 FLOOR FLATNESS AND LEVELNESS TOLERANCES
   A. Correct the slab surface if tolerances are less than specified.
   B. Measure F(F) Floor Flatness and F(L) Floor Levelness in accordance with ASTM E1155 (ASTM E1155M), within 48 hours after slab installation; report both composite overall values and local values for each measured section.
   C. Correct 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.

3.07 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 (6 mm) or more in height.
   C. Exposed Form Finish 12 inches or less above grade: Rub down or chip off and smooth fins or other raised areas 1/4 inch (6 mm) or more in height. Provide finish as follows:
      1. Grout Cleaned Finish: Wet areas to be cleaned and apply grout mixture by brush or spray; scrub immediately to remove excess grout. After drying, rub vigorously with clean burlap, and keep moist for 36 hours.
   D. Concrete Slabs: Finish to requirements of ACI 302.1R, and as follows:
      1. Decorative Exposed Surfaces: Trowel as described in ACI 302.1R; use steel-reinforced plastic trowel blades instead of steel blades to avoid black-burnish marks; decorative exposed surfaces include surfaces to be stained or dyed, pigmented concrete, surfaces to receive liquid hardeners, surfaces to be polished, and all other exposed slab surfaces.
   E. In areas with floor drains, maintain floor elevation at walls; pitch surfaces uniformly to drains at 1:100 nominal.
   F. Exterior Slabs: Provide light to medium broom finish perpendicular to the path of traffic.

3.08 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.
      1. Normal concrete: Not less than seven days.
2. High early strength concrete: Not less than four days.

C. Surfaces Not in Contact with Forms:
   1. Slabs and Floors To Receive Adhesive-Applied Flooring: Curing compounds and other surface coatings are usually considered unacceptable by flooring and adhesive manufacturers. If such materials must be used, either obtain the approval of the flooring and adhesive manufacturers prior to use or remove the surface coating after curing to flooring manufacturer's satisfaction.
   2. 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.
   3. Final Curing: Begin after initial curing but before surface is dry.

3.09 FIELD QUALITY CONTROL
   A. An independent testing agency will perform field quality control tests, as specified in Section 01 4000 - Quality Requirements.
   B. Provide free access to concrete operations at project site and cooperate with appointed firm.
   C. Submit proposed mix design of each class of concrete to inspection and testing firm for review prior to commencement of concrete operations.
   D. Tests of concrete and concrete materials may be performed at any time to ensure compliance with specified requirements.
   E. Take one additional test cylinder during cold weather concreting, cured on job site under same conditions as concrete it represents.

3.10 DEFECTIVE CONCRETE
   A. 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.

3.11 PROTECTION
   A. Do not permit traffic over unprotected concrete floor surface until fully cured.

END OF SECTION
SECTION 03 4500
PRECAST ARCHITECTURAL CONCRETE

PART 1 GENERAL

1.01 SECTION INCLUDES
   A. Architectural precast concrete trim.
   B. Supports, anchors, and attachments.
   C. Architectural precast concrete stair treads - provided by stair manufacturer.

1.02 RELATED REQUIREMENTS
   A. Section 03 3000 - Cast-in-Place Concrete: Admixtures.
   B. Section 07 9200 - Joint Sealants: Sealing perimeter and intermediate joints.

1.03 REFERENCE STANDARDS
   A. ACI 301 - Specifications for Structural Concrete; 2016.
   B. ACI 318 - Building Code Requirements for Structural Concrete and Commentary; 2014 (Errata 2017).

1.04 SUBMITTALS
   A. See Section 01 3000 - 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, connection details, support items, location of lifting devices, dimensions, openings, and relationship to adjacent materials. Provide erection drawings.

1.05 QUALITY ASSURANCE
   A. Fabricator Qualifications:
      1. Firm having at least 2 years of documented experience in production of precast concrete of the type required.

1.06 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.

PART 2 PRODUCTS

2.01 PRECAST UNITS, GENERAL
   A. Precast Architectural Concrete Units: Comply with PCI MNL-120, PCI MNL-122, PCI MNL-123, PCI MNL-135, and ACI 318.
      1. Concrete Face Mix: Minimum 5000 psi (34 MPa), 28 day strength, air entrained to 5 to 7 percent; comply with ACI 301.
   B. Finish Type A: Ensure exposed-to-view finish surfaces of precast units are uniform in color and appearance. Replace any units deemed not acceptable by the architect.
   C. Hone any exposed to view edges which are rough or otherwise unfinished looking.
   D. Precast Concrete Stair Treads:
      1. Tread Sizes: As shown on drawings.
      2. Treads Depths: 2 inches.
      3. Finish: Polished to expose aggregate.
5. Provide 3 non-slip safety grooves at nosing.

**2.02 REINFORCEMENT**
A. Reinforcing Steel: ASTM A615/A615M, Grade 40 (40,000 psi) (280 MPa).

**2.03 CONCRETE MATERIALS**
A. Cement: ASTM C150/C150M, Type I - Normal Portland type.
B. Color Additives: Pure, concentrated mineral pigments specifically intended for mixing into concrete and complying with ASTM C979/C979M.
   1. Color(s): To match Architect's sample(s) when incorporated into specified mix design(s).

**2.04 SUPPORT DEVICES**
A. Connecting and Support Devices; Anchors and Inserts: ASTM A36/A36M steel; hot-dip galvanized in accordance with ASTM A153/A153M.
   1. Clean surfaces of rust, scale, grease, and foreign matter.

**2.05 FABRICATION**
A. Fabricate in compliance with PCI MNL-117 and PCI MNL-135.

**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 ERECTION**
A. Erect units without damage to shape or finish. Replace or repair damaged panels.
B. Erect units level and plumb within allowable tolerances.

END OF SECTION
SECTION 04 2000
UNIT MASONRY

PART 1  GENERAL

1.01  SECTION INCLUDES
A. Concrete block.
B. Mortar and grout.
C. Reinforcement and anchorage.
D. Flashings.
E. Lintels.
F. Accessories.

1.02  RELATED REQUIREMENTS
A. Section 04 0511 - Mortar and Masonry Grout.
B. Section 05 5000 - Metal Fabrications: Loose steel lintels.
C. Section 06 1000 - Rough Carpentry: Nailing strips built into masonry.
D. Section 07 2100 - Thermal Insulation: Insulation for cavity spaces.
E. Section 07 6200 - Sheet Metal Flashing and Trim: Through-wall masonry flashings.
F. Section 07 9200 - Joint Sealants: Sealing control and expansion joints.

1.03  REFERENCE STANDARDS

1.04  ADMINISTRATIVE REQUIREMENTS
A. Preinstallation Meeting: Convene a preinstallation meeting one week before starting work of this section; require attendance by all relevant installers.

1.05  SUBMITTALS
A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide data for masonry units, fabricated wire reinforcement, mortar, and masonry accessories.
C. Shop Drawings: Indicate pertinent dimensions, materials, anchorage, size and type of fasteners, and accessories for brickwork support system.
D. Samples: Submit four samples of decorative block units to illustrate color, texture, and extremes of color range.

1.06 QUALITY ASSURANCE
A. Comply with provisions of TMS 402/602, except where exceeded by requirements of Contract Documents.
B. Manufacturer Qualifications: Company specializing in manufacturing the type of products specified in this section with minimum three years of documented experience.
C. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years of documented experience.

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.

PART 2 PRODUCTS

2.01 CONCRETE MASONRY UNITS
A. Concrete Block: Comply with referenced standards and as follows:
   1. Size: Standard units with nominal face dimensions of 16 by 8 inches (400 by 200 mm) and nominal depth of 8 inches (200 mm).
   2. Special Shapes: Provide non-standard blocks configured for corners.
   3. Load-Bearing Units: ASTM C90, medium weight.
      a. Hollow block.
      b. Manufacturers:
         1) AMCON - Basis of Design.
         2) Amcor Masonry, Oldcastle APG

2.02 MORTAR AND GROUT MATERIALS
A. Masonry Cement: ASTM C91/C91M, Type S.
B. Portland Cement: ASTM C150/C150M, Type I; color as required to produce approved color sample.
   1. Not more than 0.60 percent alkali.
C. Hydrated Lime: ASTM C207, Type S.
D. Mortar Aggregate: ASTM C144.
E. Grout Aggregate: ASTM C404.
F. Water: Clean and potable.
G. Accelerating Admixture: Nonchloride type for use in cold weather.
H. Packaged Dry Material for Mortar for Unit Masonry: Premixed Portland cement, hydrated lime, and sand; complying with ASTM C1714/C1714M and capable of producing mortar of the specified strength in accordance with ASTM C270 with the addition of water only.
   1. Type: Type S.
   2. Color: As selected by Architect.
I. Packaged Dry Material for Grout for Masonry: Premixed cementitious materials and dried aggregates; capable of producing grout of the specified strength in accordance with ASTM C476 with the addition of water only.
   1. Type: Fine.

2.03 REINFORCEMENT AND ANCHORAGE
A. Reinforcing Steel: ASTM A615/A615M, Grade 60 (60,000 psi) (420 MPa), deformed billet bars; uncoated.
B. Joint Reinforcement: Use ladder type joint reinforcement where vertical reinforcement is involved and truss type elsewhere, unless otherwise indicated.
C. Masonry Veneer Anchors: 2-piece anchors that permit differential movement between masonry veneer and structural backup, hot dip galvanized to ASTM A 153/A 153M, Class B.
   1. Anchor plates: Not less than 0.075 inch (1.91 mm) thick, designed for fastening to structural backup through sheathing by two fasteners; provide design with legs that penetrate sheathing and insulation to provide positive anchorage.
   2. Wire ties: Manufacturer's standard shape, 0.1875 inch (4.75 mm) thick.
   3. Vertical adjustment: Not less than 3-1/2 inches (89 mm).
   4. Seismic Feature: Provide lip, hook, or clip on end of wire ties to engage or enclose not less than one continuous horizontal joint reinforcement wire of 0.1483 inch (3.8 mm) diameter.

D. Metal-to-Metal Fasteners: Self-drilling, self-tapping screws; corrosion resistant finish or hot dip galvanized to ASTM A153/A153M.

2.04 FLASHINGS
A. Metal Flashing Materials: Copper, as specified in Section 07 6200.
B. Factory-Fabricated Flashing Corners and End Dams: Stainless steel.
C. Flashing Sealant/Adhesives: Silicone, polyurethane, or silyl-terminated polyether/polyurethane or other type required or recommended by flashing manufacturer; type capable of adhering to type of flashing used.
D. Termination Bars: Stainless steel; compatible with membrane and adhesives.
E. Drip Edge: Copper; angled drip with hemmed edge; compatible with membrane and adhesives.

2.05 ACCESSORIES
A. Cleaning Solution: Non-acidic, not harmful to masonry work or adjacent materials.

2.06 MORTAR AND GROUT MIXING
A. Mortar for Unit Masonry: ASTM C270, using the Proportion Specification.
   1. Masonry below grade and in contact with earth: Type S.
   2. Exterior, loadbearing masonry: Type S.
   3. Exterior, non-loadbearing masonry: Type N.
   4. Interior, loadbearing masonry: Type S.
   5. Interior, non-loadbearing masonry: Type O.
B. Colored Mortar: Proportion selected pigments and other ingredients to match Architect's sample, without exceeding manufacturer's recommended pigment-to-cement ratio.

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.

3.02 PREPARATION
A. Provide temporary bracing during installation of masonry work. Maintain in place until building structure provides permanent bracing.

3.03 COLD AND HOT WEATHER REQUIREMENTS
A. Comply with requirements of TMS 402/602 or applicable building code, whichever is more stringent.

3.04 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 (200 mm).

### 3.05 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 and mortar smears as work progresses.
D. Remove excess mortar with water repellent admixture promptly. Do not use acids, sandblasting or high pressure cleaning methods.
E. Interlock intersections and external corners, except for units laid in stack bond.
F. Do not shift or tap masonry units after mortar has achieved initial set. Where adjustment must be made, remove mortar and replace.
G. Perform job site cutting of masonry units with proper tools to provide straight, clean, unchipped edges. Prevent broken masonry unit corners or edges.
H. Cut mortar joints flush where wall tile is scheduled or resilient base is scheduled.
I. Isolate masonry partitions from vertical structural framing members with a control joint as indicated.

### 3.06 REINFORCEMENT AND ANCHORAGE - GENERAL, SINGLE WYTHE MASONRY, AND CAVITY WALL MASONRY
A. See Structural Drawings.

### 3.07 LINTELS
A. Install loose steel lintels over openings.
B. Install reinforced unit masonry lintels over openings as indicated on structural drawings.
   1. Do not splice reinforcing bars.
   2. Support and secure reinforcing bars from displacement. Maintain position within 1/2 inch (13 mm) of dimensioned position.
   3. Place and consolidate grout fill without displacing reinforcing.
   4. Allow masonry lintels to attain specified strength before removing temporary supports.

### 3.08 BUILT-IN WORK
A. As work progresses, install built-in metal door frames and glazed frames and other items to be built into the work and furnished under other sections.
B. Install built-in items plumb, level, and true to line.
C. Bed anchors of metal door and glazed frames in adjacent mortar joints. Fill frame voids solid with grout.
   1. Fill adjacent masonry cores with grout minimum 12 inches (300 mm) from framed openings.
D. Do not build into masonry construction organic materials that are subject to deterioration.

### 3.09 TOLERANCES
A. Maximum Variation From Unit to Adjacent Unit: 1/16 inch (1.6 mm).
B. Maximum Variation from Plane of Wall: 1/4 inch in 10 ft (6 mm/3 m) and 1/2 inch in 20 ft (13 mm/6 m) or more.
C. Maximum Variation from Level Coursing: 1/8 inch in 3 ft (3 mm/m) and 1/4 inch in 10 ft (6 mm/3 m); 1/2 inch in 30 ft (13 mm/9 m).

### 3.10 CUTTING AND FITTING
A. As needed.

### 3.11 CLEANING
A. Remove excess mortar and mortar droppings.
B. Clean soiled surfaces with cleaning solution.

3.12 PROTECTION
A. Without damaging completed work, provide protective boards at exposed external corners that are subject to damage by construction activities.

END OF SECTION
SECTION 04 2150
ADHERED THIN BRICK VENEER UNITS

PART 1  GENERAL

1.01  SUMMARY
A.  Section Includes: Thin Brick masonry veneer units.
B.  Related Sections:
1.  Section 054000 - Cold-Formed Metal Framing
2.  Section 076000 - Flashing and Sheet Metal
3.  Section 079000 - Expansion and Control Joints
4.  Section 079200 - Joint Sealants

1.02  REFERENCES
A.  American Society for Testing and Materials (ASTM):
1.  A 525 – Steel Sheet Zinc-Coated – hot dip galvanized
2.  C 33 - Specification for Concrete Aggregates.
4.  C 79 – Gypsum Sheathing board
6.  C 578 – Preformed Cellular Polystyrene Thermal Insulation
7.  C 482-02 Standard Test Method for Bond Strength of Ceramic Tile to Portland Cement
B.  ANSI
1.  A108.11 Installation of cementitious backer units.
3.  A118.1 Dry-set Portland cement mortar.
4.  A118.4 latex Portland cement mortar.
5.  A118.9 Cementitious backer units.
6.  A118.10 Waterproof membranes for thin-set brick.
7.  A136.1 Organic Adhesives, Type I and Type II
C.  International Building Code (ICC), adopted addition.
E.  PCA Plaster and Stucco Handbook, latest edition
G.  Masonry Veneer Manufacturers Association Installation Guide and Detailing for Compliance with ASTM C1780, latest edition

1.03  SUBMITTALS
A.  Submit under provisions of Section 013300.
B.  Product Data, and Evaluation Reports as required for installation.
C.  Shop Drawings: Include elevations of each wall indicating type and layout of units.
D.  Samples: Include samples of stretcher units in sufficient quantity to illustrate color range and texture.
E. Test Reports from an independent testing laboratory showing compliance with applicable specifications.
F. Provide manufacturer's specification, data, and installation for review prior to fabrication of work.
G. Submit installer's coordination drawings indicating the work of this section with that of related work of other sections for proper interface of the completed work. Installer shall coordinate and obtain approvals from the work of other related sections prior to submitting to the Architect.

1.04 QUALITY ASSURANCE
A. Continuous Inspection:
   1. Employ a qualified masonry inspector for continuous inspection of the masonry work. Acceptance by a State or municipality having a program of examining and certifying masonry inspectors will be considered adequate qualifications. The masonry inspector shall be at the site during all masonry construction and perform the following duties:
      a. Review Drawings and Specifications and meet with the CONTRACTOR to discuss requirements before work commences.
      b. Before masonry work commences, CONTRACTOR and the Contractor's Quality Control Representative shall attend meeting with ENGINEER to review the requirements for surveillance and quality control of the masonry work.
      c. Check brand and type of cement, lime (if used), and source of sand.
      d. Ensure that the backing is continuous, rough, and moisture resistant to receive units.
      e. Observe field proportioning of mortar. Visually check aggregate to determine uniformity of grading, cleanliness, and moisture.
      f. Ensure that joints are full of mortar and kept tight during work.
      g. Continuously observe placing of grout.
      h. Perform or supervise performance of required sampling and testing.
      2. Keep complete record of inspections. Report daily to the Contractor's Quality Control Representative the progress of the masonry inspection.

B. Mock-up:
   1. Prior to starting construction of masonry, construct minimum 4 foot square mock-up.
   2. Use accepted materials, containing each different kind and color of brick masonry units to illustrate wall design.
   3. Show color range, texture range, bond, mortar color, joint tooling, critical design details and quality of workmanship.
   4. Masonry construction may not proceed until the Architect/Engineer approves mock-up.
   5. When not accepted, construct another mock-up.
   6. When accepted, mock-up will be standard of comparison for remainder of masonry work.
   7. Upon completion and acceptance of Project, dispose of mock-ups in legal manner at offsite location.

C. Certification: Furnish manufacturer's certification that clay thin brick units provided meet or exceed the requirements of this specification.

1.05 DELIVERY, STORAGE, AND HANDLING
A. Store masonry units above ground to prevent contamination by mud, dust or other materials likely to cause staining or other defects.
B. Cover and protect masonry units from inclement weather to maintain quality control and physical requirements.
C. Transport and handle brick masonry units as required to prevent discoloration, chipping, and breakage.
D. Locate storage piles, stacks, and bins to protect materials from heavy traffic.
E. Remove chipped, cracked, and otherwise defective units from jobsite upon discovery.

1.06 PROJECT CONDITIONS
A. Cold Weather Requirements:
1. In accordance IBC Section 2104.3.
2. Provide adequate equipment for heating masonry materials when air temperature is below 40 degrees Fahrenheit (4 degrees Celsius).

B. Hot Weather Requirements:
1. In accordance with IBC Section 2104.4.
2. When ambient air temperature exceeds 100 degrees Fahrenheit (38 degrees Celsius), or when ambient air temperature exceeds 90 degrees Fahrenheit (32 degrees Celsius) and wind velocity is greater than 8 miles per hour, implement hot weather protection procedures.
3. Wet mortar board before loading and cover mortar to retard drying when not being used.
4. Do not spread mortar beds more than 48 inches (1.22 m) ahead of placing masonry units.
5. Place masonry units within one minute of spreading mortar.

C. Wetting of Brick: shall be required at the time of laying if the unit’s initial rate of absorption (IRA) exceeds 30 grams per 30 square inches per minute or 1 g/645mm2.

PART 2 PRODUCTS

2.01 THIN BRICK MASONRY UNITS
A. Manufacturers:
1. Interstate Brick/HC Muddox: www.interstatebrick.com; www.hcmuddox.com
2. Sales Representative:
   a. Jonathan Walters (801) 301-7933, jonathan.walters@interstatebrick.com
B. Type: ASTM C 1088, Grade Exterior, Type TBS thin veneer brick.
C. Surface Texture: To be selected by Architect/ENGINEER from manufacturer’s full range of available textures.
D. Color: As selected by Architect from standard colors.
E. Size: As indicated on the drawings.
F. Special Sizes and Shapes: As required for window and door locations and custom sills where indicated, corners, and other special applications to minimize cutting.
G. Substitutions: None allowed

2.02 SETTING BED MORTAR
A. Site mixed: Meet requirements of ASTM C270 Type N or Type S. Not for use with cement board substrate
B. Preblended: Meet requirements of ASTM C1714/C1714M Type S. Not for use with cement board substrate
C. Modified mortar for use with cement board substrate: comply with ANSI A118.4 or A118.15
D. Mortar Bed Installations: For mortar setting bed (scratch) or brown coat as the substrate for thin brick work; work to conform to ANSI A108.1 or ACI 530
   1. Portland Cement Mortar
      a. Premixed: Type S premixed mortar or by proportions 1 part cement; ½ part lime and 4½ parts sand.
   2. Meeting the following minimum requirements:
      a. Bond Strength (ACI 530)…………………..…..100 psi (0.69 MPa) min.
   E. Latex-Portland Cement Mortar should conform to the requirements of ANSI 118.04
F. Premixed mortar or by proportions recommended by the manufacturer of the latex polymer.
   1. Meeting the following minimum requirements:
      a. Compressive Strength (ANSI 118.4)………2500 psi (17.24 MPa) min.
      b. Bond Strength (ANSI 118.4)………………….150 psi (1.03 MPa) min.
2.03 POINTING MORTARS

A. Mortar used to grout or tuck-point mortar joints (sometimes called grouting mortars) between thin brick units after they are adhered to the substrate wall. Mix by proportion: 1 part Portland cement (ASTM C150); 1 part hydrated lime (ASTM C207); 6 parts sand (ASTM C144), or Modified Epoxy emulsion mortar/grout conforming to ANSI 118.07.
   1. Site mixed: Meet requirements of ASTM C270 Type N or Type S.
   2. Preblended: Meet requirements of ASTM C1714/C1714M Type S.

2.04 RIGID EXTERIOR INSULATION – SECTION 072113

A. Type and thickness as defined in the drawings
B. To be installed as part of the exterior adhered thin brick wall system outboard of the WRB
C. flashing
D. Corrosion resistant plastic, copper, stainless steel, painted metal, coated metal as shown on the drawings. See section 076000 for additional information.

2.05 ACCESSORIES

A. Weep screeds: Corrosion resistant with 3.5” (89mm) (minimum) vertical attachment flange (that terminates behind WRB)
   1. Metal weep screed: not less than 26 gage; .0179 inches (0.45mm)
   2. Plastic weep screed: not less than 0.05 inches (1.3mm)
B. Casing beads: Corrosion resistant
   1. Metal weep screed: not less than 26 gage; .0179 inches (0.45mm)
   2. Plastic weep screed: not less than 0.05 inches (1.3mm)
C. Elastomeric sealants. Sized for calculated movement. Section 079200
D. Fasteners: ASTM C1063
   1. For steel studs: corrosion resistant screws; coated or bi-metallic (mild [drill] tip with stainless threaded shank), for fastening drainage plane material and lath material to substrate wall; rated for resistance to moist environments. Penetrate stud to expose 3 full threads through steel studs
   2. For wood studs: corrosion resistant staples, corrosion resistant roofing nails, or corrosion resistant screws and washers, all of sufficient length to penetrate a minimum of ¾” into wall framing members
   3. For concrete or CMU: corrosion resistant concrete screws (with 1¼” minimum penetration into sound substrate) or corrosion resistant powder actuated fasteners (with 1” minimum penetration into sound substrate)
      a. Follow fastener manufacturer’s recommendations for installation into CMU
   4. Fasteners intended to secure lath shall have sufficiently large heads or added corrosion resistant washers large enough to not pull through the lath.
E. Fluid applied bond coat – used on the face of rigid insulation
F. Proprietary Lath Systems – follow manufacturer’s recommendations for installation
   1. Speedymason full bed panel system
   2. Thermoset reinforced plastic: Speedymason or equivalent
      a. Mortar set
G. Proprietary MVIS systems: exterior wall assembly system applied to clean and sound exterior substrate surfaces that has compatible components comprised of: liquid/fluid elastomeric WRB membrane, cementitious plaster substrate, setting/bonding mortar, and pointing mortar (grout) systems designed specifically for adhered exterior masonry veneers, including thin brick. Not applicable where it would be applied directly to a drainage layer.
   1. Laticrete MVIS or equivalent.
      a. 3-part system: fluid WRB + masonry veneer mortar + pointing mortar. Used for thin or thick set applications
b. 4-part system: fluid WRB + premium mortar bed + masonry veneer mortar + pointing mortar. Used in lieu of stucco substrates

PART 3 EXECUTION

3.01 VENEER SUBSTRATE PREPARATION

A. Concrete, CMU, Cement Backer Board, and Stucco
   1. Remove all deleterious substances (form release, curing compounds, paint, graffiti, etc.)
   2. Wash surface and allow to dry
   3. Cleaning may be waived/eliminated where proprietary lath systems are used, pending acceptance of Architect and lath system manufacturer.

B. Wood sheathing.
   1. Prepare to receive veneer assembly by properly setting all protruding fasteners and fixing fasteners that have punched through the exterior surface of the sheathing.
   2. Remove all deleterious materials from the surface of the sheathing.

3.02 EXTERIOR THICK SET APPLICATION FOR UNEVEN SUBSTRATES (CONCRETE, CMU AND UNEVEN WOOD SHEATHING)

A. The following guidelines are intended for exterior application over somewhat uneven substrates or when using thin brick with undulating/uneven back surfaces or thin bricks that vary in thickness.

B. Protect adjacent construction with appropriate means from mortar droppings and other effects of laying of brick masonry units.

C. Install flashing at the perimeter of thin brick veneer wall assembly, around openings, and at base of veneer, integrated with the WRB to prevent the moisture from entering the building and to transmit the moisture to the outside of the wall. Install weeps (weep screeds) at the bottom of the walls, integrated with the WRB to transmit the moisture to the outside face of the wall. Secure flashings with fasteners.

D. Install two layers of WRB sheet or roll goods over the substrate wall, in shingle fashion, starting at the bottom of the wall. The laps should be 2 in. (51 mm) minimum for horizontal laps and 6 in. (152 mm) minimum for vertical laps. Stagger laps in each layer, in shingle fashion. Secure in place with mastic, adhesive or fasteners. WRB may be reduced to a single layer where drainage layer is used; increase horizontal laps to 3” (76 mm) for single layer WRB sheet goods.
   1. Alternatively, apply liquid or fluid WRB to clean, sound substrate materials.

E. Where exterior insulation is intended, rigid insulation should be chosen, and it should be installed over the optional but recommended drainage layer, secured in place with appropriate fasteners.

F. Full bed lath panel according to manufacturers specifications. Provide expansion joints at changes in substrate, at 12'-0" O.C. maximum, and at 4'-0" from outside corners.

3.03 EXTERIOR THIN SET APPLICATION TO FLAT CEMENTITIOUS SUBSTRATE (CONCRETE, CMU, AND CEMENT BACKER BOARD [OVER FRAMED WALLS])

A. The following guidelines are intended for exterior application over reasonably flat substrates when using thin brick with uniform thickness.

B. Protect adjacent construction with appropriate means from mortar droppings and other effects of laying of brick masonry units.

C. Install flashing at the perimeter of thin brick veneer wall assembly, around openings, and at base of veneer, integrated with the WRB to prevent the moisture from entering the building and to transmit the moisture to the outside of the wall. Install weeps (weep screeds) at the bottom of the walls, integrated with the WRB to transmit the moisture to the outside face of the wall. Secure flashings with fasteners.

D. Apply liquid/fluid WRB membrane to clean concrete substrate surfaces.
1. If drainage layer is used, WRB may be single layer of sheet or roll goods. Lap sheet goods per 3.02 D.

E. Install optional (recommended) drainage layer over sheet or roll goods WRB or liquid/fluid elastomeric WRB. Avoid creating dams or terminations that would impede the flow of water and moisture out of the wall, directing it to the exterior surface. Secure in place with fasteners.

F. Where exterior insulation is intended, rigid insulation should be chosen, and it should be installed over the optional but recommended drainage layer, secured in place with appropriate fasteners.

G. Apply CBB over WRB sheet or roll goods (or liquid/fluid WRB) and over optional (recommended) drainage layer, and over exterior rigid insulation, where used. Secure cement backer board in place with appropriate fasteners. Tape joints.

H. Spread brick setting (bonding) mortar bed onto the clean and dust-free substrate of concrete or CMU with compatible elastomeric liquid/fluid WRB, or onto CBB over WRB and/or optional (recommended) drainage layer, using the flat side of a trowel and comb using a notched trowel (3/16" to ¼" [5 mm to 6 mm] deep notches) to obtain an even setting bed. Use Type S polymer modified mortar (Latex-Portland Cement Mortar, per 2.02-D-2, above).

I. Apply brick setting bed (bonding) mortar to the back of the veneer units, working into the back of the brick unit using the flat side of a trowel and comb using a notched trowel (as above) and place the unit into the setting bed on the substrate wall. Work the thin brick unit into place by tapping, or sliding slightly back-and-forth, or up-and-down, or rotating slightly, until excess mortar is squeezed out at the edges of the veneer unit, completely filling the space between unit and bonding mortar; 100% coverage on the thin brick units. The thickness of the mortar bed shall be between 3/8 in. and 1¼ in (10 mm and 32 mm).

J. Lay units to desired height with joints of uniform thickness. Grout the joints using Type N mortar mix per 2.03 above. Tool the joint when they are thumb print hard.

K. Bond shall be plumb throughout.

L. Lay units to avoid formation of cracks when units are placed.

M. Lay masonry plumb, true to line, with courses level. Keep bond pattern plumb throughout. Lay masonry within the tolerances of ACI 530.1 Section 3.3 G.

N. When positions of units shift after mortar has stiffened, when bond is broken, or when cracks are formed, remove and reinstall units in new mortar.

O. Avoid laying units where they would bridge active cracks or established movement joints in substrate materials. Cut where necessary to respect jointing in substrate.

P. Avoid mortar staining on the units during installation. Clean any mortar smearing or staining promptly to reduce final cleaning.

Q. Alternate 1: Proprietary lath systems (2.09-F) are suitable for this application in lieu of the setting/bonding mortar application noted above. Apply over WRB and optional (recommended) drainage layer, and over optional insulation. Where proprietary lath system has an integral drainage layer, additional drainage layer is not needed. Where proprietary lath system has integral insulation, additional insulation may not be necessary.

R. Alternate 2: Proprietary 3-part MVIS systems (2.09-G-1-a) may be used where no drainage layer is required, applied over concrete, CMU, or over CBB that is installed over (optional) drainage and insulation layers.

3.04 INTERIOR THIN SET APPLICATION TO FLAT SUBSTRATE (CONCRETE, CMU, AND CEMENT BACKER BOARD)

A. The following guidelines are intended for interior thin brick applications over reasonably flat substrates when using thin brick with uniform thickness. No drainage layer required. Intended for dry service interior applications.

B. Follow Section 3.03, for cementitious substrates (concrete of CMU)

C. Follow Section 3.03, for wood or exterior gypsum sheathing substrates.
D. A proprietary 3-part MVIS systems may be used, applied directly to wood or exterior gypsum sheathing, cement, CMU, or CBB substrates, for interior applications where no drainage layer is required.
E. A proprietary lath system, may be used in lieu of the above, applied directly to wood or exterior gypsum board sheathing, concrete, CMU, or CBB.

3.05 MORTAR JOINTS
A. Make joints straight, clean, smooth, and uniform in thickness.
B. Pointing: Tool exposed joints, slightly concave. Strike concealed joints flush.
C. Tool joints while slightly moist and thumbprint hard.
D. Joint Thickness: Make vertical and horizontal joints as required to achieve nominal dimensions on drawings and within tolerances listed in ACI 530.1.
E. Where fresh masonry joins totally or partially set masonry, clean and roughen set masonry before laying new units.

3.06 BOND PATTERN
A. Lay brick masonry units as indicated on the Drawings.

3.07 CUTTING BRICK MASONRY UNITS
A. When possible, use full units of the proper size in lieu of cut units.
B. Cut units as required to form chases, openings, for anchorage, and for other appurtenances, and at all movement joints and terminations, as required, so as to eliminate units bridging across movement joints (or cracks) in substrate.
C. Cut and fit units with power-driven carborundum or diamond disc blade saw.
D. Clean back of units after cutting to remove dust and other deleterious material(s).

3.08 CONTROL JOINTS / EXPANSION JOINTS
A. Size joints to accommodate anticipated movements with respect to moisture and thermal gradients in addition to building movements commensurate with the movement potential of the joint material(s).
B. Provide in masonry walls where indicated on the Drawings.
C. Make full height and continuous in appearance.
D. Control and expansion joints must be continuous through the backing, unless detailed otherwise.
E. Insert control joint filler in joints as wall is constructed.
F. Insert 50% compressible elastomeric (neoprene or equivalent) expansion joint material in properly sized expansion joints.
G. Apply sealant as specified in Section 079000.

3.09 FLASHING
A. Flashing must be installed at all through wall penetrations and at lower boundaries of the adhered thin brick veneer installations.
B. Flashings will be integrated with the WRB materials to provide effective control of moisture exiting the wall assembly, with sealed corners, end dams and other accessories as needed.

3.10 OTHER EMBEDDED ITEMS
A. Build in wall plugs, accessories, flashings, pipe sleeves, and other items required to be built-in as the masonry work progresses.

3.11 PATCHING
A. Patch exposed brick masonry units at completion of the Work and in such manner that patching will be indistinguishable from similar surroundings and adjoining construction.
3.12 MISCELLANEOUS
   A. Build in required items, such as anchors, flashings, weep screeds, sleeves, electrical boxes, frames, structural steel, lintels, anchor bolts, and metal fabrications, as required for complete installation.

3.13 WATER REPELLENT
   A. Apply water repellent as specified in Section 071900 where directed or specified on drawings.

3.14 FIELD QUALITY CONTROL
   A. Have minimum 3 masonry units of each type proposed for Project tested in accordance with ASTM C 67 to verify conformance to Specifications.
   B. Tests shall include absorption, Initial Rate of absorption and unit weight.
   C. Employ and pay acceptable independent testing laboratory to perform testing.

3.15 CLEANING
   A. Exercise extreme care to prevent mortar splotches.
   B. Do not attach construction supports to masonry walls.
   C. Wash off brick scum and grout spills before scum and grout set.
   D. Remove grout stains from walls using cleaning agent and methods recommended by brick manufacturer.
   E. Clean exposed masonry. Apply cleaning solution recommended by brick manufacturer in accordance with cleaning solution manufacturer's printed instructions and brick manufacturer's recommendations.
   F. Remove scaffolding and equipment. Dispose of debris, refuse, and surplus material offsite legally.
   G. Correct efflorescence on exposed surfaces with commercially prepared cleaning solution acceptable to masonry unit manufacturer.
   H. Do not use muriatic acid as cleaning solution.
   I. Do not use sandblast cleaning equipment.

3.16 PROTECTION
   A. Provide temporary protection for exposed masonry corners subject to damage.
   B. Limited Access Zone:
      1. Establish limited access zone prior to start of masonry wall construction.
      2. Zone shall be immediately adjacent to wall and equal to height of wall to be constructed plus 4 feet by entire length of wall on un-scaffolded side of wall.
      3. Limit access to zone to workers actively engaged in constructing wall. Do not permit other persons to enter zone.
      4. Keep zone in place until wall is adequately supported or braced by permanent supporting elements to prevent overturning and collapse.

END OF SECTION
SECTION 05 1200
STRUCTURAL STEEL FRAMING

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Structural steel framing members.
B. Structural steel support members and struts.
C. Base plates, shear stud connectors and expansion joint plates.
D. Grouting under base plates.

1.02 REFERENCE STANDARDS
G. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes; 2013.
M. ASTM F3125/F3125M - Standard Specification for High Strength Structural Bolts, Steel and Alloy Steel, Heat Treated, 120 ksi (830 MPa) and 150 ksi (1040 MPa) Minimum Tensile Strength, Inch and Metric Dimensions; 2015a.
Q. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination; 2012.
1.03 SUBMITTALS
   A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
   B. Shop Drawings:
      1. Indicate profiles, sizes, spacing, locations of structural members, openings, attachments, and fasteners.
      2. Connections not detailed.
      3. 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. Fabricator Test Reports: Comply with ASTM A1011/A1011M.

1.04 QUALITY ASSURANCE
   A. Fabricate structural steel members in accordance with AISC (MAN) "Steel Construction Manual."

PART 2 PRODUCTS
2.01 REGULATORY REQUIREMENTS
   A. Comply with UL (FRD) Assembly Design No. ____.

2.02 MATERIALS
   A. Steel Angles and Plates: ASTM A36/A36M.
   B. Steel W Shapes and Tees: ASTM A992/A992M.
   C. Rolled Steel Structural Shapes: ASTM A992/A992M.
   D. Cold-Formed Structural Shapes: ASTM A500/A500M, Grade B.
   E. Hot-Formed Structural Tubing: ASTM A501/A501M, seamless or welded.
   F. Shear Stud Connectors: Made from ASTM A108 Grade 1015 bars.
   G. Structural Bolts and Nuts: Carbon steel, ASTM A307, Grade A and galvanized in compliance with ASTM A153/A153M, Class C.
   H. High-Strength Structural Bolts, Nuts, and Washers: ASTM F3125/F3125M, Type 1, with matching compatible ASTM A563 or ASTM A563M nuts and ASTM F436/F436M washers.
   I. Tension Control Bolts: Twist-off type; ASTM F3125/F3125M.
   J. Unheaded Anchor Rods: ASTM F1554, Grade 36, plain, with matching ASTM A563 or ASTM A563M nuts and ASTM F436/F436M Type 1 washers.
   K. Headed Anchor Rods: ASTM F1554, Grade 36, plain.
   L. Load Indicator Washers: Provide washers complying with ASTM F959/F959M at connections requiring high-strength bolts.
   M. Welding Materials: AWS D1.1/D1.1M; type required for materials being welded.
   N. Grout: ASTM C1107/C1107M; Non-shrink; premixed compound consisting of non-metallic aggregate, cement, water reducing and plasticizing agents.
      1. Minimum Compressive Strength at 48 Hours: 2,000 pounds per square inch (13.7 MPa).
      2. Minimum Compressive Strength at 28 Days: 7,000 pounds per square inch (48 MPa).
   O. Shop and Touch-Up Primer: Fabricator's standard, complying with VOC limitations of authorities having jurisdiction.
   P. Touch-Up Primer for Galvanized Surfaces: Fabricator's standard, complying with VOC limitations of authorities having jurisdiction.

2.03 FABRICATION
   A. Shop fabricate to greatest extent possible.
   B. Space shear stud connectors as indicated on Structural Drawings.
   C. Continuously seal joined members by continuous welds. Grind exposed welds smooth.
D. Fabricate connections for bolt, nut, and washer connectors.
E. Develop required camber for members.

2.04 FINISH
A. Prepare structural component surfaces in accordance with SSPC-SP 3.

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 303.
B. Allow for erection loads, and provide sufficient temporary bracing to maintain structure in safe condition, plumb, and in true alignment until completion of erection and installation of permanent bracing.
C. Field weld components and shear studs indicated on shop drawings.
D. Use carbon steel bolts only for temporary bracing during construction, unless otherwise specifically permitted on drawings. Install high-strength bolts in accordance with RCSC (HSBOLT) "Specification for Structural Joints Using High-Strength Bolts".
E. 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. Trowel grouted surfaces smooth, splaying neatly to 45 degrees.

3.03 TOLERANCES
A. Maximum Variation From Plumb: 1/4 inch (6 mm) per story, non-cumulative.
B. Maximum Offset From True Alignment: 1/4 inch (6 mm).

3.04 FIELD QUALITY CONTROL
A. An independent testing agency will perform field quality control tests, as specified in Section 01 4000 - Quality Requirements.

END OF SECTION
SECTION 05 2100
STEEL JOIST FRAMING

PART 1 GENERAL

1.01 SECTION INCLUDES
   A. Open web steel joists and shear stud connectors, with bridging, attached seats and anchors.
   B. Loose bearing members, such as plates or angles, and anchor bolts for site placement.
   C. Supplementary framing for floor and roof openings greater than 12 inches (____ mm).

1.02 REFERENCE STANDARDS
   I. SSPC-Paint 15 - Steel Joist Shop Primer/Metal Building Primer; 1999 (Ed. 2004).

1.03 SUBMITTALS
   A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
   B. Shop Drawings: Indicate standard designations, joist coding, configurations, sizes, spacings, cambers, locations of joists, joist leg extensions, bridging, connections, and attachments.
   C. Welders' Certificates: Submit manufacturer's certificates, certifying welders employed on the Work, verifying AWS qualification within the previous 12 months.
   D. Manufacturer's Qualification Statement.

1.04 QUALITY ASSURANCE
   A. Design connections not detailed on drawings under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed in Utah.

PART 2 PRODUCTS

2.01 MATERIALS
   A. Open Web Joists: Types as indicated on drawings:
      1. Provide top chord extensions as indicated.
      2. Minimum End Bearing on Steel Supports: Comply with referenced SJI standard.
      3. Minimum End Bearing on Concrete or Masonry Supports: Comply with referenced SJI standard.
      4. Finish: Shop primed.
   C. Shear Stud Connectors: Made from ASTM A108 Grade 1015 bars.
D. Structural Steel For Supplementary Framing and Joist Leg Extensions: ASTM A36/A36M.
E. Welding Materials: AWS D1.1/D1.1M; type required for materials being welded.
F. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.
G. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20, Type I - Inorganic, 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. Galvanize joists as specified.
B. Prepare surfaces to be finished in accordance with SSPC-SP 2.
C. Galvanizing: Provide minimum 1.7 oz/sq ft (530 g/sq m) galvanized coating to ASTM A123/A123M requirements.

2.04 SOURCE QUALITY CONTROL
A. Provide shop testing of steel components.

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. Coordinate the placement of anchors for securing loose bearing members furnished as part of the work of this section.
D. After joist alignment and installation of framing, field weld joist seats to steel bearing surfaces.
E. Position and field weld joist chord extensions and wall attachments as detailed.
F. Install supplementary framing for roof openings greater than 18 inches (450 mm).
G. 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.
H. Do not field cut or alter structural members without approval of joist manufacturer.
I. 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 (6 mm).
B. Maximum Offset From True Alignment: 1/4 inch (6 mm).

3.04 FIELD QUALITY CONTROL
A. An independent testing agency will perform field quality control tests, as specified in Section 01 4000 - Quality Requirements.
B. as noted on the Structural Drawings.

END OF SECTION
SECTION 05 3100
STEEL DECKING

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Roof deck.
B. Composite floor deck.
C. Bearing plates and angles.

1.02 RELATED REQUIREMENTS
A. Section 05 1200 - Structural Steel Framing: Support framing for openings larger than 12 inches (____ mm) and shear stud connectors.
B. Section 05 2100 - Steel Joist Framing: Support framing for openings larger than 12 inches (____ mm).

1.03 REFERENCE STANDARDS
I. SSPC-Paint 15 - Steel Joist Shop Primer/Metal Building Primer; 1999 (Ed. 2004).

1.04 SUBMITTALS
A. See Section 01 3000 - Administrative Requirements, for submittals procedures.
B. Shop Drawings: Indicate deck plan, support locations, projections, openings, reinforcement, pertinent details, and accessories.
C. Certificates: Certify that products furnished meet or exceed specified requirements.
D. Submit manufacturer's installation instructions.
E. Welders Certificates: Certify welders employed on the Work, verifying AWS qualification within the previous 12 months.
F. Fabricator's Qualification Statement: Provide documentation showing steel fabricator is accredited under IAS AC172.

1.05 QUALITY ASSURANCE
A. Fabricator Qualifications: A qualified steel fabricator that is accredited by the International Accreditation Service (IAS) Fabricator Inspection Program for Structural Steel in accordance with IAS AC172.
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:
   4. Substitutions: See Section 01 6000 - Product Requirements.

2.02 STEEL DECK

A. See Structural Notes on drawings.

B. Roof Deck: Non-composite type, fluted steel sheet:
   1. Galvanized Steel Sheet: ASTM A653/A653M, Structural Steel (SS) Grade 50/340, Class 1, 2, or 4, with G90/Z275 galvanized coating.
   2. Primer: Shop coat of manufacturer's standard primer paint over cleaned and phosphatized substrate.
   3. Structural Properties:
      a. See Structural Notes on drawings.
   4. Minimum Base Metal Thickness: 22 gage, 0.0299 inch (0.76 mm).
   5. Nominal Height: 1-1/2 inch (38 mm).
   6. Profile: Fluted; SDI NR.
   7. Formed Sheet Width: 36 inch (900 mm).
   8. Side Joints: As indicated on Structural Drawings.
   9. End Joints: As indicated on Structural Drawings.

C. Composite Floor Deck: Fluted steel sheet embossed to interlock with concrete:
   1. Galvanized Steel Sheet: ASTM A653/A653M, Structural Steel (SS) Grade 50/340, Class 1, 2, or 4, with G90/Z275 galvanized coating.
   2. Primer: Shop coat of manufacturer's standard primer paint over cleaned and phosphatized substrate.
   3. Structural Properties:
      a. See Structural Notes on drawings.
   4. Minimum Base Metal Thickness: 20 gage, 0.0359 inch (0.91 mm).
   5. Nominal Height: 3 inches (76 mm).
   6. Profile: Fluted; SDI NR.
   7. Formed Sheet Width: 36 inch (900 mm).
   8. Side Joints: As indicated on Structural Drawings.
   9. End Joints: As indicated on Structural Drawings.

2.03 ACCESSORY MATERIALS

A. Bearing Plates and Angles: ASTM A36/A36M steel, unfinished.

B. Stud Shear Connectors: Made from ASTM A108 Grade 1015 bars.

C. Welding Materials: AWS D1.1/D1.1M.

D. Fasteners: Galvanized hardened steel, self tapping.

E. Mechanical Fasteners: Steel; hex washer head, self-drilling, self-tapping.
   1. Fasteners for Steel Roof Decks Protected with Waterproofing Membrane: ASTM B633, SC1, Type III zinc electroplate.

F. Weld Washers: Mild steel, uncoated, 3/4 inch (19 mm) outside diameter, 1/8 inch (3 mm) thick.

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, complying with VOC limitations of authorities having jurisdiction.
I. Flute Closures: Closed cell foam rubber, 1 inch (25 mm) thick; profiled to fit tight to the deck.

2.04 FABRICATED DECK ACCESSORIES
A. Sheet Metal Deck Accessories: Metal closure strips, wet concrete stops, and cover plates, 22 gage, 0.0299 inch (0.76 mm) thick sheet steel; of profile and size as indicated; finished same as deck.
B. Roof Sump Pans: Formed sheet steel, 14 gage, 0.0747 inch (1.90 mm) minimum thickness, flat bottom, sloped sides, recessed 1-1/2 inches (38 mm) below roof deck surface, bearing flange 3 inches (75 mm) wide, sealed watertight.

PART 3 EXECUTION
3.01 EXAMINATION
A. Verify existing conditions prior to beginning work.

3.02 INSTALLATION
A. Erect metal deck in accordance with SDI Design Manual. Align and level.
B. On concrete and masonry surfaces provide minimum 4 inch (100 mm) bearing.
C. On steel supports provide minimum 1-1/2 inch or 2 inch bearing.
D. Fasten deck to steel support members at ends and intermediate supports, See Structural Notes on drawings.
E. Clinch lock seam side laps.
F. At male/female side laps fasten at 24 inches (600 mm) on center maximum.
G. Drive mechanical sidelap connectors completely through adjacent lapped sheets; positively engage adjacent sheets with minimum three-thread penetration.
H. At male/female side laps weld at 18 inches (450 mm) on center maximum.
I. Weld deck in accordance with AWS D1.3/D1.3M.
J. At deck openings from 6 inches (150 mm) to 12 inches (300 mm) in size, provide reinforcement per the structural drawings.
K. At deck openings greater than 18 inches in size, provide steel angle reinforcement as specified in Section 05 1200.
L. Where deck (other than cellular deck electrical raceway) changes direction, install 6 inch (150 mm) minimum wide sheet steel cover plates, of same thickness as deck. Fusion weld 12 inches (300 mm) on center maximum.
M. At floor edges, install concrete stops upturned to top surface of slab, to contain wet concrete. Provide stops of sufficient strength to remain stationary without distortion.
N. At openings between deck and walls, columns, and openings, provide sheet steel closures and angle flashings to close openings.
O. Close openings above walls and partitions perpendicular to deck flutes with single row of foam cell closures.
P. Place metal cant strips in position and fusion weld.
Q. Position roof drain pans with flange bearing on top surface of deck. Fusion weld at each deck flute.
R. Position floor drain pans with flange bearing on top surface of deck. Fusion weld at each deck flute.
S. Weld stud shear connectors through steel deck to structural members below.
T. Immediately after welding deck and other metal components in position, coat welds, burned areas, and damaged surface coating, with touch-up primer.

END OF SECTION
SECTION 05 5000
METAL FABRICATIONS

PART 1 GENERAL

1.01 SECTION INCLUDES
   A. Shop fabricated steel items.

1.02 REFERENCE STANDARDS

1.03 SUBMITTALS
   A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
   B. Shop Drawings: Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories. Include erection drawings, elevations, and details where applicable.

PART 2 PRODUCTS

2.01 MATERIALS - STEEL
   A. Steel Sections: ASTM A36/A36M.
   B. Steel Tubing: ASTM A501/A501M hot-formed structural tubing.
   C. Plates: ASTM A283/A283M.
   E. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20, Type I - Inorganic, complying with VOC limitations of authorities having jurisdiction.

2.02 FABRICATION
   A. Fit and shop assemble items in largest practical sections, for delivery to site.
   B. Fabricate items with joints tightly fitted and secured.
   C. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.
   D. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.

2.03 FABRICATED ITEMS
   A. Bollards: Steel pipe, concrete filled, crowned cap, as detailed; prime paint finish.
   B. Ledge Angles, Shelf Angles, Channels, and Plates Not Attached to Structural Framing: For support of metal decking; prime paint finish.
   C. Lintels: As detailed; prime paint finish.
D. Recessed Mat Frames: As detailed; steel, galvanized finish.

**2.04 FINISHES - STEEL**

A. Prime paint steel items.
   1. Exceptions: Galvanize items to be embedded in concrete, items to be embedded in masonry, and items specified for _______ finish.
   2. Exceptions: Do not prime surfaces in direct contact with concrete, where field welding is required, and items to be covered with sprayed fireproofing.

B. Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.
C. Prime Painting: One coat.

**2.05 FABRICATION TOLERANCES**

A. Squareness: 1/8 inch (3 mm) maximum difference in diagonal measurements.
B. Maximum Offset Between Faces: 1/16 inch (1.5 mm).
C. Maximum Misalignment of Adjacent Members: 1/16 inch (1.5 mm).
D. Maximum Bow: 1/8 inch (3 mm) in 48 inches (1.2 m).
E. Maximum Deviation From Plane: 1/16 inch (1.5 mm) in 48 inches (1.2 m).

**PART 3 EXECUTION**

**3.01 EXAMINATION**

A. Verify that field conditions are acceptable and are ready to receive work.

**3.02 PREPARATION**

A. Clean and strip primed steel items to bare metal where site welding is required.
B. Supply setting templates to the appropriate entities for steel items required to be cast into concrete or embedded in masonry.

**3.03 INSTALLATION**

A. Install items plumb and level, accurately fitted, free from distortion or defects.
B. Provide for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.
C. Perform field welding in accordance with AWS D1.1/D1.1M.
D. Obtain approval prior to site cutting or making adjustments not scheduled.
E. After erection, prime welds, abrasions, and surfaces not shop primed or galvanized, except surfaces to be in contact with concrete.

**3.04 TOLERANCES**

A. Maximum Variation From Plumb: 1/4 inch (6 mm) per story, non-cumulative.
B. Maximum Offset From True Alignment: 1/4 inch (6 mm).
C. Maximum Out-of-Position: 1/4 inch (6 mm).

END OF SECTION
SECTION 05 5100
METAL STAIRS

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Stairs with poured in place concrete pan treads.
B. Stairs with polished precast concrete treads.
C. Structural steel stair framing and supports.
D. Handrails and guards.

1.02 RELATED REQUIREMENTS
A. Section 03 3000 - Cast-in-Place Concrete: Concrete fill in stair pans; mesh reinforcement for landings.
B. Section 03 3000 - Cast-in-Place Concrete: Placement of metal anchors in concrete.
C. Section 04 2000 - Unit Masonry: Placement of metal fabrications in masonry.
D. Section 05 5213 - Pipe and Tube Railings: Metal handrails for the stairs specified in this section.
E. Section 09 9123 - Interior Painting: Paint finish.

1.03 REFERENCE STANDARDS
F. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes; 2013.
J. ASTM F3125/F3125M - Standard Specification for High Strength Structural Bolts, Steel and Alloy Steel, Heat Treated, 120 ksi (830 MPa) and 150 ksi (1040 MPa) Minimum Tensile Strength, Inch and Metric Dimensions; 2015a.
K. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination; 2012.
M. SSPC-Paint 15 - Steel Joist Shop Primer/Metal Building Primer; 1999 (Ed. 2004).

1.04 SUBMITTALS
A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Shop Drawings: Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories.
   1. Indicate welded connections using standard AWS A2.4 welding symbols. Indicate net weld lengths.
   2. Include the design engineer’s seal and signature on each sheet of shop drawings.

C. Design Data: As required by authorities having jurisdiction.

D. Welders' Certificates.

1.05 QUALITY ASSURANCE

A. Structural Designer Qualifications: Professional Structural Engineer experienced in design of this work and licensed in Utah, or personnel under direct supervision of such an engineer.

B. Welder Qualifications: Show certification of welders employed on the Work, verifying AWS qualification within the previous 12 months.

C. Fabricator Qualifications:
   1. A company specializing in manufacturing products specified in this section, with not less than ten 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 Contract Documents exceed those of regulations, comply with 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.
   8. Final stair design shall include the engineers stamp and complete calculations for deferred submittal.

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.
   2. Industrial: All joints made neatly.
      a. Welded Joints: Welded on back side wherever possible.
      b. Welds Exposed to Touch: Ground smooth.
      c. Bolts Exposed to Touch in Travel Area: No nuts or screw threads exposed to touch.

C. Fasteners: Same material or compatible with materials being fastened; type consistent with design and specified quality level.

D. Anchors and Related Components: Same material and finish as item to be anchored, except where specifically indicated otherwise; provide all anchors and fasteners required.

2.02 METAL STAIRS WITH CONCRETE TREADS

A. Jointing and Finish Quality Level: Industrial, as defined above.
B. Risers: Closed.

C. Treads: Metal pan with field-installed concrete fill at basement stairs and Stair 166.
   1. Concrete Depth: 1-1/2 inches (38 mm), minimum at pan stairs and 2" at precast concrete treads.
   2. Tread Pan Material: Steel sheet.
   3. Tread Pan Thickness: As required by design; 14 gage, 0.075 inch (1.9 mm) minimum.
   4. Pan Anchorage to Stringers: Welded or bolted to carrier angles welded or bolted to stringers.
   5. Concrete Reinforcement: Welded wire mesh.
   6. Concrete Finish:
      a. For resilient floor covering at poured in place concrete pan.
      b. Polished at precast concrete treads.

D. Risers: Same material and thickness as tread pans.
   1. Nosing Depth: As indicated on the drawings.
   2. Nosing Return: Flush with top of concrete fill, not more than 1/2 inch (12 mm) wide.

E. Stringers: Rolled steel channels at basement stairs and tubs steel at other stairs.
   1. Stringer Depth: 10 inches (250 mm).
   2. End Closure: Sheet steel of same thickness as risers welded across ends.

F. Landings: Similar construction, using corrugated steel decking, supported and reinforced as required to achieve design load capacity.

G. Railings: Stainless steel picket railings as indicated on the drawings.

H. Finish: Shop- or factory-prime painted.

2.03 Handrails and Guards

2.04 Materials

A. Steel Sections: ASTM A36/A36M.

B. 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).

C. Concrete Fill: Portland cement Type I, 3000 psi (20 MPa) 28 day strength, 2 to 3 inch (50 to 75 mm) slump.

D. Concrete Reinforcement: Mesh type as detailed, galvanized.

2.05 Accessories

A. Steel Bolts, Nuts, and Washers: ASTM F3125/F3125M, Type 1, and galvanized to ASTM A153/A153M where connecting galvanized components.

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. 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 (6 mm) per story, non-cumulative.
   B. Maximum Offset From True Alignment: 1/4 inch (6 mm).

END OF SECTION
SECTION 05 5134
ALTERNATING TREAD STAIRS

PART 1 GENERAL
1.01 SECTION INCLUDES
A. Aluminum Alternating Tread Stairs.

1.02 REFERENCES

1.03 SUBMITTALS
A. Submit under provisions of Section 01 30 00.
B. Manufacturer's data sheets on each product to be used, including:
   1. Preparation instructions and recommendations.
   2. Storage and handling requirements and recommendations.
C. Shop Drawings for Stairs:
   1. Plan and section of stair installation.

1.04 DELIVERY, STORAGE, AND HANDLING
A. Store products in manufacturer's unopened packaging until ready for installation.
B. Store stair until installation inside under cover. If stored outside, under a tarp or suitable cover.

1.05 WARRANTY
A. Limited Warranty: Five years against defective material and workmanship, covering parts only, no labor or freight. Defective parts, if deemed so by the manufacturer, will be replaced at no charge, freight excluded, upon inspection at manufacturer's plant which warrants same.

PART 2 PRODUCTS
2.01 MANUFACTURERS
A. Basis of Design: Precision Ladders, LLC, which is located at: P. O. Box 2279; Morristown, TN 37816-2279; Toll Free Tel: 800-225-7814; Tel: 423-586-2265; Fax: 423-586-2091; Web: www.PrecisionLadders.com
B. Requests for substitutions will be considered in accordance with provisions of Section 01 60 00.

2.02 ALUMINUM ALTERNATING TREAD STAIR
A. Aluminum Alternating Tread Stair and Components: Stair, mounting brackets and handrails on both sides.
   1. Model: Model AT -XX (XX= vertical height in inches) Aluminum Alternating Tread Stair as manufactured by Precision Ladders, LLC.
   2. Capacity: Unit shall support a 1,000 lb (227 kg) total load without failure.
   3. Degree of Incline: 56 or 68 degrees.
   4. Performance Standard: Units designed and manufactured to meet or exceed OSHA 1910.25.
B. Components:
   1. Stair Side Stringers: 3 inch by 2 inch by 1/8 inch (76 mm by 51 mm by 3 mm) extruded 6005-T5 aluminum tubing. Pitch: 56 or 68 degrees.
   2. Stair Center Stringer: 10 inch by 1/4 inch (254 mm by 6 mm) extruded 6005-T5 aluminum flat bar. Note: Neoprene trim adhered to front edge of center stringer to protect climber.
   3. Stair Treads: 1 inch aluminum Bar Grating, 9 13/16" (249 mm) deep by 9 7/8"(250 mm) wide on hatch-access models (11 7/8" (302 mm) wide on Walk-thru models).
   4. Stair Mounting Brackets: 6 inch by 1/4 inch (153 mm by 6 mm) aluminum flat bar
   5. Handrails: 1-1/4 inches (32 mm) Schedule 40, 6005-T5 aluminum pipe provided with internal aluminum fittings.
   6. Finishes:
2.03 FABRICATION
   A. Completely fabricate stair ready for installation before shipment to the site.

PART 3 EXECUTION

3.01 EXAMINATION
   A. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
   B. Examine materials upon arrival at site. Notify the carrier and manufacturer of any damage.

3.02 INSTALLATION
   A. Install in accordance with approved submittals.

3.03 PROTECTION
   A. Protect installed products until completion of project.
   B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION
SECTION 05 5135
LADDERS

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Aluminum access ladders.

1.02 REFERENCES
A. AA – Aluminum Association.
D. OSHA 1910.27 – Fixed Ladders.

1.03 SUBMITTALS
A. Submit under provisions of Section 01300.
B. Product Data: Manufacturer's data sheets on each product.
C. Shop Drawings:
   1. Detail fabrication and erection of each ladder indicated. Include plans, elevations, sections, and details of metal fabrications and their connections.
   2. Provide templates for anchors and bolts specified for installation under other Sections.
   3. Provide reaction loads for each hanger and bracket.
D. Qualification Data:
   1. Refer to Quality Assurance provisions for submittal requirements evidencing experience, certifications and resources.
E. Selection Samples: For each finish specified, two complete sets of color chips representing manufacturer's full range of available colors.
F. Verification Samples: For each finish specified, two samples, minimum size 6 inches (150 mm) square, represent actual product color.

1.04 QUALITY ASSURANCE
A. Manufacturer Qualifications: A firm experienced in producing aluminum metal ladders similar to those indicated for this Project.
   1. Record of successful in-service performance.
   2. Sufficient production capacity to produce required units.
   3. Professional engineering competent in design and structural analysis to fabricate ladders in compliance with industry standards and local codes.
B. Installer Qualifications: Competent and experienced firm capable of selecting fasteners and installing ladders to attain designed operational and structural performance.
C. Product Qualification: Product design shall comply with OSHA 1910.27 minimum standards for ladders.
D. Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.
   1. Install ladder in area designated by Architect.
   2. Do not proceed with remaining work until workmanship and installation are approved by architect.
   3. Rework mock-up as required to produce acceptable work.

1.05 DELIVERY, STORAGE, AND HANDLING
A. Store products in manufacturer's unopened packaging until ready for installation.

1.06 PROJECT CONDITIONS
A. Field Measurements: Verify dimensions by field measurement before fabrication.
1. Established Dimensions: Where field measurements cannot be made without delaying the Work, indicate established dimensions on shop drawing submittal and proceed with fabrication.

1.07 WARRANTY
A. Manufacturer has responsibility for an extended Corrective Period for work of this Section for a period of 5 years commencing on the shipment date of the product against all the conditions indicated below, and when notified in writing from Owner, manufacturer shall promptly and without inconvenience and cost to Owner correct said deficiencies.
   1. Defects in materials and workmanship.
   2. Deterioration of material and surface performance below minimum OSHA standards as certified by independent third party testing laboratory. Ordinary wear and tear, unusual abuse or neglect excepted.
   3. Within the warranty period, the manufacturer shall, at its option, repair, replace, or refund the purchase price of defective ladder.
B. Manufacturer shall be notified immediately of defective products, and be given a reasonable opportunity to inspect the goods prior to return. Manufacturer will not assume responsibility, or compensation, for unauthorized repairs or labor. Manufacturer makes no other warranty, expressed or implied, to the merchantability, fitness for a particular purpose, design, sale, installation, or use, of the ladder; and shall not be liable for incidental or consequential damages, losses of or expenses, resulting from the use of ladder products.

1.08 EXTRA MATERIALS
A. Furnish touchup kit for each type and color of paint finish provided.

PART 2 PRODUCTS
2.01 MANUFACTURERS
A. Basis of Design: O'Keeffe's, Inc.; 100 N Hill Drive, Suite 12, Brisbane, CA 94005. Toll Free Tel: (888) 653-3333. Tel: (415) 824-4900. Fax: (415) 824-5900. Email: info@okeeffes.com. Web: http://www.okeeffes.com. 
B. Requests for substitutions will be considered in accordance with provisions of Section 01600.

2.02 APPLICATIONS/SCOPE
A. Fixed Access Ladder:
      a. Model 500 as manufactured by O'Keeffe's Inc.

2.03 FINISHES
A. Mill finish. As extruded.
   1. Clear Anodic Finish: AA-M10C22A41 Mechanical finish as fabricated. Architectural Class I, clear coating 0.018 mm or thicker.

2.04 MATERIALS
A. Aluminum Sheet: Alloy 5005-H34 to comply with ASTM B209.
B. Aluminum Extrusions: Alloy 6063-T6 to comply with ASTM B221.

2.05 FABRICATION
A. Rungs: Not less than 1-1/4 inches (32 mm) in section and 18–3/8 inches (467mm) long, formed from tubular aluminum extrusions. Squared and deeply serrated on all sides.
   1. Rungs shall withstand a 1,500 pound (454 kg) load without deformation or failure.
B. Channel Side Rails: Not less than 1/8 inch (3 mm) wall thickness by 3 inches (76 mm) wide.
C. Heavy Duty Tubular Side Rails: Assembled from two interlocking aluminum extrusions no less than 1/8 inch (3 mm) wall thickness by 3 inches (76 mm) wide. Construction shall be self-locking stainless steel fasteners, full penetration TIG welds and clean, smooth and burr-free surfaces.
2.06 ACCESSORIES
   A. Ladder Safety Post: Retractable hand hold and tie off.
   B. Fall Arrest System: Provide Honeywell, Gridloc Fall Arrest System.

PART 3 EXECUTION

3.01 EXAMINATION
   A. Coordinate anchorages. Furnish setting drawings, templates, and anchorage structural loads for fastener resistance.
   B. Do not begin installation until supporting structure is complete and ladder installation will not interfere with supporting structure work.
   C. If supporting structure is the responsibility of another installer, notify Architect of unsatisfactory supporting work before proceeding.

3.02 INSTALLATION
   A. INSTALL IN ACCORDANCE WITH MANUFACTURER’S INSTRUCTIONS AND IN PROPER RELATIONSHIP WITH ADJACENT CONSTRUCTION.

3.03 PROTECTION
   A. Protect installed products until completion of project.
   B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION
SECTION 05 5200
STEEL PIPE AND TUBE RAILINGS

PART 1- GENERAL

1.01 SUMMARY
A. This section includes both standard and custom handrails as shown in the contract drawings.
B. These include stainless steel pipe railings.
C. Floor Mount Removable Safety Guardrail system at mezzanine for maintenance access.

1.02 REFERENCES
A. ASTM A167- Standard Specification for stainless and heat resisting chromium nickel steel plate, sheet and strip
B. ASTM A312- Standard Specification for seamless and welded austenitic stainless steel pipe
C. AWS D1.1- Structural Welding Code Steel; 2008
D. AWS D1.2- Structural Welding Code Aluminum; 2003
E. AWS D1.6- Structural Welding Code Stainless Steel; 2007
F. AWS B2.1-84- Welding procedure and performance calculations
G. ASTM E894- Standard Test Methods for anchorage of permanent metal railing systems and rails for buildings
H. ASTM E935- Standard Test Methods for performance of permanent metal railing systems and rails for buildings
I. ASTM E985- Specifications for permanent metal railing systems and rails for buildings
J. NOMMA- Metal finishes manual

1.03 PERFORMANCE REQUIREMENTS
A. Handrail shall be designed to withstand without permanent deflection the following loads:
   1. Top Rail-
      a. Concentrated load of 200 lb/ft applied at any point and any direction.
      b. Uniform load of 50 lb/ft applied horizontally and concurrently with uniform load of 100 lb/ft applied vertically downward.
      c. Concentrated and uniform loads above need not be assumed to act concurrently.
   2. Hand Rails other than top rail-
      a. Concentrated load of 200 lb/ft applied at any point and any direction.
      b. Uniform load of 50 lb/ft applied in any direction.
      c. Concentrated and uniform loads above need not be assumed to act concurrently.
   3. Infill areas-
      a. Concentrated horizontal load 50 lb/ft applied to 1 sq. ft. at any point is system, including intermediate rails, panels, pickets, cables or other elements making up infill area. Loads need not be assumed to act concurrently with loads on top rails in determining stress on infill.

1.04 SUBMITTALS
A. Shop drawings which specify material sizes, shapes, plans, sections, install details and finishes per requirements.
B. Product data for rail systems and finishes.
C. Welder certifications.
D. Samples of rail materials and finish.
E. Mock ups as required (pricing available on request).
F. Structural calculations and testing (pricing available on request).
G. One year manufacturer’s warranty for materials and installation at project completion.
H. Forward warranty on finish; when applicable; to owner at project completion.

1.05 QUALITY ASSURANCE
   A. Obtain railing through one source from a single manufacturer.
   B. Check dimensions of other construction by accurate field measurements before fabrication to
      insure proper rail fit up. Incorporate final dimensions into field use shop drawings. Coordinate
      fabrication lead times with construction progress to avoid delaying the work.
   C. Shop assembled mechanical joints shall fit to within 1/16”.
   D. Expansion joints shall fit within 1/8” to allow for thermal expansion within the handrail.
   E. Railing posts shall be plumb to within 1/8” over 3’-0’.
   F. Qualify welders and procedures per AWS standard qualification procedures.

1.06 DELIVERY, STORAGE AND HANDLING
   A. Materials to be delivered to job site crated and packaged to prevent damage.
   B. Store material on site in manufacturers unopened packaging until ready to install.
   C. Store material in a clean dry location avoiding exposure to uncured concrete, masonry or acidic
      cleaning agents.

PART 2 –PRODUCTS

2.01 MATERIALS
   A. Provide metal free from pitting, seam marks, roller marks, grinding marks and stains at areas
      exposed to view on completed rail units.
      1. Stainless Steel
         a. Pipe and tubing: ASTM A 269 Type 304 or Type 316.
         b. Fittings: ASTM A 276/ A 479 Type 304 or Type 316.

2.02 FINISHES
   A. Stainless Steel
      1. #4 (180 grit) directional.

2.03 FABRICATION
   A. Fabricate handrails and guardrails in accordance to approved shop drawing and field
      dimensions using mitered and welded joints with bends where indicated on shop drawings.
   B. Shop fabricate in greatest possible lengths to eliminate field splicing, but not to exceed 20’-0” in
      length.
   C. Form bends to uniform radius, free of distortion, twists, cracks and grain separation.
   D. Top rails shall be continuous over posts for strength with splices for expansion located within 6
      to 12 inches of post.
   E. Splices and expansion joints shall utilize internal splice connectors with set screws to allow for
      rail expansion over ambient temperature change.
   F. Weld all shop assembled connections continuous without undercut and or distortion of rail
      materials.
   G. Grind and or dress exposed welds smooth and flush to corner or fillet without weakening rail
      connection.
   H. Remove all burrs and sharp edges from exposed ends of final rail assemblies.
   I. Lightly sand and blend with fine grit paper all light scratches prior to rail finishing.
   J. Provide drainage and weep holes within rail assemblies to prevent entrapment of water within
      rail assemblies. Note that caution should be used when pressure washing rails assemblies to
      prevent water entry to non-vented areas under pressure.
   K. Provide compatible radius anchor for surface mounting typical.
2.04 FLOOR MOUNT REMOVABLE SAFETY GUARDRAIL SYSTEM
   A. Manufacturer: Safety Rail Company; safetyrailcompany.com
   B. Color: Powder coat Safety Yellow
   C. Location: Mezzanine for maintenance access

PART 3- EXECUTION

3.01 EXAMINATION
   A. Verify that field conditions are acceptable and ready to receive work.

3.02 INSTALLATION
   A. Install in accordance with shop drawings utilizing established working points.
   B. Set railings with anchor bolts. Maintain slab edge distances and rail locations per shop drawings.
   C. Assemble rails fitting splices together to form tight hairline joints while allowing for thermal expansion as required.
   D. Make all adjustments to alignment for satisfactory rail appearance and to plumb posts prior to final tightening of fasteners or pouring of holes.
   E. Locate wall brackets per shop drawings and set anchors within concrete or into blocking within sheetrock walls. Use wall rails to insure proper location and plumb at ends.
   F. Install wall rail onto brackets using fasteners supplied per the drawings.
   G. After installation is complete clean product using non-abrasive mild soap and water. Do not utilize any cleaners containing any type of acid.
   H. Use touch up paint and touch up kit to repair any areas damaged during installation.

END OF SECTION
STEEL PIPE AND TUBE RAILINGS
SECTION 06 1000
ROUGH CARPENTRY

PART 1  GENERAL

1.01  SECTION INCLUDES (SEE STRUCTURAL SHEET NOTES)
A. Non-structural dimension lumber framing.
B. Sheathing.
C. Roof-mounted curbs.
D. Roofing nailers.
E. Preservative treated wood materials.
F. Miscellaneous framing and sheathing.
G. Concealed wood blocking, nailers, and supports.

1.02  RELATED REQUIREMENTS
A. Section 05 1200 - Structural Steel Framing: Prefabricated beams and columns for support of wood framing.
B. Section 05 5000 - Metal Fabrications: Miscellaneous steel connectors and support angles for wood framing.
C. Section 07 2500 - Weather Barriers: Water-resistive barrier over sheathing.
D. Section 07 6200 - Sheet Metal Flashing and Trim:
E. Section 09 2116 - Gypsum Board Assemblies: Gypsum-based sheathing.

1.03  REFERENCE STANDARDS

1.04  SUBMITTALS
A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide technical data on wood preservative materials.

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.

1.06  WARRANTY
A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

PART 2  PRODUCTS

2.01  GENERAL REQUIREMENTS
A. Dimension Lumber: Comply with PS 20 and requirements of specified grading agencies.
   1. Species: Douglas Fir, unless otherwise indicated. See structural dwgs
   2. Grading Agency: Any grading agency whose rules are approved by the Board of Review, American Lumber Standard Committee (www.alsc.org) and who provides grading service for the species and grade specified; provide lumber stamped with grade mark unless otherwise indicated.

2.02  DIMENSION LUMBER
A. Sizes: Nominal sizes as indicated on drawings, S4S.
B. Moisture Content: S-dry or MC19.
C. Stud Framing (2 by 2 through 2 by 6 (50 by 50 mm through 50 by 150 mm)):
   1. Grade: No. 2. or better
D. Joist, Rafter, and Small Beam Framing (2 by 6 through 4 by 16 (50 by 150 mm through 100 by 400 mm)):  
  1. Machine stress-rated (MSR) as follows:  
  2. Species: Douglas Fir.  
E. Miscellaneous Framing, Blocking, Nailers, Grounds, and Furring:  
  1. Lumber: S4S, No. 2 or Standard Grade.  
  2. Boards: Standard or No. 3.

2.03 CONSTRUCTION PANELS  
A. Wall Sheathing: 5/8” Glass Matte Sheathing

2.04 ACCESSORIES  
A. Fasteners and Anchors:  
B. Water-Resistive Barrier: As specified in Section 07 2500.

2.05 UNDERLAYMENT:  
A. Self adhering sheet underlaymentpolyethylene faced (ice and water shield): ASTM D 1970, min of 40 mils thick; slip-resisting, polyethylene-film-reinforced top surface laminated to SBS-modified asphalt adhesive, with release-paper backing; cold applied  
  1. Products: High temperature products only.  
    a. Carlile Coating.  
    b. W.R.Grace  
    c. Henery Co.  
  2. Install a second 24 inch wide layer at the joint between asphalt shingles and standing seam metal roofing.

2.06 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. 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.

PART 3 EXECUTION

3.01 PREPARATION  
A. Where wood framing bears on cementitious foundations, install full width sill flashing continuous over top of foundation, lap ends of flashing minimum of 4 inches (100 mm) and seal.  
B. Coordinate installation of rough carpentry members specified in other sections.

3.02 INSTALLATION - GENERAL  
A. Select material sizes to minimize waste.  
B. Reuse scrap to 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.  
B. In walls, provide blocking attached to studs as backing and support for wall-mounted items, unless item can be securely fastened to two or more studs or other method of support is explicitly indicated.  
C. Provide the following specific non-structural framing and blocking:  
  1. Cabinets and shelf supports.
2. Wall brackets.
3. Handrails.
4. Grab bars.
5. Towel and bath accessories.
6. Wall-mounted door stops.
7. Wall mounted medical equipment or other as directed by owner
8. Art work as directed by owner
9. Chalkboards and marker boards.
10. Wall paneling and trim.
11. Joints of rigid wall coverings that occur between studs.

3.04 INSTALLATION OF CONSTRUCTION PANELS
   A. Wall Sheathing: Secure with long dimension perpendicular to wall studs, with ends over firm bearing and staggered, using nails, screws, or staples.

3.05 UNDERLAYMENT:
   A. Provide where indicated on drawings per manufacturers published recommendations for substrate and roofing materials indicated.

3.06 SITE APPLIED WOOD TREATMENT
   A. Apply preservative treatment compatible with factory applied treatment at site-sawn cuts, complying with manufacturer's instructions.
   B. Allow preservative to dry prior to erecting members.

3.07 TOLERANCES
   A. Framing Members: 1/4 inch (6 mm) from true position, maximum.
   B. Variation from Plane (Other than Floors): 1/4 inch in 10 feet (2 mm/m) maximum, and 1/4 inch in 30 feet (7 mm in 10 m) maximum.

3.08 CLEANING
   A. Do not leave any wood, shavings, sawdust, etc. on the ground or buried in fill.
   B. Prevent sawdust and wood shavings from entering the storm drainage system.

END OF SECTION
SECTION 06 2000
FINISH CARPENTRY

PART 1 GENERAL

1.01 SECTION INCLUDES
   A. Finish carpentry items.

1.02 RELATED REQUIREMENTS
   A. Section 06 4100 - Architectural Wood Casework: Shop fabricated custom cabinet work.

1.03 REFERENCE STANDARDS
   A. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards; 2014, with Errata (2016).
   C. NEMA LD 3 - High-Pressure Decorative Laminates; 2005.

1.04 SUBMITTALS
   A. See Section 01 3000 - Administrative Requirements for submittal procedures.
   B. Shop Drawings: Indicate materials, component profiles, fastening methods, jointing details, and accessories.
      1. Provide the information required by AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS).

1.05 DELIVERY, STORAGE, AND HANDLING
   A. Protect from moisture damage.

PART 2 PRODUCTS

2.01 FINISH CARPENTRY ITEMS
   A. Quality Standard: Custom Grade, in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), unless noted otherwise.
   B. Interior Woodwork Items:
      1. Moldings, Bases, Casings, and Miscellaneous Trim:

2.02 LUMBER MATERIALS
   A. Hardwood Lumber: Baltic Birch species, plain sawn, maximum moisture content of 6 percent; with vertical grain, of quality suitable for transparent finish.

2.03 PLASTIC LAMINATE MATERIALS
   A. Plastic Laminate: NEMA LD 3; color as selected by Architect; textured, low gloss finish.
   B. Laminate Adhesive: Type recommended by laminate manufacturer to suit application; not containing formaldehyde or other volatile organic compounds.

2.04 FASTENINGS
   A. Adhesive for Purposes Other Than Laminate Installation: Suitable for the purpose; not containing formaldehyde or other volatile organic compounds.
   B. Fasteners: Of size and type to suit application.

2.05 ACCESSORIES
   A. Wood Filler: Solvent base, tinted to match surface finish color.

2.06 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.
2.07 SHOP FINISHING
   A. Apply wood filler in exposed nail and screw indentations.
   B. Finish work in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), Section 5 - Finishing for grade specified and as follows:
      1. Transparent:
         a. System - 11, Polyurethane, Catalyzed.
         b. Sheen: Satin. Open grain

PART 3 EXECUTION
3.01 EXAMINATION
   A. Verify adequacy of backing and support framing.

3.02 INSTALLATION
   A. Install custom fabrications in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS) requirements for grade indicated.
   B. Set and secure materials and components in place, plumb and level.
   C. Carefully scribe work abutting other components, with maximum gaps of 1/32 inch (0.79 mm). Do not use additional overlay trim to conceal larger gaps.

3.03 TOLERANCES
   A. Maximum Variation from True Position: 1/16 inch (1.6 mm).
   B. Maximum Offset from True Alignment with Abutting Materials: 1/32 inch (0.79 mm).

END OF SECTION
SECTION 06 4100
ARCHITECTURAL WOOD CASEWORK

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Specially fabricated cabinet units. Exposed cabinet grade plywood cabinets as indicated on drawings.
B. Countertops.
C. Hardware.
D. Factory finishing.
E. Preparation for installing utilities.

1.02 RELATED REQUIREMENTS
A. Section 06 1000 - Rough Carpentry: Support framing, grounds, and concealed blocking.

1.03 REFERENCE STANDARDS
A. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards; 2014, with Errata (2016).
C. BHMA A156.9 - American National Standard for Cabinet Hardware; 2015.
D. NEMA LD 3 - High-Pressure Decorative Laminates; 2005.

1.04 SUBMITTALS
A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Shop Drawings: Indicate materials, component profiles, fastening methods, jointing details, and accessories.
C. Samples: Submit actual sample items of proposed pulls and hinges, 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.
   1. Accredited participant in the specified certification program prior to the commencement of fabrication and throughout the duration of the project.
B. Quality Certification:
   1. Provide labels or certificates indicating that the installed work complies with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS) requirements for grade or grades specified.
   2. Provide designated labels on shop drawings as required by certification program.
   3. Provide designated labels on installed products as required by certification program.
   4. Submit certifications upon completion of installation that verifies this work is in compliance with specified requirements.
   5. Replace, repair, or rework all work for which certification is refused.

1.06 DELIVERY, STORAGE, AND HANDLING
A. Protect units from moisture damage.

PART 2 PRODUCTS

2.01 MANUFACTURERS
A. Single Source Responsibility: Provide and install this work from single fabricator.
2.02 CABINETS
A. Quality Standard: Custom Grade, in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), unless noted otherwise.
B. Plastic Laminate Faced Cabinets: Custom grade.
C. Cabinets:
   2. Finish - Exposed Interior Surfaces: Decorative laminate where indicated on drawings.
   4. Door and Drawer Front Edge Profiles: Square edge.
   5. Casework Construction Type: Type A - Frameless.
   6. Adjustable Shelf Loading: 50 lbs. per sq. ft.
   7. Cabinet Style: Flush overlay.
   8. Drawer Side Construction: Multiple-dovetailed.
   10. Shelves to be 1” min thickness typical including uppcabinet bottoms.

2.03 LAMINATE MATERIALS
A. Manufacturers:
   2. Panolam Industries International, Inc; Pointe.
   4. Pointe.
   5. Substitutions: See Section 01 6000 - Product Requirements.
B. High Pressure Decorative Laminate (HPDL): NEMA LD 3, types as recommended for specific applications.
C. Provide specific types as indicated in drawings

2.04 COUNTERTOPS
A. Plastic Laminate Countertops: Medium density fiberboard substrate covered with HPDL, post-formed, with coved integral backsplash, and 1-1/2” 3mm edge color as selected by architect
   1. See drawings for locations, manufacturers, and colors
B. Solid Surface countertops: Basis of Design: Pental
   1. See drawings for locations
   2. Quality standard: Comply with AWS Section 11 requirements for solid surfact countertops
   3. Grade: Custom
   4. 3/4” min thickness with 1-1/2” squared edges.
   5. Color: See Finish Schedule

2.05 ACCESSORIES
A. Adhesive: Type recommended by fabricator to suit application.
B. Plastic Edge Banding: Extruded PVC, 3mm smooth finish;
   1. Color: As selected by Architect from manufacturer's standard range. Match cabinet laminate
C. Glass: Type 1/4” clear safety glass (wire glass not permitted) as specified in Section 08 8000.
D. Fasteners: Size and type to suit application.

2.06 HARDWARE
A. Hardware: BHMA A156.9, types as indicated for quality grade specified.
B. Adjustable Shelf Supports: Standard side-mounted system using 32 mm holes /support system with K&V 345 NP supports ________ inch (32 mm)

C. Drawer and Door Pulls: back mounted.
   1. Product: Barpull manufactured by Amerock.
      a. See Finish Schedule

D. Cabinet Locks: Keyed cylinder, two keys per lock, each room keyed the same, steel with satin finish.
   1. Product: 5 pin tumbler or disk type. Consult owner for keying system.

E. Catches: Touch type.

F. Drawer Slides:
   1. Type: Extension types as indicated.
   2. Static Load Capacity: Box drawers 75lbf. File Drawers 150 lbf min size appropriatly for extra wide horizontal files (if any)
   4. Stops: Integral type.

G. Hinges: European style concealed self-closing type, steel with satin finish.165 deg snap on type

H. File Drawer Inserts: provide bar type file drawer inserts to accomodate "letter" and Legal size hanging files.

2.07 FABRICATION

A. Assembly: Shop assemble cabinets for delivery to site in units easily handled and to permit passage through building openings.

B. Edging: Fit shelves, doors, and exposed edges with specified edging. Do not use more than one piece for any single length.

C. Fitting: When necessary to cut and fit on site, provide materials with ample allowance for cutting. Provide matching trim for scribing and site cutting.

D. Plastic Laminate: Apply plastic laminate finish in full uninterrupted sheets consistent with manufactured sizes. Fit corners and joints hairline; secure with concealed fasteners. Slightly bevel arises. Locate counter butt joints minimum 2 feet (600 mm) from sink cut-outs.

E. Mechanically fasten back splash to countertops as recommended by laminate manufacturer at 16 inches (400 mm) on center.

F. Provide cutouts for plumbing fixtures. Verify locations of cutouts from on-site dimensions. Prime paint cut edges.

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. Carefully scribe casework abutting other components, with maximum gaps of 1/32 inch (1 mm). Do not use additional overlay trim for this purpose. Provide cont sealant a butting adjacent surfaces. color a selected by architect.

C. Secure cabinets to floor using appropriate angles and anchorages.

D. 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. Test installed work for rigidity and ability to support loads. Adjust as required.
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
SECTION 06 6110
GLASS FIBER REINFORCED PLASTIC FABRICATIONS

PART 1  GENERAL

1.01  SECTION INCLUDES
A. Glass fiber reinforced plastic fabrications:
   1. Column Covers
   2. 8x8 Soffit Brackets

1.02  RELATED SECTIONS
A. Section 09900 - Paints and Coatings: Field painting and sealing prior to painting.

1.03  REFERENCES

1.04  SUBMITTALS
A. Submit under provisions of Section 01300.
B. Product Data: Manufacturer's data sheets on each product to be used, including dimensions, finishes, storage and handling requirements and recommendations, and installation recommendations.
C. Shop Drawings: Provide drawings showing dimensions, layout, joints, details, and interface with adjacent work; include field measured dimensions of the spaces where items are to be installed, if critical to proper installation.
D. Samples: For each custom finish specified, two samples, minimum size 6 inches (150 mm) square, representing actual product, color, and patterns.

1.05  DELIVERY, STORAGE, AND HANDLING
A. Transport, lift, and handle units with care, avoiding excessive stress and preventing damage; use appropriate equipment.
B. Store products in manufacturer's unopened packaging until ready for installation, in a clean dry area off the ground and protected from weather, moisture and damage; store units upright and not stacked unless permitted by manufacturer.

PART 2  PRODUCTS

2.01  MANUFACTURERS
A. Stromberg Architectural Products Inc; PO Box 8036, I-30 West, 4400 Oneal, Greenville, TX 75404. ASD. Tel: (903) 454-0904. Fax: (903) 454-3642. Email: sales@strombergarchitectural.com. www.strombergarchitectural.com.
B. Edon; www.edon.com
C. Substitutions: See Section 01 6000 - Product Requirements.

2.02  MATERIALS
A. Glass Fiber Reinforced Plastic Fabrications: Molded surface coat over polyester resin laminate reinforced with glass fiber and structural reinforcing as required.
   1. Surface Coat: Ultraviolet inhibited NPG-ISO polyester gel coat, 20 mils (0.5 mm) thick, nominal.
2. Surface Coat: Polyurethane.
3. Color: As specified in the Construction Documents.
5. Resin: Isophthalic polyester resin; with flame spread index less than 25, smoke developed index less than 450, when tested in accordance with ASTM E 84; heat distortion greater than 180 degrees F (82 degrees C), when tested in accordance with ASTM D 648.
7. Glass Content: 25 to 30 percent by weight.
8. Glass Content: 15 percent by weight, maximum.
9. Shell Thickness: 3/16 inch (5 mm), minimum.
10. Surface Burning Characteristics: Flame spread index of less than 25, smoke developed index of less than 450, when tested in accordance with ASTM E 84.
11. Flexural Strength: 20000 psi (138 MPa), when tested in accordance with ASTM D 790.
12. Modulus of Elasticity: 0.9 x 10^6 psi (6200 MPa), when tested in accordance with ASTM D 790.
13. Tensile Strength: 12000 psi (83 MPa), when tested in accordance with ASTM D 638.
14. Compressive Strength: 17000 psi (117 MPa), when tested in accordance with ASTM D 695.
15. Bearing Strength: 9000 psi (62 MPa), when tested in accordance with ASTM D 638.
16. Thermal Expansion Coefficient: 10 x 10^-6 per degree F (5.56 x 10^-6 per degree C).
17. Specific Gravity: 1.5.
18. Variation in Thickness From Nominal: Minus 1/16 inch (1.5 mm), plus 1/4 inch (6 mm).
19. Variation in Thickness of Gel Coat: Plus and minus 2.5 mils (0.06 mm), maximum.
20. Variation from Dimensions Indicated on Drawings: Plus and minus 1/8 inch (3 mm), maximum.
21. Variation from Square: Plus and minus 1/8 inch (3 mm), maximum.
22. Variation of Hardware From Intended Location: Plus and minus 1/4 inch (6 mm), maximum.
23. Provide concealed reinforced anchorage points for anchors of type recommended by manufacturer.
24. Mark each unit with permanent serial number coordinated with shop drawing designators.
25. Cure and clean prior to shipment; remove material that may be toxic to plant or animal life or incompatible with adjacent building materials.

PART 3  EXECUTION

3.01 EXAMINATION

A. Do not begin installation until substrates have been properly constructed; verify that substrates are plumb and true.
B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
C. Check field dimensions before beginning installation. If dimensions vary too much from design dimensions for proper installation, notify Architect and wait for instructions before beginning installation.

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. Install supplementary temporary and permanent supports as required for proper installation.

3.03 INSTALLATION

A. Install in accordance with applicable code and manufacturer's recommendations, plumb and true to line; shim where necessary.
B. Install with variation from position shown on drawings not more than 1/4 inch in 10 feet (6.25 mm in 3 m); align horizontal and vertical joints.
C. Fasten using methods that allow for thermal expansion and contraction.
D. Provide control joints at not more than 35 feet (10.5 m) on center if not indicated on drawings.
E. Provide expansion joints where moving joints in substrate occur.

3.04 PROTECTION
A. Protect installed products until completion of project.
B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION
SECTION 07 1113
BITUMINOUS DAMPPROOFING

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Bituminous dampproofing.
B. Protection boards.

1.02 RELATED REQUIREMENTS
A. Section 07 2100 - Thermal Insulation: Rigid insulation board used as protection board.

1.03 REFERENCE STANDARDS

1.04 SUBMITTALS
A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide properties of primer, bitumen, and mastics.
C. Manufacturer's Installation Instructions: Indicate special procedures and perimeter conditions requiring special attention.

1.05 QUALITY ASSURANCE
A. Installer Qualifications: Company specializing in performing the work of this section with at least three years of documented experience.

1.06 FIELD CONDITIONS
A. Maintain ambient temperatures above 40 degrees F (5 degrees C) for 24 hours before and during application until dampproofing has cured.

PART 2 PRODUCTS

2.01 MANUFACTURERS
A. Other Acceptable Bituminous Dampproofing Manufacturers:

2.02 BITUMINOUS DAMPPROOFING
A. Bituminous Dampproofing: Cold-applied, spray-grade; asphalt base, volatile petroleum solvents, and other content, suitable for application by spray, brush, roller, or squeegee; asbestos-free; suitable for application on vertical and horizontal surfaces.
   1. Composition: ASTM D4479/D4479M Type I, minimum, asbestos free.
   2. VOC Content: Not more than permitted by local, State, and federal regulations.
   3. Applied Thickness: 1/16 inch (1.5 mm), minimum, wet film.
   4. Products:
      b. KARNAK Corp. 83 Fibered: www.karnakcorp.com
      c. Substitutions: See Section 01 6000 - Product Requirements.
B. Primers, Mastics, and Related Materials: Type as recommended by dampproofing manufacturer.
2.03 BITUMEN MATERIALS
   A. Cold Asphaltic Type:
      1. Bitumen: Emulsified asphalt, ASTM D1227, with fiber reinforcement other than asbestos (Type II).

2.04 ACCESSORIES
   A. Protection Board: Kingspan Green Board PB4 or equivalent.

PART 3 EXECUTION

3.01 EXAMINATION
   A. Verify existing conditions are acceptable prior to starting this work.
   B. Verify substrate surfaces are durable, free of matter detrimental to adhesion or application of dampproofing system.
   C. Verify that items penetrating surfaces to receive dampproofing are securely installed.

3.02 PREPARATION
   A. Protect adjacent surfaces not designated to receive dampproofing.
   B. Clean and prepare surfaces to receive dampproofing in accordance with manufacturer's instructions.
   C. Do not apply dampproofing to surfaces unacceptable to manufacturer.
   D. Apply mastic to seal penetrations, small cracks, or minor honeycombs in substrate.

3.03 APPLICATION
   A. Foundation Walls: Apply two coats of asphalt dampproofing.
   B. Perform this work in accordance with manufacturer's instructions and NRCA (WM) applicable requirements.
   C. Prime surfaces in accordance with manufacturer's instructions and NRCA (WM) applicable requirements.
   D. Apply bitumen with mop.
   E. Apply bitumen in one coat, continuous and uniform, at a rate of 25 sq ft/gal (0.6 sq m/L) per coat.
   F. Apply from 2 inches (50 mm) below finish grade elevation down to top of footings.
   G. Seal items watertight with mastic, that project through dampproofing surface.
   H. Place protection board directly over dampproofing, butt joints, and adhere to tacky dampproofing.
   I. Scribe and cut boards around projections, penetrations, and interruptions.

END OF SECTION
SECTION 07 1300
SHEET WATERPROOFING

PART 1  GENERAL

1.01  SECTION INCLUDES
   A.  Sheet Waterproofing:

1.02  RELATED REQUIREMENTS
   A.  Section 03 3000 - Cast-in-Place Concrete: Concrete substrate.
   B.  Section 07 2100 - Thermal Insulation: Insulation used for protective cover.

1.03  REFERENCE STANDARDS
   D.  ASTM D1876 - Standard Test Method for Peel Resistance of Adhesives (T-Peel Test); 2008 (Reapproved 2015).
   I.  ASTM E154/E154M - Standard Test Methods for Water Vapor Retarders Used in Contact with Earth Under Concrete Slabs, on Walls, or as Ground Cover; 2008a, with Editorial Revision (2013).

1.04  SUBMITTALS
   A.  See Section 01 3000 - Administrative Requirements, for submittal procedures.
   B.  Product Data: Provide data for membrane.
   C.  Manufacturer's Installation Instructions: Indicate special procedures.
   D.  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 manufacturing products specified in this section, with not less than three years of documented experience.
   B.  Installer Qualifications: Company specializing in performing work of the type specified and with at least three years of documented experience.

1.06  FIELD CONDITIONS
   A.  Maintain ambient temperatures above 40 degrees F (5 degrees C) for 24 hours before and during application and until liquid or mastic accessories have cured.

1.07  WARRANTY
   A.  See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
B. 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 WATERPROOFING APPLICATIONS

A. Self-Adhered Modified Bituminous Sheet Membrane:
   1. Location: interior side of planter walls.
   2. Cover with protection board.

2.02 MEMBRANE MATERIALS

A. Self-Adhered Modified Bituminous Sheet Membrane:
   1. Thickness: 60 mil, 0.060 inch (1.5 mm), minimum.
   2. Tensile Strength:
      a. Membrane: 325 pounds per square inch (2.24 MPa), minimum, measured according to ASTM D412 Method A, using die C and at spindle-separation rate of 2 inches (50 mm) per minute.
      b. Elongation at Break: 300 percent, minimum, measured according to ASTM D412.
      c. Water Vapor Permeance: 0.05 perm (2.9 ng/(Pa s sq m)), maximum, measured in accordance with ASTM E96/E96M.
      d. Low Temperature Flexibility: Unaffected when tested according to ASTM D1970/D1970M at minus 20 degrees F (minus 11 C), 180 degree bend on 1 inch (25 mm) mandrel.
      e. Peel Strength: 7 pounds per inch (1226 N/m), minimum, when tested according to ASTM D903.
      f. Lap Adhesion Strength: 5 pounds per inch (875.6 N/m), minimum, when tested according to ASTM D1876.
      g. Puncture Resistance: 50 pounds (22.67 kg), minimum, measured in accordance with ASTM E154/E154M.
      h. Water Absorption: 0.1 percent increase in weight, maximum, measured in accordance with ASTM D570, 24 hour immersion.
      i. Hydrostatic Resistance: Resists the weight of 200 feet (61 m) when tested according to ASTM D5385/D5385M.
      j. Adhesives, Sealants, Tapes, and Accessories: As recommended by membrane manufacturer.
      k. Manufacturers:
   12. Manufactures:
      b. Substitutions: See Section 01 6000 - Product Requirements.

B. Seaming Materials: As recommended by membrane manufacturer.

C. Membrane Sealant: As recommended by membrane manufacturer.

D. Flexible Flashings: _____ inch (_____ mm) thick butylene.

E. Termination Bars: Aluminum; compatible with membrane and adhesives.

F. Adhesives: As recommended by membrane manufacturer.

G. Thinner and Cleaner: As recommended by adhesive manufacturer, compatible with sheet membrane.

2.03 ACCESSORIES

A. Sealant for Cracks and Joints In Substrates: Resilient elastomeric joint sealant compatible with substrates and waterproofing materials.

B. Protection Board: Rigid insulation specified in Section 07 2100.

C. Flexible Flashings: Type recommended by membrane manufacturer.
PART 3 EXECUTION

3.01 EXAMINATION
A. Verify existing conditions are acceptable prior to starting this work.
B. Verify substrate surfaces are durable; free of matter detrimental to adhesion or application of waterproofing system.
C. Verify items that penetrate surfaces to receive waterproofing are securely installed.

3.02 PREPARATION
A. Protect adjacent surfaces from damage 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. Fill non-moving joints and cracks with a filler compatible with waterproofing materials.
E. Seal moving cracks with sealant and non-rigid filler, using procedures recommended by sealant and waterproofing manufacturers.
F. Surfaces for Adhesive Bonding: Apply surface conditioner at a rate recommended by manufacturer, and protect conditioner from rain or frost until dry.
G. Concrete Surfaces for Adhesive Bonding: Prepare concrete substrate according to ASTM D5295/D5295M.
   1. Remove substances that inhibit adhesion including form release agents, curing compounds admixtures, laitance, moisture, dust, dirt, grease and oil.
   2. Repair surface defects including honeycombs, fins, tie holes, bug holes, sharp offsets, rutted cracks, ragged corners, deviations in surface plane, spalling and delaminations, as described in the reference standard.
   3. Remove and replace areas of defective concrete as specified in Section 03 3000.
   4. Prepare concrete for adhesive bonded waterproofing using mechanical or chemical methods described in the referenced standard.
   5. Test concrete surfaces as described in the referenced standards. Verify surfaces are ready to receive adhesive bonded waterproofing membrane system.

3.03 INSTALLATION - MEMBRANE
A. Install membrane waterproofing in accordance with manufacturer's instructions and NRCA (WM) applicable requirements.
B. Roll out membrane, and minimize wrinkles and bubbles.
C. Self-Adhering Membrane: Remove release paper layer, and roll out onto substrate with a mechanical roller to provide full contact bond.
D. Overlap edges and ends, minimum 3 inches (76 mm), seal permanently waterproof by method recommended by manufacturer, and apply uniform bead of sealant to joint edge.
E. Reinforce membrane with multiple thickness of membrane material over joints, whether joints are static or dynamic.
F. Weather lap joints on sloped substrate in direction of drainage, and seal joints and seams.
G. Flexible Flashings: Seal items watertight that penetrate through waterproofing membrane with flexible flashings.
H. Seal membrane and flashings to adjoining surfaces.
   1. Install termination bar along edges.

3.04 INSTALLATION - DRAINAGE PANEL AND PROTECTION BOARD
A. Place drainage panel directly against membrane, butt joints, place to encourage drainage downward. Scribe and cut boards around projections, penetrations, and interruptions.
3.05 PROTECTION
   A. Do not permit traffic over unprotected or uncovered membrane.

END OF SECTION
SECTION 07 1617
WATERPROOFING

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes: Furnish all labor, materials, services and equipment necessary to supply a cementitious capillary concrete admixture in combination with a breathable, waterproofing system by means of a spray-applied, environmentally safe solution, that penetrates into and integrates with the concrete. The system must be applicable to both above-grade or below-grade projects and can be installed on either dry or wet side substrates with integral flashing, detailing and other components.

1. Locations of Work: All below grade concrete surfaces at basement foundations and floor slabs, to be protected from water penetration and environmental damage. Apply on outside and inside surface of foundation walls.

2. Coordination: All waterproofing work shall be coordinated with all trades on the project site and shall conform to all requirements stated in this Section and include all concrete mix design, finishing and curing.

3. Sequence of Work:
   a. All remedial and detail work shall be performed prior to the application of the specified spray-applied waterproofing agent.
   b. The spray-applied waterproofing agent specified within this Section is activated with the manufacturer’s accelerating agent, crack & void treatment and multiple applications of water.
   c. Sequence of application shall conform with manufacturer’s written requirements and as outlined within this specification.

B. Related Sections:
   1. Section 030000 - Concrete Forming & Accessories
   2. Section 079000 - Joint Protection
   3. Section 099000 - Paints & Coatings

1.02 SUBMITTALS

A. General: Submit listed submittals in accordance with conditions of the Contract and with Division 1 Submittal Procedures Section.

B. Product Data: Submit Manufacturer’s Product Sell Sheets, Technical Data Sheets and Safety Data Sheets for each product to be used in the application of the spray-applied waterproofing system.
   1. Ensure that all technical or safety data sheets provide information about the VOC content of the product to be used.
   2. All product documents should state or show the environmental impact the product may or may not have.

C. Test Reports: Submit for acceptance, complete test reports from approved independent testing laboratories certifying that the spray-applied waterproofing system conforms to the performance characteristics and testing requirements specified herein.

D. Manufacturer’s Certification: Provide documentation signed by the manufacturer or manufacturer’s representative certifying that the materials to be installed comply with the requirements of this specification and the materials meet the requirements of the manufacturer’s 15-year or 30-year Limited Labor & Material warranty.

E. Manufacturer’s Warranty: Provide and submit a copy of the Manufacturer’s 15-Year or 30-Year Limited Labor & Material Warranty prior to any work beginning.

F. Contractor Qualifications:
   1. The contractor applying the products and system shall be trained and certified by the Manufacturer of the waterproofing system and be capable of installing the product per the
Manufacturer's installation instructions in such a manner that the project becomes eligible for the Manufacturer's 15-Year or 30-Year Limited Labor and Material Warranty.

2. The contractor must also supply to the architect or engineer a list of successful past jobs of the same or similar product; contact information for principal personnel; and resume of company experience, training and certifications as specified in Part 1.4 “Quality Assurance”.

1.03 QUALITY ASSURANCE

A. Manufacturer's Qualifications: Manufacturer shall be a United States based manufacturing company with no less than 30 years of successful project application of the spray-applied waterproofing agent used in the specified waterproofing system.

B. Contractor Qualifications: The application contractor must be a manufacturer's certified contractor who has been trained by the manufacturer in the proper application and installation of the waterproofing system specified and is certified to install the product for the warranty and system specified.

C. Field Mock-Up: Prior to the application of the waterproofing system, a field mock-up may be required to verify aesthetic effects of the waterproofing system and the components for repair and detailing. No less than 100 square feet may be required to show the aesthetic appearance of the products.

D. Jobsite Resources: The contractor shall visit the site and ensure that there is an adequate amount of resources to supply water to complete the installation of the system and there is proper drainage to accommodate the installation process. If there is not an adequate amount of resources to accommodate the installation of the spray-applied waterproofing system, then the contractor must provide resources to meet these requirements.

E. Pre-Installation Conference: Prior to placing concrete for areas scheduled, conduct a conference at the Project site to comply with requirements of application Division 01 Sections.
   1. Require attendance of parties directly affecting work of this section, including the TechCrete Certified Contractor, the General Contractor and the Manufacturer's Representative.
   2. Review the surface preparation, remedial work, application, cleaning, protection and coordinate with other work and trades.

1.04 SYSTEM PERFORMANCE REQUIREMENTS

A. Testing Requirements: The spray-applied waterproofing system shall have been tested in accordance with the following standards and conditions, and the testing results shall meet or exceed the performance requirements as specified herein.

B. Potable Water Approval: The spray-applied waterproofing product and associated accelerating agent shall be listed and labeled with Underwriters Laboratories approved logo and test description, denoting that the product has been tested under the Underwriters Laboratory ANSI NSF 61 standard, has passed the test and is listed as “potable water / drinking water safe”. Product containers must contain the appropriate UL label. Any product not properly labeled, as stated, shall not be used without the written approval of the manufacturer, stating the product is approved under this section.

C. Chloride Ion Resistance: The waterproofing product shall provide independent testing results showing that the waterproofing agent increases the chloride Ion Resistance of the product. Testing shall show that under ASTM C1202-17 the waterproofing agent increases the resistance to chloride ion penetration by no less than 33% over untreated concrete.

1.05 FIELD CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within the limits recommended and required by the manufacturer for optimum results. Do not install products under environmental conditions outside of the manufacturer's absolute limits.

B. Read and follow the Safety Data Sheets (SDS), container labels, and Technical Data Sheets as provided by the manufacturer for each product for health and safety information.
C. Prior to any work beginning make sure all vehicles, equipment or tools have been removed from the area or adequate protection has been provided for protection against dust and overspray. Any damage from dust, dirt, debris or overspray will be the responsibility of the contractor.

D. Safety glasses and hard hats should be worn by all personnel during the cleaning and application processes. Personnel handling the liquid products should wear protective gloves and clothing.

E. Waterproofing Coordination:
   1. The waterproofing system requires that the concrete be cured using curing blankets and proper water curing technique. No chemical curing compounds shall be used in combination with this waterproofing system. Contact the manufacturer for guidelines and requirements of the curing system.
   2. Confirm that all patching materials, sealants, coatings, etc. are either supplied by the waterproofing system manufacturer or approved for use under the terms of the manufacturer’s warranty.

F. Do not proceed with application of any surface applied materials when substrate temperature is less than 400 F (4.50 C) or above 1040 F (400 C) and if precipitation is imminent within 4 hours after application of any of these products. Under no circumstances shall the sprayed-applied waterproofing system be applied to a damp or frosted surface.

G. Take special precautions when ambient and/or substrate temperatures are approaching 1040 F (400 C). It may be necessary to limit material application to evening hours.

H. The waterproofing system and its components shall not be applied if the surface has not been properly prepared and is clean and free of dirt, debris and other contaminants. This includes repairing all cracks that may have occurred. See Part 2 – Products for list of approved products to be used for cleaning or repairing the surface of the concrete.

I. Coordinate waterproofing system application with other trades. Applicator shall have the sole right of access to the specified area for the time needed to complete the application and allow the system to cure adequately.

J. Protect adjacent surfaces from potential damage resulting from the application of the spray-applied waterproofing system. If necessary, mask and/or cover adjacent surfaces that may be damaged by the components of the spray-applied waterproofing system. It is important that glass, aluminum, wood and painted surfaces be protected from overspray of the waterproofing agent, as the overspray may damage the surface of these materials.

K. Maintain work area in a neat and orderly condition, removing empty containers, rags and trash daily from the site. Ensure that dirt and debris is not tracked across completed work areas.

1.06 WARRANTY

A. Manufacturer’s Warranty: Upon completion provide a manufacturer’s standard 15-Year or 30-Year Limited Material & Labor Warranty, executed by the authorized company official.
   1. Warranty shall commence upon successful completion of Manufacturer’s project inspection and the Date of Substantial Completion.

B. 15-Year or 30-Year Material & Labor Warranty
   1. Manufacturer warrants, inclusive of contractor’s labor, that, upon completion of the work, surfaces treated with waterproofing agent and required detail products, will remain free of water leakage resulting from defective workmanship or materials for a period of 15 years or 30 years from Date of Substantial Completion.
      a. Exception: Detail products are required to be inspected by the manufacturer’s representative at the end of each 5-year period. If upon inspection, any deterioration has occurred, in the detail products, then another application of those products will be made by the TechCrete Certified Contractor at the owner’s expense. If this inspection does not take place or if the remedial work is not performed by a TechCrete Certified Contractor, the warranty will be considered void and invalid.
   2. Detail Products:
      a. TechCrete WT Expansion Joint System
b. TechCrete PolyMembrane Flashing  
c. TechCrete PolySeal Sealant  
d. ACR Concrete Patch & Repair  
e. ACR HP Concrete Repair  
f. ACR Pourable Sealer

3. In the event, that water leakage occurs within the warranty period from such causes as defined within the warranty document, the manufacturer shall, at their own expense, repair, replace or otherwise correct such defective workmanship and materials within the terms of the Manufacturer’s Warranty. Failure to comply with the terms of the Manufacturer’s Warranty may cause the warranty to be suspended or terminated.

4. The manufacturer or the contractor shall not be liable for any consequential or incidental damages as defined within the Manufacturer’s Warranty document.

5. Manufacturer’s liability shall be limited to repair, replacement, or correction of defective workmanship and materials, as defined within the terms of the Manufacturer’s Warranty.

6. The Manufacturer’s warranty excludes leaks or other defects due to causes stated within the warranty document, including but not limited to structural failure, movement of the structure, fire, earthquakes, tornadoes, and hurricanes.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Acceptable Manufacturer:
   1. All products shall be as manufactured or supplied by Alchemco, A division of MBC North America, Inc. 8590 Sanford Drive, Henrico, VA 23228; www.alchemco.com
   2. Others as approved by the Architect.

2.02 MATERIALS

A. Proprietary Products: The following products are approved for application and warrantability or their equal, submitted as defined for Comparable Products, in Division 1.
   1. Concrete admix: TechCrete Concrete Admix
   2. Waterproofing product: TechCrete 2500 Waterproofing Agent
   3. Accelerator: TechCrete Accelerating Agent
   4. Crack & void treatment: TechCrete Crack & Void Treatment
   5. Waterstop: TechCrete Waterstop Strip
   6. Waterstop adhesive: TechCrete Waterstop Adhesive

B. Substitutions: See Section 01 6000 - Product Requirements.

C. Source Quality: Obtain all proprietary waterproofing products, accelerating agents, flashing, sealants, repair and surface preparation products from a single manufacturing source, to ensure the integrity of warrantable system.

PART 3 - EXECUTION

3.01 SUBSTRATE INSPECTION AND CONDITIONS

A. Site Visit: Prior to any Work, arrange a visit to the project site with the waterproofing manufacturer’s representative. The certified applicator and the manufacturer’s representative shall inspect and certify that the concrete surfaces are in acceptable condition to receive the waterproofing system. Do not proceed with Work until defects in the substrate have been corrected and have been made acceptable for the installation of the waterproofing system and comply with the manufacturer’s written instructions.

B. Chemical Additives: Verify that any ready-mix additives are compatible with the TechCrete Concrete Admix. Review with the manufacturer prior to the mixing or application of any concrete, if necessary.

C. Concrete Mix Design: The concrete mix design and the cement contained in the concrete must be of Type I/II Portland Cement and be free of any pozzolans such as type F Fly Ash or excessive silica fume. The concrete mix design must be reviewed and approved by the waterproofing system manufacturer prior to the start of the project.
D. **Concrete Installation:** Ensure that the concrete has been properly compacted by vibration and adequately cured for at least 28 days.

E. **Waterstop:** Install TechCrete Waterstop Strip where noted on plans and details. All TechCrete Waterstop Strip requires the use of TechCrete Waterstop adhesive for proper installation, warrantable application. At the Architect’s discretion TechCrete Waterstop Strip may be required at cold joints when pouring scheduled has caused long delays between pours.

F. **Verification of Substrates:** Verify that concrete surfaces are sound and clean, and that any form release agents, debris, jobsite contaminants, and any materials used to cure the concrete are fully removed. See 3.2 Preparation for necessary steps for corrective action.

G. **Examination for Defects:** Examine surfaces to be protected by the waterproofing system for defects such as any static cracks, structural cracks, honeycombing, rock pockets, and faulty construction joints. Such defects are to be repaired in accordance with manufacturer’s product technical data sheets and installation instructions, in accordance with Section 3.2 below and prior to the application of the waterproofing agent and accelerating agent to the general surface of the concrete.

### 3.02 SURFACE PREPARATION

A. **Surface Cleaning:** Surfaces to receive the waterproofing agent shall be cleaned of any dirt, oil, grease, or other contaminants. If upon inspection any of these contaminants are present, then the use of one of the following manufacturer’s products is required or the manufacturer’s approved substitute.

1. **Dirt & Environmental Debris:** Following the manufacturer’s technical data sheets and published instructions apply ACR Concrete & Masonry Cleaner to the surface of the concrete. Allow enough time for the product to work, apply scrubbing action, either manually or via an approved machine, then rinse with clean water. Allow surface to dry thoroughly before proceeding with application of waterproofing agent.

2. **Paint & Paint Stains:** Following the manufacturer’s technical data sheets and published instructions apply ACR Paint & Stain Remover to the surface of the concrete. Allow enough time for the product to begin breaking down the paint or paint stain. Once the paint or paint stain has begun to soften, remove with either a putty knife or stiff bristle brush, then apply ACR Concrete & Masonry Cleaner to stop or neutralize the ACR Paint & Stain Remover, then rinse with clean water. Allow surface to dry thoroughly before proceeding with application of waterproofing agent. Shot blasting of the surface to remove paint and paint stains may be substituted for ACR Paint & Stain Remover. Special steps should be taken to protect surrounding area from the effects of the shot blasting, including dust debris.

3. **Oil & Grease Removal:** Following the manufacturer’s technical data sheets and published instructions apply ACR Emulsifying Cleaner to the surface of the concrete. Allow enough time for the ACR Emulsifying Cleaner to break down the oil and grease, then rinse with clean water. Re-inspect the surface to ensure the removal of all oil and grease. If necessary, repeat the application until the surface is free of oil and grease. Allow surface to dry thoroughly before proceeding with application of the waterproofing agent.

B. **Surface Etching:** Upon inspection if it is determined that the surface of the concrete is not porous enough to accept the waterproofing agent, then an application of the ACR Concrete & Masonry Etch will be required. Following the manufacturer’s technical data sheets and published instructions apply ACR Concrete & Masonry Etch to the surface of the concrete. Allow enough time for the product to react with the concrete surface, then rinse with clean water.

1. To determine the ability of the concrete to accept the waterproofing agent, take a small amount of standard tap water and drip on to the surface, if the water absorbs into the surface of the concrete then the concrete is porous enough to accept the waterproofing agent. If there is any question as to the concrete’s porosity, an onsite review by the manufacturer’s representative will be required.

2. Shot blasting of the surface to may be substituted for ACR Concrete & Masonry Etch. Only contractors who are trained and qualified in the use of shot blasting will be allowed to perform this work.
a. Special steps shall be taken to protect surrounding area from the effects of the shot blasting, including dust and debris.
b. If shot blasting is used, it is important that all residual dust be removed from the surface with either vacuums or washing with clean water.
c. Contractor will be responsible for any damage to equipment, vehicles or surrounding structures from the use of shot blasting.

C. Flashing Preparation: All change of directions and details, including walls, columns, projections, drains, etc. are required to be treated using TechCrete PolyMembrane Flashing.
   1. Ensure that the area to be treated is clean and free of dirt and debris. Clean area using the manufacturer’s approved cleaning products prior to the application of any spray-applied waterproofing agent or repair products.
   2. Spray-apply TechCrete 2500 Waterproofing Agent to the area directly around the change of direction no less than 6” (150 mm) in each direction, both vertically and horizontally. Allow the waterproofing agent to dry to the touch then apply clean water. Water should be applied at no less than 1 gallon and no more than 2 gallons per each 100 square feet of work area OR no less than 5 minutes and no more than 10 minutes of application time with a standard garden hose with a spray nozzle. It is important to remove excess waterproofing for both proper adhesion of repair materials and the aesthetic appearance of the concrete surface.
   3. Once the area is dry to the touch, then spray-apply TechCrete Accelerating Agent. Ensure that the application of waterproofing agent and accelerating agent extends at least 6” (150 mm) in each direction, both vertically and horizontally.
   4. After both the TechCrete 2500 Waterproofing Agent and TechCrete Accelerating Agent have been applied and are dry to the touch begin application of TechCrete PolyMembrane Flashing.
      a. NOTE: If there is a separation between the vertical and horizontal surfaces of more than 1/8” (2 mm) then treat the separation in the same manner as a structural crack. See Section 3.3 Crack Preparation and Repair, Sub Section B Structural Crack Identification and Repair.
   5. Using a 4” (100 mm) foam roller, apply TechCrete PolyMembrane Flashing to the horizontal and vertical surfaces at least 4” (100 mm) in each direction. Apply flashing at no more than 1/32” (.4 mm) in wet thickness. If a second coat is required, wait 24 hours and apply another coat of the same thickness.

3.03 CRACK PREPARATION AND REPAIR

A. Static Crack Identification and Repair: Static cracks are usually small in size, less than 1/8” (4 mm) and rarely larger than 1/2” (8 mm), and do not extend all the way through the concrete. Static cracks are created due to internal stresses in the concrete as it dries and cures. Static cracks that exceed, on average, 1/8” in width (4 mm) shall be treated in the following manner.
   1. Once the crack has been identified as being greater than 1/8” (4 mm) and less than 8 MM in width, Using a concrete saw or grinder, cut a V-groove into the concrete at the crack point. The V should be cut into the concrete at approximately a 60-degree angle on either side of the crack, with the crack at the center of the V-cut. The V-cut should be a total of ½” (12 mm) wide for each 1/8” (4 mm) of crack width. Example: Static crack that is on average a 1/8” (4 mm) in width will have a maximum v-cut of ½” (25 mm) in width.
   2. Remove all loose concrete and vacuum clean. V-cut should be clean and free of any debris or dirt. If V cut has been exposed to any dirt or debris clean with appropriate product. See Section 3.2 Surface Preparation. Clean and dry surface is important to the continued application of the waterproofing materials.
   3. Spray-apply a flood coat of TechCrete 2500 Waterproofing Agent to the prepared crack at least 4” (100 mm) to either side of the crack and into the crack. Allow TechCrete 2500 Waterproofing Agent to dry to the touch and then apply clean water. Water should be applied at no less than 1 gallon and no more than 2 gallons per each 100 square feet of work area OR no less than 5 minutes and no more than 10 minutes of application time with a standard garden hose with a spray nozzle. It is important to remove excess
waterproofing for both proper adhesion of repair materials and the aesthetic appearance of the concrete surface.

4. Once the area is dry to the touch, then spray-apply a flood coat of TechCrete Crack & Void Treatment to the same area as the TechCrete 2500 Waterproofing Agent.

5. Allow surface to dry to the touch and then apply a bead of TechCrete PolySeal Sealant to the now waterproofed V cut. TechCrete PolySeal Sealant should be applied in such a manner as to be slightly higher than the surrounding concrete. Immediately after application of the TechCrete PolySeal Sealant, screed the sealant to smooth surface and make sealant flush with surrounding area.

B. Structural Crack Identification and Repair: A structural crack is caused by the movement of the structure and are typically severe in nature. Structural cracks can be any width, but usually extend all the way through the concrete slab. Identifying and repairing structural cracks is important to the protection of the structure and the steel contained within the structure.

Structural cracks shall be treated in the following manner.

1. Once the crack has been identified, using a concrete saw or grinder, make a square cut along the jagged edge of the crack at least ¾” (20 mm) on either side of the crack edge and at least ¾” (20 mm) into the surface of the concrete. This will create a square groove in the concrete no less than 1-1/2” (28 mm) wide by ¾” (20 mm) deep.

2. Remove all loose concrete and vacuum clean. Saw cut should be clean and free of any debris or dirt. If the saw cut or surrounding area has been exposed to any dirt or debris, clean with appropriate product. See Section 3.2 Surface Preparation.
   a. NOTE: If the area to be treated is a separation between a vertical concrete surface and a horizontal concrete surface with a clean concrete edge, then it is not necessary to saw cut the area. Area must still be clean and free of dirt and debris.

3. If any structural reinforcing steel is exposed or becomes exposed during the preparation of the crack, then the exposed reinforcing steel must be treated with an application of ACR Rust Converter & Inhibitor.
   a. Remove all loose rust and debris from the surface of the steel. This may require either manual wire brushing or a grinder with a steel wire brush. Loose rust and debris may cause the product to not adequately cover the entire surface.
   b. Using a roller or a standard paint brush, apply a liberal coat of ACR Rust Converter & Inhibitor to the surface of the reinforcing steel, making sure to cover all exposed areas.
   c. ACR Rust Converter & Inhibitor will begin working on contact. Product will change appearance as it works. If the color change does not occur apply additional product.
   d. Once the conversion process has stopped (3-4 minutes) the residue may be rinsed off with clean water. Once clean allow surface to dry to the touch before proceeding with any subsequent work. Once dry do not allow surface to become wet again before application of the TechCrete PolyMembrane Flashing.

4. If the structural crack has gone all the way through the slab and the underside of the slab can be accessed, then an application of either TechCrete PolyMembrane Flashing or a 4” (100 mm) tape product, that will adhere to the underside of the crack, must be used to seal the crack prior to application of waterproofing product. If a tape product is used, it may be removed upon completion of the waterproofing system.
   a. Using a 4” (100 mm) wide foam roller, apply TechCrete PolyMembrane to the underside of the concrete slab, applying the product at least 2” (50 mm) to either side of the crack. Allow TechCrete PolyMembrane Flashing to dry at least 24 hours prior to the application of the waterproofing product. There is no need to remove the TechCrete PolyMembrane Flashing material upon completion.

5. Spray-apply a flood coat of TechCrete 2500 Waterproofing Agent to the prepared crack at least 4” (100 mm) to either side of the saw cut and down into the crack. Allow TechCrete 2500 Waterproofing Agent to dry to the touch then apply clean water. Water should be applied at no less than 1 gallon and no more than 2 gallons per each 100 square feet of work area OR no less than 5 minutes and no more than 10 minutes of application time with a standard garden hose with a spray nozzle. It is important to remove excess...
waterproofing for both proper adhesion of repair materials and the aesthetic appearance of the concrete surface.

6. Once TechCrete 2500 Waterproofing Agent has dried to the touch, then spray-apply a flood coat of TechCrete Crack & Void Treatment to the same area as the TechCrete 2500 Waterproofing Agent.

7. Once the waterproofing agent and treatment has dried to touch apply TechCrete PolyMembrane Flashing to the clean-cut area using a 4” (100 mm) foam roller, apply a layer no more than 1/32” (.8 mm) thick. Make sure to cover the bottom of the cut joint and sides. Allow TechCrete PolyMembrane Flashing to dry thoroughly for 24 hours before proceeding with the remaining repair procedure.

8. If the crack is equal to or greater than ¼” (7 mm) in width, then the application of a backer rod must be made. Using ACR Backer Rod at least 2 times the width of the crack, place the ACR Backer Rod into the crack to compress the product and fill the void in the crack. The ACR Backer Rod should be placed no more than a ¼” (7mm) lower than the bottom of the saw cut.

9. Allow surface to dry and then apply ACR Pourable Sealer into the now waterproofed and coated saw cut. ACR Pourable Sealer should be applied to be equal or slightly less in height than the surrounding concrete surface. ACR Pourable Sealer will shrink slightly as it cures.

C. Cold Joint Identification and Repair: A cold joint is defined as a plane of weakness in concrete caused by an interruption or delay in the concreting operations. It occurs when the first batch of concrete has begun to set before the next batch is added, so that the two batches do not intermix. Cold joints must be identified and treated in the following manner.

1. If the cold joint has opened into a static crack, then perform the same repair to the crack as stated in Section 3.3A.
2. If the cold joint is still tight, then ensure that the area to either side of the cold joint is clean and free of debris.
3. Spray-apply TechCrete 2500 Waterproofing Agent to the cold joint area, at least 4” (100 mm) either side of the cold joint. Allow TechCrete 2500 Waterproofing Agent to dry to the touch then apply clean water. Water should be applied at no less than 1 gallon and no more than 2 gallons per each 100 square feet of work area OR no less than 5 minutes and no more than 10 minutes of application time with a standard garden hose with a spray nozzle. It is important to remove excess waterproofing for both proper adhesion of repair materials and the aesthetic appearance of the concrete surface.
4. Once TechCrete 2500 Waterproofing Agent has dried to the touch, then spray-apply a flood coat of TechCrete Crack & Void Treatment to the same area as the TechCrete 2500 Waterproofing Agent.
5. After both the TechCrete 2500 Waterproofing Agent and TechCrete Crack & Void Treatment have been spray-applied and are dry to the touch begin application of TechCrete PolyMembrane Flashing.
6. Using a 4” (100 mm) foam roller apply TechCrete PolyMembrane Flashing to the surface of the concrete extending at least 2” (50 mm) to either side of the control joint. Apply flashing at no more than 1/32” (.4 mm) in wet thickness. Allow at least 24 hours for the TechCrete PolyMembrane Flashing to dry and cure, before proceeding with the waterproofing system application.

3.04 PENETRATIONS & EXPANSION JOINTS

A. Drains and Penetrations:
1. Prior to concrete pour install TechCrete Waterstop Strips around all drains and drain-pipes per the manufacturers written instructions, technical data sheets and as shown on the architects plans and drawings.
2. Locations where waterstop strip may not be applicable, use the following procedure.
   a. After the concrete has been placed and cured, locate drains without the waterstop strips. Spray-apply TechCrete 2500 Waterproofing Agent to the drain area at least 6” (150 mm) around drain bowl. Allow TechCrete 2500 Waterproofing Agent to dry to the touch then apply clean water. Water should be applied at no less than 1 gallon and no
more than 2 gallons per each 100 square feet of work area OR no less than 5 minutes and no more than 10 minutes of application time with a standard garden hose with a spray nozzle. It is important to remove excess waterproofing for both proper adhesion of repair materials and the aesthetic appearance of the concrete surface.

b. Once the area has dried to the touch, then spray-apply a flood coat of TechCrete Crack & Void Treatment to the same area as the TechCrete 2500 Waterproofing Agent was applied.

c. After the area has dried to touch, install a bead of TechCrete PolySeal Sealant around the drain at the junction of the drain to the concrete. Screed out the sealant to ensure proper bonding to the drain and the surround area.

d. Once the TechCrete PolySeal Sealant has dried, using a 4” (100 mm) foam roller, apply TechCrete PolyMembrane Flashing around and into the drain bowl. Apply flashing at no more than 1/32” (.4 mm) in wet thickness. TechCrete PolyMembrane Flashing should extend at least 4” (100 mm) beyond the bowl of the drain on the concrete surface and at least 4” (100 mm) into the bowl of the drain.

3. Penetrations: Where holes are cored or formed to allow for penetrations to be placed after concrete is cured, use the following procedure.

a. Once concrete has been placed and cured, locate the penetrations that have been installed through the holes. Spray-apply a coat of TechCrete 2500 Waterproofing Agent to the inside of the hole and around the hole. Allow TechCrete 2500 Waterproofing Agent to dry to the touch and then apply clean water. Water should be applied at no less than 1 gallon and no more than 2 gallons per each 100 square feet of work area OR no less than 5 minutes and no more than 10 minutes of application time with a standard garden hose with a spray nozzle. It is important to remove excess waterproofing for both proper adhesion of repair materials and the aesthetic appearance of the concrete surface.

b. Once the area has dried to the touch, then apply a coat of TechCrete Crack & Void Treatment to the same area as TechCrete 2500 Waterproofing Agent was applied.

c. Measure the size of the gap between the penetration and the inside of the hole. Choose an ACR Backer Rod that is approximately twice the size of the gap and place the backer rod around the projection and into the hole at least ½” below the surface of the concrete. Placement of the backer rod may require the application of a push device to force the backer rod solidly into the void. It is important that the backer rod compresses to fit tightly into the gap.

d. After backer rod has been placed, pour ACR Pourable Sealer into the gap. Use a squeeze bottle with pointed tip to ensure proper placement of the pourable sealer. Pourable sealer is self-leveling and should be installed to be slightly lower or even with the concrete surface around it.

e. Once the ACR Pourable Sealer has cured (12-24 hours) apply TechCrete PolyMembrane Flashing using a 4” (100 mm) foam roller. Roll liquid flashing at least 4” (100 mm) onto the concrete surface and no less than 4” (100 mm) up the vertical surface of the object coming through the penetration. Apply flashing at no more than 1/32” (.4 mm) in wet thickness. Allow TechCrete PolyMembrane Flashing to dry and cure for at least 24 hours.

B. Expansion Joint: Install TechCrete WT Expansion Joint System where expansion joints have been located or where required by design. Follow the manufacturers installation instructions and technical data sheets.

1. Once concrete has been placed and cured, locate the areas where expansion joints are to be installed. Spray-apply a coat of TechCrete 2500 Waterproofing Agent to the inside of the concrete joint and along the top edge at least 6” (150 mm) onto the surface. Allow TechCrete 2500 Waterproofing Agent to dry to the touch then apply clean water. Water should be applied at no less than 1 gallon and no more than 2 gallons per each 100 square feet of work area OR no less than 5 minutes and no more than 10 minutes of application time with a standard garden hose with a spray nozzle. It is important to remove excess waterproofing for both proper adhesion of repair materials and the aesthetic appearance of the concrete surface.
2. Once the area has dried to touch, then apply a coat of TechCrete Accelerating Agent to the same area as the TechCrete 2500 Waterproofing Agent had been applied.
3. Once waterproofing agent and accelerating agent have dried, install TechCrete WT Expansion Joint System. Consult with manufacturer to ensure proper size and installation application.

C. Waterstop Sealing Strips: Where hydrostatic conditions exist and at the direction and discretion of the Architect, TechCrete Waterstop Strip may be applied at construction joints by filling grooves that are created along the joints. TechCrete Waterstop Strips shall be applied to the concrete using TechCrete Waterstop Adhesive. See plan drawings for specific locations of waterstop sealing strips.

3.05 APPLICATION

A. Concrete Admix: Add 22 ounces of TechCrete Concrete Admix for each cubic yard of concrete to be placed. TechCrete Concrete Admix may be added to the concrete mix at the manufacturing plant prior to transportation to the jobsite or it may be added to the concrete on site in the delivery truck, prior to pouring the concrete, but once added to the truck, material must be blended for no less than 10 minutes, prior to pouring.

B. Waterproofing Agent: No less than 28 days after the placement of concrete and once the surface of the concrete has been inspected and prepared for the application of the waterproofing agent, and all remedial work has been completed, application may begin.
1. Using a pump style sprayer, either manual, backpack, or barrel style, fill the sprayer with TechCrete 2500 Waterproofing Agent. Apply pressure to the sprayer and using a fan style tip, begin applying the waterproofing agent to the surface of the concrete.
   a. NOTE: If a barrel pump sprayer is being utilized for application of the spray-applied waterproofing products, contact the waterproofing manufacturer for guidance and requirements for the use of this type of spraying equipment.

2. First apply product to all cracks by spray flood coating the crack with an application that covers the crack and at least 2” to either side of the crack. Make sure all cracks and joints have been treated as stated in this specification.

3. Once all cracks have been treated then apply liberally to the entire surface area, but without puddling. Product should be applied at an average rate of one (1) gallon for every two hundred (200) square feet of concrete surface. NOTE: Coverage rate may vary depending on the density and porosity of the concrete. Apply in even strokes with a small amount of overlap to ensure proper coverage. Do not walk on surfaces that have been treated, if possible. Do not allow any equipment or vehicle traffic over treated area for at least 6 hours.

C. First Watering: Once the TechCrete 2500 Waterproofing Agent has been spray-applied to all designated concrete surfaces and is dry to the touch (no more than 6 hours) then begin the first watering. Water shall be applied at no less than 1 gallon (1 liter) and no more than 2 gallons (2 liters) per each 100 square feet (10 m2) of work area OR no less than 5 minutes and no more than 10 minutes of application time with a standard garden hose with spray attachment.
1. Prior to watering inspect the surface of the concrete for any puddling or excess waterproofing agent. If there is any excess material, then during the first watering, using either a squeegee or soft bristle broom, begin pushing the excess material towards drains to remove the excess waterproofing agent from the surface. It is important to remove excess waterproofing for the aesthetic appearance of the concrete.

D. Accelerating Agent & Crack & Void Treatment: No less than 6 hours after the TechCrete 2500 Waterproofing Agent has been spray-applied and the first watering has occurred, then begin spray-applying TechCrete Accelerating Agent and TechCrete Crack & Void Treatment to all surfaces that have been treated with TechCrete 2500 Waterproofing Agent.
1. First apply TechCrete Crack & Void Treatment to all non-structural or cold joints cracks by spray flood coating the crack. Make sure all structural or cold joint cracks have been treated as stated in this specification.
2. Once all cracks have been treated then begin spray applying the TechCrete Accelerating Agent to all the surfaces that have been previously treated with the TechCrete 2500 Waterproofing Agent.

E. Second Watering: After application of the TechCrete Accelerating Agent and the first watering. Allow the surface to dry for no less than 6 hours. Once dry begin to apply water to the entire surface again. Water shall be applied at no less than 1/2 gallon (2 liter) and no more than 1 gallon (4 liters) per each 100 square feet (10 m²) of work area OR no less than 3 minutes and no more than 6 minutes of application time with a standard garden hose with a spray attachment. During the second watering inspect the underside of the concrete, if possible, to determine if any leaking is still occurring.

1. If leakage persists, note the location of the leaks and re-apply TechCrete 2500 Waterproofing Agent to those areas identified. Let the waterproofing agent dry to the touch, approximately 30-60 minutes) and the re-apply Tec Crete Crack & Void Agent.

3.06 QUALITY CONTROL

A. Observation: Do not conceal, backfill, or apply any coatings to the waterproofing system before it has been observed and approved by the Architect/Engineer and a representative of the manufacturing company.

B. Testing: Each type of structure requires a different method of testing to ensure that the waterproofing system has been installed correctly and to manufacturer’s warrantable standards.

1. Floors & Walls: No flood test is required as there is no way to determine leakage.

C. Timing: The TechCrete 2500 Waterproofing System utilizes a modified get forming technology to stop water penetration. The product penetrates into the concrete to create a barrier to water, stopping the water from within the concrete rather than on the surface. The technology is catalytic in nature and requires between 3 – 5 days for the products to reach full water stopping capabilities.

3.07 CLEANING AND PROTECTION

A. Clean spillage and soiling from adjacent surfaces using appropriate cleaning agents and procedures. See Section 3.2.

B. Remove and dispose of all materials used to protect surrounding areas and non-application surfaces, following completion of the Work of this Section.

C. Clean site of all unused waterproofing products, residues, rinse water, wastes, and effluents in accordance with local and state environmental regulations.

D. Repair, restore, or replace to the satisfaction of the Architect and Property Owner, all materials, landscaping, and non-masonry surfaces damaged by exposure to waterproofing products.

E. Take measure to protect completed waterproofing system until the inspection by the Architect/Engineer and manufacturer’s representative.

3.08 COMPLETION

A. Work that does not conform to specified requirements shall be corrected and/or replaced as direct by the Owners Representative at Contractor’s expense.

END OF SECTION
SECTION 07 1900
WATER REPELLENTS

PART 1 GENERAL

1.01 SECTION INCLUDES
   A. Water repellents applied to exterior and interior, masonry, stone, and concrete surfaces.
   B. Pressure washing.
   C. Concrete etching.

1.02 REFERENCE STANDARDS
   A. ASTM C140/C140M - Standard Test Methods of Sampling and Testing Concrete Masonry Units and Related Units; 2017a.

1.03 SUBMITTALS
   A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
   B. Product Data: Provide product description.
   C. Manufacturer's Installation Instructions: Indicate special procedures and conditions requiring special attention; cautionary procedures required during application.
   D. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
   E. Manufacturer's Field Reports: Report whether manufacturer's "best practices" are being followed; if not, state corrective recommendations. Email report to Architect the same day as inspection occurs; mail report on manufacturer's letterhead to Architect within 2 days after inspection.
   F. Manufacturer's Qualification Statement.
   G. Installer's Qualification Statement.

1.04 QUALITY ASSURANCE
   A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years documented experience.
   B. Installer Qualifications: Company specializing in performing work of type specified and with at least three years of documented experience
   C. Owner reserves the right to provide continuous independent inspection of surface preparation and application of water repellent.

1.05 MOCK-UP
   A. Prepare a representative surface 48 inch by 48 inch (1219 m by 1219 m) in size using specified materials and preparation and application methods on surfaces identical to those to be coated; approved mock-up constitutes standard for workmanship.
   B. Mock-up may remain as part of the Work.

1.06 FIELD CONDITIONS
   A. Protect liquid materials from freezing.
   B. Do not apply water repellent when ambient temperature is lower than 50 degrees F (10 degrees C) or higher than 100 degrees F (38 degrees C).

1.07 WARRANTY
   A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
   B. Correct defective Work within a five year period after Date of Substantial Completion.
PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Acrylic Water Repellents:
   1. BASF Construction Chemicals; Acrylic Water Repellents:  
      www.buildingsystems.basf.com/#sle.
   2. PPG Paints; PERMA-CRETE:  www.ppgpaints.com/#sle.
   4. Substitutions: See Section 01 6000 - Product Requirements.

B. Silane, Siloxane, Silane-Siloxane Blend, and Siliconate Water Repellents:

C. Silane, Siloxane, Silane-Siloxane Blend, and Siliconate Water Repellents and Graffiti Control:
   2. PROSOCO, Inc; Sure Klean® Weather Seal Blok-Guard® & Graffiti Control:  
      www.prosoco.com/#sle.
   3. Substitutions: See Section 01 6000 - Product Requirements.

2.02 MATERIALS

A. Water Repellent:  Non-glossy, colorless, penetrating, water-vapor-permeable, non-yellowing 
   sealer, that dries invisibly leaving appearance of substrate unchanged.
   1. Applications:  Vertical surfaces and non-traffic horizontal surfaces.
   2. Number of Coats:  Two.
   3. Moisture Absorption When Applied to Masonry:  Five percent, maximum, when tested in 
      accordance with ASTM C140/C140M using masonry sample completely coated with water 
      repellent.
   4. Moisture Absorption When Applied to Concrete:  Five percent, maximum, when tested in 
      accordance with ASTM C642 concrete sample completely coated with water repellent.
   5. Maintains dry appearance when wetted.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify joint sealants are installed and cured.
B. Verify surfaces to be coated are dry, clean, and free of efflorescence, oil, or other matter 
   detrimental to application of water repellent.

3.02 PREPARATION

A. Prepare surfaces to be coated as recommended by water repellent manufacturer for best 
   results.
B. Do not start work until masonry mortar substrate is cured a minimum of 60 days.
C. Remove oil and foreign substances with a chemical solvent that will not affect water repellent.
D. Pressure wash surfaces to be coated.
   1. Firm Masonry (Concrete Masonry Units, Brick, and Dense Stone):  High pressure wash at 
      1,500 to 4,000 psi (10 to 30 MPa), at 6 to 12 inches (150 to 300 mm) from surface.
E. Acid etch smooth concrete surfaces to be coated, using procedures described in MPI (APSM); 
   match approved mock-up.
F. Allow surfaces to dry completely to degree recommended by water repellent manufacturer 
   before starting coating work.

3.03 APPLICATION

A. Apply water repellent in accordance with manufacturer's instructions, using procedures and 
   application methods recommended as producing the best results.
B. Apply at rate recommended by manufacturer, continuously over entire surface.
C. Apply two coats, minimum.
D. Remove water repellent from unintended surfaces immediately by a method instructed by water repellent manufacturer.

END OF SECTION
SECTION 07 2100
THERMAL INSULATION

PART 1 GENERAL
1.01 SECTION INCLUDES
A. Board insulation at perimeter foundation wall, underside of floor slabs, over roof sheathing, and under roof sheathing.
B. Sound Attenuation Batt Insulation and vapor retarder in interior wall construction U.N.O.
C. Batt insulation for filling stud walls, perimeter shim spaces and crevices in exterior wall and roof construction. See details and coordinate all required area voids with Architect.
D. Provide the following R values:
   1. Foundations: R-10
   2. Walls: R-13+7.5
   3. Roof: R-30

1.02 RELATED REQUIREMENTS
A. Section 06 1000 - Rough Carpentry: Installation requirements for board insulation over steep slope roof sheathing or roof structure.
B. Section 07 2119 - Foamed-In-Place Insulation: Plastic foam insulation other than boards.
C. Section 07 2129 - Sprayed Insulation: Sprayed-on, adhered fibrous insulation.
D. Section 07 5400 - Thermoplastic Membrane Roofing: Insulation specified as part of roofing system.

1.03 REFERENCE STANDARDS

1.04 SUBMITTALS
A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide data on product characteristics, performance criteria, and product limitations.
C. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

1.05 FIELD CONDITIONS
A. Do not install insulation adhesives when temperature or weather conditions are detrimental to successful installation.

PART 2 PRODUCTS
2.01 APPLICATIONS
A. Continuous insulation at stud walls: Extruded polystyrene (XPS) board.
B. Sound insulation in interior metal framed walls and in deck flutes above sound walls - see Wall Types.
C. Batt insulation to fill stud walls, voids at roof to wall transitions, and as noted on plans.
D. XPS Insulation at foundations.
2.02 FOAM BOARD INSULATION MATERIALS

A. Expanded Polystyrene (EPS) Board Insulation: Complies with ASTM C578.
   1. Flame Spread Index (FSI): Class A - 0 to 25, when tested in accordance with ASTM E84.
   2. Smoke Developed Index (SDI): 450 or less, when tested in accordance with ASTM E84.
   3. Board Size: 48 inch by 96 inch (1220 mm by 2440 mm).
   5. Type and Compressive Resistance: Type XI, 5 psi (35 kPa), minimum.
   6. Type and Water Absorption: Type XI, 4.0 percent by volume, maximum, by total immersion.
   7. Manufacturers:
      a. AFM Corp: www.r-control.com/#sle.
      c. InsulFoam LLC; InsulFoam Below Grade Insulation : www.insulfoam.com/#sle.
      d. Substitutions: See Section 01 6000 - Product Requirements.

B. Extruded Polystyrene (XPS) Board Insulation: Complies with ASTM C578 with either natural skin or cut cell surfaces.
   1. Type and Compressive Resistance: Type IV, 25 psi (173 kPa), minimum.
   2. Flame Spread Index (FSI): Class A - 0 to 25, when tested in accordance with ASTM E84.
   3. Smoke Developed Index (SDI): 450 or less, when tested in accordance with ASTM E84.
   4. Type and Thermal Resistance, R-value (RSI-value): Type IV, 5.0 (0.88) per 1 inch (25.4 mm) thickness at 75 degrees F (24 degrees C) mean temperature.
   5. Complies with fire resistance requirements indicated on drawings as part of an exterior non-load-bearing exterior wall assembly when tested in accordance with NFPA 285.
   6. Type and Water Absorption: Type IV, 0.3 percent by volume, maximum, by total immersion.
   7. Manufacturers:
      b. Kingspan Insulation LLC; GreenGuard XPS Type IV, 25 psi: www.kingspan.com/#sle.
      c. Owens Corning Corporation; FOAMULAR Extruded Polystyrene (XPS) Insulation: www.ocbuildingspec.com/#sle.
      d. Substitutions: See Section 01 6000 - 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. Sound Attenuation Batt Insulation: Flexible preformed batt or blanket, complying with ASTM C665; friction fit.
   1. Flame Spread Index: 75 or less, when tested in accordance with ASTM E84.
   2. Smoke Developed Index: 10, when tested in accordance with ASTM E84.
   3. Combustibility: Non-combustible, when tested in accordance with ASTM E136.
   5. Thickness: 3 inch (76.2 mm).
   6. Sound Transmission Class: STC 49
   7. Manufacturers:
      d. Substitutions: See Section 01 6000 - Product Requirements.

2.04 ACCESSORIES

A. Acoustic Caulk and Outlet Putty Packs: In accordance to Section 09 2116 Gypsum Board Assemblies.

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 honeycomb, fins, irregularities, or materials or substances that may impede adhesive bond.

3.02 BOARD INSTALLATION AT FOUNDATION PERIMETER
   A. Install boards horizontally on foundation perimeter.
      1. Place boards to maximize adhesive contact.
      2. Install in running bond pattern.
      3. Butt edges and ends tightly to adjacent boards and to protrusions.
   B. Extend boards over expansion joints, unbonded to foundation on one side of joint.
   C. Cut and fit insulation tightly to protrusions or interruptions to the insulation plane.
   D. Immediately following application of board insulation, place protective boards over exposed insulation surfaces.

3.03 FIELD QUALITY CONTROL
   A. See Section 01 4000 - Quality Requirements, for additional requirements.

3.04 PROTECTION
   A. Do not permit installed insulation to be damaged prior to its concealment.

END OF SECTION
PART 1 - GENERAL

1.01  1.01  SECTION INCLUDES
A. Sprayed cellulose acoustical insulation at exposed ceilings in the Music Room.

1.02  RELATED ITEMS
A. Clips, hangers, supports, sleeves and other attachments to spray bases are to be placed by other trades prior to the application of sprayed insulation.
B. Ducts, piping, conduit or other suspended equipment shall not be positioned until after the application of sprayed insulation.
C. Roof penetrations to be installed prior to application.

1.03  1.03  QUALITY ASSURANCE
A. Manufacturer must have a current Underwriters Laboratories (UL) Code Evaluation Report.
B. Manufacturer must be in compliance with the 2009 and 2012 International Building Code.
C. Manufacturer must be ISO 9001:2015 Certified.
D. Applicator: Licensed by manufacturer.
E. Manufacturer must subscribe to independent laboratory follow-up inspection services of Underwriters Laboratories and Factory Mutual. Each bag shall be labeled accordingly.
F. Mock-up: Apply a 100 square foot representative sample to be reviewed by the Architect and/or Owner prior to proceeding.

1.04  1.04  SUBMITTALS
A. Submit product data that the product meets or exceeds the following specified requirements.
   1. Bond strength shall be greater than 100 psf per ASTM E 736.
   2. Product shall be Class 1 Class A per ASTM E 84/ UL 723.
   3. Non-corrosive per ASTM C 739.
   4. Bond Deflection per ASTM E 759: 6” Deflection in 10’ Span - No Spalling or Delamination.
   5. R-Value to be 3.75 per inch per ASTM C 518.
   6. Comply with 2009 IBC Section 803.10 stability requirements for interior finishes.
   7. Meet ASTM C 1149
      a. Manufacturer's written certification that product contains no asbestos, fiberglass or other man-made mineral fibers.
      c. Minimum Fiber Recycled Content to be 75%.
      d. Cannot contain any added Urea-Formaldehyde Resins.

1.05  DELIVERY, STORAGE AND HANDLING
A. Deliver in original, unopened containers bearing name of manufacturer, product identification and reference to U.L. testing.
B. Store materials dry, off ground, and under cover.
C. Protect liquid adhesive from freezing.
D. Water to be potable.

PART 2 - PRODUCTS

2.01  ACCEPTABLE MANUFACTURERS
A. International Cellulose Corporation
B. 12315 Robin Boulevard
C. Houston, Texas 77045
D. (713) 433-6701 or (800) 444-1252
2.02 MATERIALS
      1. Color: Black
      2. Comply with local Building Code requirements.
      3. Material to have been tested in accordance with ASTM E 1042. Testing laboratory must be NVLAP accredited.

PART 3 - EXECUTION
3.01 EXAMINATION
   A. Examine surfaces and report unsatisfactory conditions in writing. Do not proceed until unsatisfactory conditions are corrected.
   B. Verify surfaces to receive spray insulation to determine if priming/sealing is required to insure bonding and/or to prevent discoloration caused by migratory stains.

3.02 PREPARATION
   A. Provide masking, drop cloths or other satisfactory coverings for materials/surfaces that are not to receive insulation to protect from over-spray.
   B. Coordinate installation of the sprayed cellulose fiber with work of other trades.
   C. Prime surfaces as required by manufacturer’s instructions or as determined by examination.

3.03 INSTALLATION
   A. Install spray applied insulation according to manufacturer’s recommendations.
   B. Install insulation to a depth of 1.5".
   C. Install insulation on floor/roof deck only. No overspray on structure members or ducting.
   D. Cure insulation with continuous natural or mechanical ventilation.
   E. Remove and dispose of over-spray.

3.04 PROTECTION
   A. Protect finished installation under provision of Division 1.

END OF SECTION
SECTION 07 2500
WEATHER BARRIERS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Vapor Retarders: Materials to make exterior walls, joints between exterior walls and roof, and joints around frames of openings in exterior walls water vapor resistant and air tight. See drawings for locations.

B. Air Barriers: Materials that form a system to stop passage of air through exterior walls, joints between exterior walls and roof, and joints around frames of openings in exterior walls.

1.02 RELATED REQUIREMENTS

A. Section 03 3000 - Cast-in-Place Concrete: Vapor retarder under concrete slabs on grade.

B. Section 07 2100 - Thermal Insulation: Vapor retarder installed in conjunction with batt insulation.

C. Section 07 5400 - Thermoplastic Membrane Roofing: Vapor retarder installed as part of roofing system.

D. Section 07 9200 - Joint Sealants: Sealing building expansion joints.

E. Section 09 2116 - Gypsum Board Assemblies: Water-resistive barrier under exterior cladding.

1.03 DEFINITIONS

A. Weather Barrier: Assemblies that form either water-resistive barriers, air barriers, or vapor retarders.

B. Vapor Retarder: Air tight barrier made of material that is relatively water vapor impermeable, to the degree specified, with sealed seams and with sealed joints to adjacent surfaces.

1. Water Vapor Permeance: For purposes of conversion, $57.2 \text{ ng/(Pa s sq m)} = 1 \text{ perm}$.

C. Water-Resistive Barrier: Water-shedding barrier made of material that is moisture resistant, to the degree specified, intended to be installed to shed water without sealed seams.

1.04 REFERENCE STANDARDS


1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data on material characteristics.

C. Shop Drawings: Provide drawings of special joint conditions.

D. Manufacturer's Installation Instructions: Indicate preparation.

1.06 QUALITY ASSURANCE

1.07 FIELD CONDITIONS

A. Maintain temperature and humidity recommended by the materials manufacturers before, during and after installation.
PART 2 PRODUCTS

2.01 WEATHER BARRIER ASSEMBLIES
A. Exterior Vapor Retarder:
   1. On outside surface of sheathing use vapor retarder coating.

2.02 VAPOR RETARDER MATERIALS (AIR BARRIER AND WATER-RESISTIVE)
A. Vapor Retarder Coating: Liquid applied, resilient, UV-resistant coating and associated joint treatment.
   1. Dry Film Thickness (DFT): 40 mils, 0.040 inch (1.016 mm), minimum.
   2. Water Vapor Permeance: 1.0 perm (57 ng/(Pa s sq m)), maximum, when tested in accordance with ASTM E96/E96M.
   3. VOC Content: Less than 50 g per L when tested in accordance with 40 CFR 59, Subpart D (EPA Method 24).
   4. Suitable for use on concrete, masonry, plywood and gypsum sheathing.
   5. Manufacturers:
      a. BASF Corporation; MasterSeal AWB 660 I: www.master-builders-solutions.basf.us/#sle.
      b. Carlisle Coatings and Waterproofing, Inc; Barriseal-R: www.carlisleccw.com/#sle.
      d. PROSOCO, Inc; R-GUARD VB: www.prosoco.com/r-guard/#sle.
      e. Sto Corp; Sto VaporSeal (40 mil application): www.stocorp.com/#sle.
      f. Substitutions: See Section 01 6000 - Product Requirements.
   6. Joint Filler: As recommended by coating manufacturer and suitable to the substrate.

2.03 ACCESSORIES

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 adhesives in accordance with manufacturer’s instructions.

3.03 INSTALLATION
A. Install materials in accordance with manufacturer’s instructions.
B. Vapor Retarders: Install continuous air tight barrier over surfaces indicated, with sealed seams and with sealed joints to adjacent surfaces.
C. Coatings:
   1. Prepare substrate in manner recommended by coating manufacturer; treat joints in substrate and between dissimilar materials as recommended by manufacturer.
   2. Use flashing to seal to adjacent construction and to bridge joints.
D. Openings and Penetrations in Exterior Weather Barriers:
   1. Install flashing over sills, covering entire sill frame member, extending at least 5 inches (125 mm) onto weather barrier and at least 6 inches (150 mm) up jambs; mechanically fasten stretched edges.
   2. At openings to be filled with frames having nailing flanges, seal head and jamb flanges using a continuous bead of sealant compressed by flange and cover flanges with sealing tape at least 4 inches (100 mm) wide; do not seal sill flange.
   3. At openings to be filled with non-flanged frames, seal weather barrier to each side of opening framing, using flashing at least 9 inches (230 mm) wide, covering entire depth of framing.
4. At head of openings, install flashing under weather barrier extending at least 2 inches (50 mm) beyond face of jambs; seal weather barrier to flashing.
5. At interior face of openings, seal gap between window/door frame and rough framing, using joint sealant over backer rod.
6. Service and Other Penetrations: Form flashing around penetrating item and seal to weather barrier surface.

3.04 FIELD QUALITY CONTROL
   A. See Section 01 4000 - Quality Requirements, for additional requirements.
   B. Coordination of ABAA Tests and Inspections:
      1. Provide testing and inspection required by ABAA QAP.
      2. Notify ABAA in writing of schedule for air barrier work, and allow adequate time for testing and inspection.
      3. Cooperate with ABAA testing agency.
      4. Allow access to air barrier work areas and staging.
      5. Do not cover air barrier work until tested, inspected, and accepted.
   C. Do not cover installed weather barriers until required inspections have been completed.
   D. Take digital photographs of each portion of the installation prior to covering up.

3.05 PROTECTION
   A. Do not leave materials exposed to weather longer than recommended by manufacturer.

END OF SECTION
SECTION 07 3113
ASPHALT SHINGLES

PART 1  GENERAL

1.01  SECTION INCLUDES
A. Asphalt shingle roofing.
B. Flexible sheet membranes for eave protection, underlayment, valley protection, and ice and water shield.
C. Associated metal flashings and accessories.

1.02  REFERENCE STANDARDS
G. NRCA (RM) - The NRCA Roofing Manual; 2018.
H. UL (DIR) - Online Certifications Directory; Current Edition.

1.03  SUBMITTALS
A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide data indicating material characteristics.
C. Shop Drawings: For metal flashings, indicate specially configured metal flashings.
D. Samples: Submit two samples of each shingle color indicating color range and finish texture/pattern; for color selection.
E. Warranty Documentation: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

1.04  QUALITY ASSURANCE
A. Products are Required to Comply with Fire Resistance Criteria: UL (DIR) listed and labeled.

1.05  FIELD CONDITIONS
A. Do not install shingles or eave protection membrane when surface temperatures are below 45 degrees F (7 degrees C).

1.06  WARRANTY
A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
B. Correct defective Work within a five year period after Date of Substantial Completion.
C. Provide lifetime manufacturer's warranty for coverage against black streaks caused by algae.
D. Provide five year manufacturer's warranty for wind damage.

PART 2  PRODUCTS

2.01  MANUFACTURERS
A. Asphalt Shingles:
   3. IKO Industries Inc; Armourshake: www.iko.com/#sle.
5. Substitutions: See Section 01 6000 - Product Requirements.

B. Algae Resistant Asphalt Shingles:
1. __________.
2. Substitutions: See Section 01 6000 - Product Requirements.

2.02 ASPHALT SHINGLES
A. Asphalt Shingles: 3-tab, asphalt-coated glass felt, mineral granule surfaced, complying with ASTM D3462/D3462M.
2. Wind Resistance (Uplift): Class G, when tested in accordance with ASTM D7158/D7158M.
3. Warranted Wind Speed: Not greater than 150 mph (241 km/h).
4. Algae Resistant.
5. Self-sealing type.
7. Color: As selected by Architect.

2.03 SHEET MATERIALS
1. Top Sheet: Woven polypropylene top surface.
2. Sheet Thickness: 40 mil (1 mm), minimum.
5. Water Vapor Permeance: 0.05 perm (0.30 ng/(Pa s sq m)), maximum, when tested in accordance with ASTM E96/E96M, Procedure A (desiccant method).
6. Functional Temperature Range: Minus 45 degrees F (42.8 C) to 250 degrees F (121 C).
7. Ultraviolet (UV) Resistance and Weatherability: Approved in writing by manufacturer for exposure to weather for minimum of six months.

2.04 ACCESSORIES
A. Roofing Nails: Standard round wire shingle type, galvanized steel, stainless steel, aluminum roofing nails, or copper roofing nails, minimum 3/8 inch (9.5 mm) head diameter, 12 gage, 0.109 inch (2.77 mm) nail shank diameter, 1-1/2 inch (38 mm) long and complying with ASTM F1667.
B. Plastic Ridge Vents: Extruded plastic with vent openings that do not permit direct water or weather entry; flanged to receive shingles.

2.05 METAL FLASHINGS
A. Metal Flashings: Provide sheet metal eave edge, gable edge, ridge, ridge vents, open valley flashing, chimney flashing, dormer flashing, and other flashing indicated.
1. Form flashings to profiles indicated on drawings.
2. Form sections square and accurate to profile, in maximum possible lengths, free from distortion or defects detrimental to appearance or performance.
3. Hem exposed edges of flashings minimum 1/4 inch (6 mm) on underside.
B. Steel Sheet Metal: Prefinished and galvanized steel sheet, 26 gage, 0.0179 inch (0.45 mm) minimum thickness, G90/Z275 hot-dipped galvanized; PVC coated, color as selected.
C. Bituminous Paint: Acid and alkali resistant type; black color.

PART 3 EXECUTION
3.01 EXAMINATION
A. Verify existing conditions prior to beginning work.
B. Verify that roof deck is of sufficient thickness to accept fasteners.
C. Verify that roof penetrations and plumbing stacks are in place and flashed to deck surface.
D. Verify roof openings are correctly framed.
E. Verify deck surfaces are dry, free of ridges, warps, or voids.

3.02 PREPARATION
   A. Seal roof deck joints wider than 1/16 inch (1.5 mm) as recommended by shingle manufacturer.
   B. At areas where eave protection membrane is to be adhered to substrate, fill knot holes and surface cracks with latex filler.
   C. Broom clean deck surfaces before installing underlayment or eave protection.

3.03 INSTALLATION - EAVE PROTECTION MEMBRANE
   A. Install eave protection membrane from eave edge to minimum 4 ft (1200 mm) up-slope beyond interior face of exterior wall.
   B. Install eave protection membrane in accordance with manufacturer's instructions and NRCA (RM) applicable requirements.

3.04 INSTALLATION - UNDERLAMENT
   A. Underlayment At Roof Slopes Up to 4:12: Install two layers of underlayment over area not protected by eave protection, with ends and edges weather lapped minimum 4 inches (100 mm), stagger end laps of each consecutive layer, and nail in place.
   B. Underlayment At Roof Slopes Greater Than 4:12: Install underlayment perpendicular to slope of roof, with ends and edges weather lapped minimum 4 inches (100 mm), stagger end laps of each consecutive layer, nail in place, and weather lap minimum 4 inches (100 mm) over eave protection.
   C. Weather lap and seal watertight with plastic cement any items projecting through or mounted on roof.

3.05 INSTALLATION - VALLEY PROTECTION
   A. Install flexible flashing in accordance with manufacturer's instructions and NRCA (RM) applicable requirements.
   B. Weather lap joints minimum 2 inches (50 mm).
   C. Nail in place minimum 18 inches (450 mm) on center, 1 inch (25 mm) from edges.
   D. At Exposed Valleys: Install one layer of sheet metal flashing, minimum 24 inches (600 mm) wide, centered over open valley and crimped to guide water flow, weather lap joints minimum 2 inch (50 mm) wide band of lap cement along each edge of first layer, press roll roofing into cement, nail in place minimum 18 inches (450 mm) on center and 1 inch (25 mm) from edges.

3.06 INSTALLATION - METAL FLASHING AND ACCESSORIES
   A. Weather lap joints minimum 2 inches (50 mm) and seal weather tight with plastic cement.
   B. Secure in place with nails at 18 inches (450 mm) on center, and conceal fastenings.
   C. Items Projecting Through or Mounted on Roofing: Flash and seal weather tight with plastic cement.

3.07 INSTALLATION - SHINGLES
   A. Install shingles in accordance with manufacturer's instructions manufacturer's instructions and NRCA (RM) applicable requirements.
      1. Fasten individual shingles using two nails per shingle, or as required by manufacturer and local building code, whichever is greater.
      2. Fasten strip shingles using four nails per strip, or as required by manufacturer and local building code, whichever is greater.
   B. Place shingles in straight coursing pattern with 5 inch (125 mm) weather exposure to produce double thickness over full roof area, and provide double course of shingles at eaves.
   C. Project first course of shingles 3/4 inch (19 mm) beyond fascia boards.
D. Extend shingles 1/2 inch (13 mm) beyond face of gable edge fascia boards.
E. Complete installation to provide weather tight service.

3.08 PROTECTION
A. Do not permit traffic over finished roof surface.

END OF SECTION
SECTION 07 4113
METAL ROOF PANELS

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Architectural roofing system of preformed steel panels.
B. Thermal roof insulation.
C. Attachment system.
D. Finishes.
E. Accessories.

1.02 RELATED REQUIREMENTS
A. Section 07 9200 - Joint Sealants: Sealing joints between metal roof panel system and adjacent construction.

1.03 REFERENCE STANDARDS

1.04 SUBMITTALS
A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Product Data: Manufacturer's data sheets on each product to be used, including:
   1. 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. Selection Samples: For each roofing system specified, submit color chips representing manufacturer's full range of available colors and patterns.
E. Verification Samples: For each roofing system specified, submit samples of minimum size 12 inches (305 mm) square, representing actual roofing metal, thickness, profile, color, and texture.
F. 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 products specified in this section, with not less than three years of documented experience.
B. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years of documented experience.

1.06 DELIVERY, STORAGE, AND HANDLING
A. Store roofing panels on project site as recommended by manufacturer to minimize damage to panels prior to installation.

1.07 WARRANTY
A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
B. 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 five years from Date of Substantial Completion.

C. Waterproofing Warranty: Provide manufacturer's warranty for weathertightness of roofing system, including agreement to repair or replace roofing that fails to keep out water within specified warranty period of five years from Date of Substantial Completion.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Basis of Design: Pac-Clad, Tite-Loc, Musket Gray.

B. Other Acceptable Manufacturers: Metal Roof Panels:
   2. Substitutions: See Section 01 6000 - Product Requirements.

2.02 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. Aluminum-zinc alloy-coated steel complying with ASTM A792/A792M; minimum AZ50 (AZM150) coating.
      b. Steel Thickness: Minimum 24 gage (0.024 inch) (0.61 mm).
   2. Profile: Standing seam, with minimum 2.0 inch (51 mm) seam height; concealed fastener system for field seaming with special tool.
   3. Texture: Striated.
   4. Length: Maximum possible length to minimize lapped joints. Where lapped joints are unavoidable, space laps so that each sheet spans over three or more supports.
   5. Width: Maximum panel coverage of 16 inches (406 mm).

2.03 ATTACHMENT SYSTEM

A. Concealed System: Provide manufacturer's standard stainless steel or nylon-coated aluminum concealed anchor clips designed for specific roofing system and engineered to meet performance requirements, including anticipated thermal movement.

2.04 FINISHES

A. Fluoropolymer Coil Coating System: Manufacturer's standard multi-coat aluminum coil coating system complying with AAMA 2605, including at least 70 percent polyvinylidene fluoride (PVDF) resin, and at least 80 percent of coil coated aluminum surfaces having minimum total dry film thickness (DFT) of 0.9 mil, 0.0009 inch (0.023 mm); color and gloss to match sample.

2.05 ACCESSORIES

A. Miscellaneous Sheet Metal Items: Provide flashings, gutters, downspouts, trim, moldings, closure strips, preformed crickets, caps, and equipment curbs 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.
   1. Downspouts: Open face, rectangular profile.

B. Rib and Ridge Closures: Provide prefabricated, close-fitting components of steel with corrosion resistant finish or combination steel and closed-cell foam.

C. Sealants:
   1. Exposed Sealant: Elastomeric; silicone, polyurethane, or silyl-terminated polyether/polyurethane.
   2. Concealed Sealant: Non-curing butyl sealant or tape sealant.
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. 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.
B. Separate dissimilar metals by applying a bituminous coating, self-adhering rubberized asphalt sheet, or other permanent method approved by roof panel manufacturer.
C. 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. Roof Panels: Install panels in strict accordance with manufacturer's instructions, minimizing transverse joints except at junction with penetrations.
   1. Form weathertight standing seams incorporating concealed clips, using an automatic mechanical seaming device approved by the panel manufacturer.
   2. Provide sealant tape or other approved joint sealer at lapped panel joints.
   3. 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
SECTION 07 5419
THERMOPLASTIC SINGLE-PLY ROOFING

PART 1 GENERAL

1.01 SUMMARY
A. This Section includes the following:
   1. Install a self-adhesive air barrier direct to roof and flashing substrates if the membrane
doesn’t provide an air barrier
   2. Install poly-isocyanurate roof insulation to total R-30.
   4. Pipe / conduit supports above the roof membrane.
   5. Provide a 30 yr 120 mph system, no dollar limit (NDL) performance warranty.

1.02 DEFINITIONS
A. Roofing Terminology: Refer to ASTM D 1079 and glossary of NRCA's "The NRCA Roofing and
   Waterproofing Manual" for definition of terms related to roofing work in this Section.
B. Design Uplift Pressure: The uplift pressure, calculated according to procedures in SPRI's "Wind
   Load Design Guide for Mechanically Fastened Roofing Systems," before multiplication by a
   safety factor.

1.03 PERFORMANCE REQUIREMENTS
A. General: Provide installed roofing membrane and base flashings that remain watertight; do not
   permit the passage of water; and resist specified uplift pressures, thermally induced movement,
   and exposure to weather without failure.
B. Material:
   1. Roofing Manufacturer must own and operate facility and equipment producing roof
      membrane for a period of Five years. Private labeled arrangements are not acceptable.
   2. Membrane shall be guaranteed in total specified thickness. ASTM manufacturing 10%
tolerances for membrane thickness are not acceptable.
   3. Membrane reinforcement shall be balanced in the center of the total membrane
      thickness. Polymer over reinforcement shall be a minimum of .040 mils.
C. Material Compatibility: Provide roofing materials that are compatible with one another under
   conditions of service and application required, as demonstrated by roofing membrane
   manufacturer based on testing and field experience.
D. Warranty Exclusions: Manufacturer's warranty shall have "No Dollar Limit" for the replacement
   of defective materials and/or labor and shall not contain any exclusion for ponding water during
   the 30 year warranty period.
E. FMG Listing: Provide roofing membrane, base flashings, and component materials that comply
   with requirements in FMG 4450 and FMG 4470 as part of a membrane roofing system and that
   are listed in FMG's "Approval Guide" for Class 1 or noncombustible construction, as applicable.
   Identify materials with FMG markings.
   1. Fire/Windstorm Classification: Class 1A-120
   2. Hail Resistance: MH

1.04 SUBMITTALS
A. Product Data: For each type of product indicated.
B. Shop Drawings: For roofing system. Include plans, elevations, sections, details, and
   attachments to other Work.
   1. Base flashings and membrane terminations.
   2. Hardboard and membrane fastening patterns.
C. Samples for Verification: For the following products:
   1. Sample of sheet roofing, color specified.
   2. Sample of walkway pads or rolls.
3. Sample length of metal termination bars.
4. Six insulation plates and fasteners of each type and finish.
5. Six roof cover fasteners of each type, and finish.

D. Installer Certificates: Signed by roofing system manufacturer certifying that Installer is accepted, authorized, or licensed by manufacturer to install roofing system.

E. Manufacturer Certificates: Signed by roofing manufacturer certifying that roofing system complies with requirements specified in "Performance Requirements" Article.
   1. Submit evidence of meeting performance requirements.

F. Qualification Data: For Installer and manufacturer.

G. Product Test Reports: Based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified testing agency, for components of roofing system.

H. Research/Evaluation Reports: For components of membrane roofing system.

I. Maintenance Data: For roofing system to include in maintenance manuals.

J. Warranties: Special warranties specified in this Section.

K. Inspection Report: Copy of roofing system manufacturer's inspection report of completed roofing installation.

1.05 QUALITY ASSURANCE

A. Installer Qualifications: A qualified firm that is accepted, authorized, or licensed by roofing system manufacturer to install manufacturer's product and that is eligible to receive manufacturer's warranty.

B. Manufacturer Qualifications: A qualified manufacturer that has UL Class A and FM 1-120 approvals for membrane roofing system identical to that used for this Project.

C. Testing Agency Qualifications: An independent testing agency with the experience and capability to conduct the testing indicated, as documented according to ASTM E 548.

D. Source Limitations: Obtain components for membrane roofing system from roofing membrane manufacturer.

E. Fire-Test-Response Characteristics: Provide membrane roofing materials with the fire-test-response characteristics indicated as determined by testing identical products per test method below by UL, FMG, or another testing and inspecting agency acceptable to authorities having jurisdiction. Materials shall be identified with applicable markings of applicable testing and inspecting agency.
   1. Exterior Fire-Test Exposure: Class A; ASTM E 108, for application and roof slopes indicated.
   2. Fire-Resistance Ratings: ASTM E 119, for fire-resistance-rated roof assemblies of which roofing system is a part.

F. Preliminary Roofing Conference: Before starting construction, conduct conference at Project site. Comply with requirements for preinstallation conferences in Division 1 Section "Quality Control." Review methods and procedures related to roof preparation and roofing system including, but not limited to, the following:
   1. Meet with Owners Representative, insurer (if applicable), testing and inspecting agency representative, roofing Installer, roofing system manufacturer's representative, and installers whose work interfaces with or affects roofing including installers of roof accessories and roof-mounted equipment.
   2. Review methods and procedures related to roofing installation, including manufacturer's written instructions.
   3. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
   4. Examine deck conditions and finishes for compliance with requirements, including flatness and fastening.
   5. Review structural loading limitations of roof deck during and after roofing.
6. Review base flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that will affect roofing system.
7. Review governing regulations and requirements for insurance and certificates if applicable.
8. Review temporary protection requirements for roofing system during and after installation.
9. Review roof observation and repair procedures after roofing installation.
10. Review protection of roof drains and piping at built up roof installation with gravel ballast.

G. Preinstallation Conference: Conduct conference at Project site. Review methods and procedures related to roofing system including, but not limited to, the following:
1. Meet with Owner, insurer (if applicable), testing and inspecting agency representative, roofing Installer, roofing system manufacturer’s representative, and installers whose work interfaces with or affects roofing including installers of roof accessories and roof-mounted equipment.
2. Review methods and procedures related to roofing installation, including manufacturer's written instructions.
3. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
4. Examine deck conditions and finishes for compliance with requirements, including flatness and fastening.
5. Review structural loading limitations of roof deck during and after roofing.
6. Review base flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that will affect roofing system.
7. Review governing regulations and requirements for insurance and certificates if applicable.
8. Review temporary protection requirements for roofing system during and after installation.
9. Review roof observation and repair procedures after roofing installation.

1.06 DELIVERY, STORAGE, AND HANDLING
A. Deliver roofing materials to Project site in original containers with seals unbroken and labeled with manufacturer’s name, product brand name and type, date of manufacture, and directions for storing and mixing with other components.
B. Store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by roofing system manufacturer. Protect stored liquid material from direct sunlight.
1. Discard and legally dispose of liquid material that cannot be applied within its stated shelf life.
C. Protect roof materials from physical damage and from deterioration by sunlight, moisture, soiling, and other sources. Store in a dry location. Comply with manufacturer's written instructions for handling, storing, and protecting during installation.
D. Handle and store roofing materials and place equipment in a manner to avoid permanent deflection of deck.

1.07 PROJECT CONDITIONS
A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit roofing system to be installed according to manufacturer's written instructions and warranty requirements.

1.08 WARRANTY:
A. Roofing Manufacturers Warranty:
1. Sika Sarnafil’s 30 year System warranty without monetary limitation, in which the manufacturer agrees to repair or replace roofing components and total roof system.
2. Warranty shall provide coverage for wind speeds up to and including 120 miles per hour.
B. Installer’s Warranty: Submit roofing Installer's warranty, including verbage outlined at end of this Section, provided and signed by Installer, covering Work of this Section, including all components of membrane roofing system such as roofing membrane, base flashing, fasteners, cover boards, and walkway products, for the following warranty period:
1. Warranty Period: 5 years.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. In other Part 2 articles where titles below introduce lists, the following requirements apply for product selection:
1. Products: Subject to compliance with requirements, provide one of the products specified.
2. Manufacturers: Subject to compliance with requirements, provide products by the manufacturers specified

B. Base Bid: The following roofing membrane shall be bid as Base Bid. Sarnafil Inc is basis of design
1. PVC Sheet: ASTM D 4434, Type III, fabric reinforced.

2.02 AVAILABLE MANUFACTURES:

A. Sarnafil Inc (Basis of Design)
B. Carlisle SynTec Inc. SureFlex Kee
C. Johns Manville International. Inc. JMKEE SP8RM
1. Thickness: 80 mils (2.0 mm), Minimum

2.03 EXPOSED FACE COLOR: WHITE

A. No other manufacturers are approved.

2.04 PVC ROOFING MEMBRANE

1. Sika Sarnafil Inc. (basis of design)

2.05 BASE BID: 80 MIL MEMBRANE

A. Exposed Face Color: Energy Smart White
B. Membranes
1. Field membrane: Sarnafil S327

2.06 PVC FLASHING MEMBRANE

A. PVC Sheet: ASTM D 4434, Type III, Fabric reinforced.
1. Manufacturers:
   a. Sika Sarnafil Inc.
      1) 2. Flashing Membranes: Precoated fused flashing membrane at all parapets, scuppers, and gravel stops.
      2) Sarnafil G410 - 60 mils
      3) Sarnafil G459 - 60 mils if asphalt contamination exist.
      (a) Sarnafil Sarnaclad metal
      4) 3. Thickness: 60 mils (ASTM tolerances are not acceptable).
      5) 4. Exposed Face Color: Energy Smart White
B. Sarnatherm Rigid Poly-Isocyanurate Foam Insulation Board.
   1. Insulation boards shall be Factory Mutual Class I-120 approved.
   2. Insulation shall have minimum ‘R’ value of 30. Total insulation thickness greater than 2.50 inches thick shall be installed in multiple layers.
   3. Poly-Isocyanurate foam Insulation Board shall be coated glass face.
C. General: Auxiliary materials recommended by roofing system manufacturer for intended use and compatible with membrane roofing.
   1. Liquid-type auxiliary materials shall meet VOC limits of authorities having jurisdiction.
D. Bonding Adhesive: Manufacturer's standard solvent-based bonding adhesive for membrane, and solvent-based bonding adhesive for base flashings.
E. Metal Termination Bars: Manufacturer's standard predrilled stainless-steel or aluminum bars, approximately 1 by 1/8 inch thick; with anchors.
F. Fasteners:

G. Factory-coated steel fasteners and metal plates and/or batten bars meeting corrosion-resistance provisions in FMG 4470, designed for fastening membrane to substrate, and acceptable to membrane roofing system manufacturer. XP and XPN by membrane manufacturer and Rhinobond PVC adhesive coated plates.


2. Sheet metal accessories: hold down cleats, flashing extensions etc. shall be fabricated of 24 gauge galvanized sheet metal unless exposed. Exposed accessories shall be 24 gauge galvanized sheet metal with a Kynar or Hylar finished surface.

3. Miscellaneous Accessories: Provide pourable sealers, preformed cone and vent sheet flashings, preformed inside and outside corner sheet flashings, T-joint covers, termination reglets, cover strips as required by Membrane Manufacture.

4. Damaged or replacement pipe supports shall be MIRO model 3-R-4 by MIRO Industries Inc. 800.768.6978

H. Pipe / Conduit Support: Provide support for pipes and conduits that occur above the roof membrane and is acceptable to the single ply roofing manufacture.

1. Manufactures
   a. Miro Industries.
   b. Advanced support products by ASP, Inc.
      1) Versablock by Freedom Inc.
      2) or approved equal.

2.07 WALKWAYS

A. Flexible Hot Air welded Walkways: A polyester reinforced, 0.096 inch (96 mil), weldable walkway roll with surface embossment. Used as an adhered and hot air welded protection layer from rooftop traffic.

1. Sarnatred: Supplied in rolls of 39.3 inches wide and 32.8 feet long

2. See drawings for required locations.

2.08 SAFETY STRIPING

A. Provide PVC caution yellow warning stripe where indicated on Roof Plan.

1. Continuous weld to roof membrane.

2. Manufacturer: Sika

3. Width: 4 inches

PART 3 EXECUTION

3.01 EXAMINATION

A. Dispose or recycle debris in approved location.

B. Examine substrates, areas, and conditions for compliance with the following requirements and other conditions affecting performance of roofing system:

1. Verify that roof openings and penetrations are in place and set and braced and that roof drains are securely clamped in place.

2. Verify that wood blocking, curbs, and nailers are securely anchored to roof deck at penetrations and terminations and nailers that match thicknesses of insulation.

3. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Prevent materials from entering and clogging roof drains and conduitors and from spilling or migrating onto surfaces of other construction. Remove roof-drain plugs when no work is taking place or when rain is forecast.
B. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing system at the end of the workday or when rain is forecast. Remove and discard temporary seals before beginning work on adjoining roofing.

3.03 INSULATION INSTALLATION

A. Lay out base insulation layer with snug joints and ends. Cut to fit around curbs and pipes. Repeat installation for additional layers of flat stock insulation ensuring that joints and ends of additional insulation are offset a minimum of twelve (12) inches from underlying application. Tapered layers shall be installed in pattern and direction as required by membrane manufacturer to satisfy roof drainage requirements.

B. Install Rhinobond plates in patterns necessary to achieve 120 mile per hour wind speed warranty conditions (Pattern shall be as directed by Membrane Manufacturers Technical Department and as required by the specified wind speed warranty). Secure as required to compliment installation requirements.

C. RHINOBOND FASTENED ROOFING MEMBRANE INSTALLATION

3.04 INSTALL ROOFING MEMBRANE ACCORDING TO ROOFING SYSTEM MANUFACTURER'S WRITTEN INSTRUCTIONS. UNROLL ROOFING MEMBRANE AND ALLOW TO RELAX BEFORE INSTALLING.

A. Start installation of roofing membrane in presence of roofing system manufacturer's technical personnel.

B. Accurately align roofing membranes and maintain uniform side and end laps of minimum dimensions required by manufacturer. Stagger end laps.

C. Induction weld perimeter ends of field membrane to ensure membrane remains stationary during seam welding and to reduce the chance for wrinkles in the finished roof membrane.

D. Seams: Clean seam areas, overlap roofing membrane, and hot-air weld side and end laps of roofing membrane according to manufacturer's written instructions to ensure a watertight seam installation.
   1. Test lap edges with probe to verify seam weld continuity.
   2. Verify field strength of seams a minimum of twice daily and repair seam sample areas. Mark date on samples and retain for Manufacturers technicians review.
   3. Repair tears, voids, and lapped seams in roofing membrane that does not meet requirements.

E. Hot air weld all membrane overlaps (seams) as required by membrane manufacturer.

F. Spread sealant over deck drain flange at deck drains and securely seal roofing membrane in place with clamping ring.

G. Activate the weld between membrane and Rhinobond plate using approved portable induction device. The induction coil must be positioned over the center of the Rhinobond welder, +/- 1 inch (25 mm). Portable induction device must elevate the temperature of the Rhinobond fastener from ambient to 400 - 500 degree F (204 - 260 C). Cycle time will be effected by available power. Use a heavy gauge power cord, at minimum 12 gauge by 100 feet.

H. When induction welding cycle is complete, immediately place a ‘cool and clamp’ magnet weight on the welded Rhinobond fastener. This cooling magnet device must be left in place for at least 60 seconds

I. Provide and install a PVC buffer membrane under all pipe supports.

3.05 MEMBRANE FLASINGS

A. All flashings shall be installed concurrently with the roof membrane as the job progresses. No temporary flashings shall be allowed without the prior approval of the Owner or Owners representative.

B. If any water is allowed to enter under the newly completed roof section, the affected area shall be removed and replaced at the Applicators expense. Flashing shall be adhered to compatible,
dry, smooth and solvent resistant surfaces. Use caution to ensure adhesive fumes are not drawn into the building.

C. Apply adhesive according to membrane manufacturer's directions. Only an area which can be completely covered in the same day's operations shall be flashed. The bonded sheet shall be pressed firmly in place with a hand roller.

D. No adhesive shall be applied in overlap areas to be welded into seams.

E. All flashing terminations shall be in accordance with manufacturers requirements.

3.06 WALKWAY INSTALLATION

A. Flexible Walkways: Install walkway products in locations indicated. Adhere Sarnatred with adhesive followed by hot air welding perimeter edge to surface of roof membrane according to roofing system manufacturer's written instructions.

3.07 FIELD QUALITY CONTROL

A. Final Roof Inspection: Arrange for roofing system manufacturer's technical personnel to inspect roofing installation on completion and submit report to Owner's Representative.

1. Notify Manufacturers Representative, 48 hours in advance of date and time of inspection.

2. Repair or remove and replace components of membrane roofing system where test results or inspections indicate that they do not comply with specified requirements.

a. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

3.08 PROTECTING AND CLEANING

A. Protect membrane roofing system from damage and wear during remainder of construction period.

B. Correct deficiencies in or remove membrane roofing system that does not comply with requirements, repair substrates, and repair or reinstall membrane roofing system to a condition free of damage and deterioration at time of Substantial Completion and according to warranty requirements.

C. Clean overspray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

3.09 ROOFING WARRANTIES

3.10 MANUFACTURER’S WARRANTY:

A. Manufacturer’s Twenty (30) year System No Dollar Limit (NDL).

B. Warranty shall include coverage for wind speeds up to 120 mph.

C. INSTALLERS WARRANTY (Shall include the following):

1. WHEREAS <Insert name> of <Insert address>, herein called the "Roofing Installer," has performed roofing and associated work ("work") on the following project:

2. Property:

3. Address:

4. Building Name/Type:

5. Address:

6. Area of Work:

7. Acceptance Date: <Insert date.>

8. Warranty Period: <Insert time.>

9. Expiration Date: <Insert date.>

D. AND WHEREAS Roofing Installer has contracted (either directly or indirectly as a subcontractor) to warrant said work against leaks and faulty or defective materials and workmanship for designated Warranty Period,

E. NOW THEREFORE Roofing Installer hereby warrants, subject to terms and conditions herein set forth, that during Warranty Period he will, at his own cost and expense, make or cause to be
made such repairs to or replacements of said work as are necessary to correct faulty and
defective work and as are necessary to maintain said work in a watertight condition.

F. This Warranty is made subject to the following terms and conditions:
1. Specifically excluded from this Warranty are damages to work and other parts of the
   building, and to building contents, caused by:
   a. lightning;
   b. peak gust wind speed exceeding 120 mph;
   c. fire;
   d. failure of roofing system substrate, including cracking, settlement, excessive
deflection, deterioration, and decomposition;
   e. faulty construction of parapet walls, copings, chimneys, skylights, vents, equipment
      supports, and other edge conditions and penetrations of the work;
   f. vapor condensation on bottom of roofing; and
   g. activity on roofing by others, including construction contractors, maintenance
      personnel, other persons, and animals, whether authorized or unauthorized by Owner.

   1) When work has been damaged by any of foregoing causes, Warranty shall be
      null and void until such damage has been repaired by Roofing Installer and until
      cost and expense thereof have been paid by Owner or by another responsible
      party so designated.

   2) Roofing Installer is responsible for damage to work covered by this Warranty but
      is not liable for consequential damages to building or building contents resulting
      from leaks or faults or defects of work.

   3) During Warranty Period, if Owner allows alteration of work by anyone other than
      Roofing Installer, including cutting, patching, and maintenance in connection with
      penetrations, attachment of other work, and positioning of anything on roof, this
      Warranty shall become null and void on date of said alterations, but only to the
      extent said alterations affect work covered by this Warranty. If Owner engages
      Roofing Installer to perform said alterations, Warranty shall not become null and
      void unless Roofing Installer, before starting said work, shall have notified
      Owner, showing reasonable cause for claim, that said alterations would likely
      damage or deteriorate work, thereby reasonably justifying a limitation or
      termination of this Warranty.

   4) During Warranty Period, if original use of roof is changed and it becomes used
      for, but was not originally specified for, a promenade, work deck, spray-cooled
      surface, flooded basin, or other use or service more severe than originally
      specified, this Warranty shall become null and void on date of said change, but
      only to the extent said change affects work covered by this Warranty.

   5) Owner shall promptly notify Roofing Installer of observed, known, or suspected
      leaks, defects, or deterioration and shall afford reasonable opportunity for
      Roofing Installer to inspect work and to examine evidence of such leaks, defects,
      or deterioration.

   6) This Warranty is recognized to be the only warranty of Roofing Installer on said
      work and shall not operate to restrict or cut off Owner from other remedies and
      resources lawfully available to Owner in cases of roofing failure. Specifically, this
      Warranty shall not operate to relieve Roofing Installer of responsibility for
      performance of original work according to requirements of the Contract
      Documents, regardless of whether Contract was a contract directly with Owner
      or a subcontract with Owner’s General Contractor.

END OF SECTION
SECTION 07 6200
SHEET METAL FLASHING AND TRIM

PART 1 GENERAL

1.01 RELATED REQUIREMENTS

A. Section 04 2000 - Unit Masonry: Metal flashings embedded in masonry.
B. Section 07 7100 - Roof Specialties: Manufactured copings, flashings, and expansion joint covers.
C. Section 07 7200 - Roof Accessories: Manufactured metal roof curbs.
D. Section 07 9200 - Joint Sealants: Sealing non-lap joints between sheet metal fabrications and adjacent construction.

1.02 REFERENCE STANDARDS

A. AAMA 2603 - Voluntary Specification, Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix); 2017a.
F. ASTM B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate (Metric); 2014.

1.03 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Shop Drawings: Indicate material profile, jointing pattern, jointing details, fastening methods, flashings, terminations, and installation details.
C. Samples: Submit two samples ____by____ inch (____by____ mm) in size illustrating metal finish color.

1.04 QUALITY ASSURANCE

A. Perform work in accordance with SMACNA (ASMM) and CDA A4050 requirements and standard details, except as otherwise indicated.

1.05 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 SHEET MATERIALS

A. Galvanized Steel: ASTM A653/A653M, with G90/Z275 zinc coating; minimum 24 gage, (0.0239 inch) (0.61 mm) thick base metal.

B. Pre-Finished Galvanized Steel: ASTM A653/A653M, with G90/Z275 zinc coating; minimum 24 gage, (0.0239) inch (0.61 mm) 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. Color: As selected by Architect from manufacturer's standard colors.

C. Aluminum: ASTM B209 (ASTM B209M); 20 gage, (0.032 inch) (0.81 mm) thick; anodized finish of color as selected.

D. Pre-Finished Aluminum: ASTM B209 (ASTM B209M); 20 gage, (0.032 inch) (0.81 mm) thick; plain finish shop pre-coated with modified silicone coating.
   2. Fluoropolymer Coating: High Performance Organic Finish, AAMA 2604; multiple coat, thermally cured fluoropolymer finish system.
   3. Color: As selected by Architect from manufacturer's standard colors.

E. Copper: ASTM B370, cold rolled 16 oz/sq ft (24 gage) (0.0216 inch) (0.55 mm) thick; natural finish.

2.02 FABRICATION

A. Form sections true to shape, accurate in size, square, and free from distortion or defects.

B. Hem exposed edges on underside 1/2 inch (13 mm); miter and seam corners.

C. Form material with flat lock seams, except where otherwise indicated; at moving joints, use sealed lapped, bayonet-type or interlocking hooked seams.

D. Fabricate corners from one piece with minimum 18 inch (450 mm) long legs; seal for rigidity, seal with sealant.

E. Fabricate flashings to allow toe to extend 2 inches (50 mm) over roofing gravel. Return and brake edges.

2.03 ACCESSORIES

A. Fasteners: Galvanized steel, with soft neoprene washers.

B. Underlayment: ASTM D226/D226M, organic roofing felt, Type I (No. 15).

C. Primer: Zinc chromate type.

D. Concealed Sealants: Non-curing butyl sealant.

E. Exposed Sealants: ASTM C920; elastomeric sealant, with minimum movement capability as recommended by manufacturer for substrates to be sealed; color to match adjacent material.

F. Plastic Cement: ASTM D4586/D4586M, Type I.

PART 3 EXECUTION

3.01 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 (0.4 mm).
3.02 INSTALLATION

A. Insert flashings into reglets to form tight fit; secure in place with lead wedges; pack remaining spaces with lead wool; seal flashings into reglets with sealant.

B. Secure flashings in place using concealed fasteners, and use exposed fasteners only where permitted.

C. Apply plastic cement compound between metal flashings and felt flashings.

D. Fit flashings tight in place; make corners square, surfaces true and straight in planes, and lines accurate to profiles.

E. Seal metal joints watertight.

3.03 FIELD QUALITY CONTROL

A. See Section 01 4000 - Quality Requirements, for field inspection requirements.

B. Inspection will involve surveillance of work during installation to ascertain compliance with specified requirements.

END OF SECTION
SECTION 07 7123
MANUFACTURED GUTTERS AND DOWNSPOUTS

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Pre-finished aluminum gutters and downspouts.
B. Precast concrete splash pads.

1.02 REFERENCE STANDARDS

1.03 ADMINISTRATIVE REQUIREMENTS
A. Comply with SMACNA (ASMM) for sizing components for rainfall intensity determined by a storm occurrence of 1 in 5 years.
B. Comply with applicable code for size and method of rain water discharge.

1.04 SUBMITTALS
A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Shop Drawings: Indicate locations, configurations, jointing methods, fastening methods, locations, and installation details.
C. Samples: Submit two samples, 6 inch (152 mm) long illustrating component design, finish, color, and configuration.

1.05 DELIVERY, STORAGE, AND HANDLING
A. Stack material to prevent twisting, bending, or abrasion, and to provide ventilation. Slope to drain.
B. Prevent contact with materials that could cause discoloration, staining, or damage.

PART 2 PRODUCTS

2.01 MANUFACTURERS
A. Gutters and Downspouts:
   4. Substitutions: See Section 01 6000 - Product Requirements.

2.02 MATERIALS
A. Polyvinyl Chloride (PVC): ASTM D2665, virgin vinyl, SDR 35 pipe and fittings, high impact type, colorfast; ________ color.
B. Pre-Finished Aluminum Sheet: ASTM B209 (ASTM B209M); 0.032 inch (0.8 mm) thick.
   1. Finish: Plain, shop pre-coated with modified silicone coating.
   2. Color: As selected from manufacturer's standard colors.
2.03 COMPONENTS
A. Gutters: CDA rectangular style profile.
B. Downspouts: CDA Rectangular profile.
C. Connectors: Furnish required connector pieces for PVC (polyvinyl chloride) components.
D. Anchors and Supports: Profiled to suit gutters and downspouts.
   1. Anchoring Devices: In accordance with CDA requirements.
   2. Gutter Supports: Brackets.
   3. Downspout Supports: Brackets.
E. Fasteners: Galvanized steel, with soft neoprene washers.

2.04 ACCESSORIES
A. Splash Pads: Precast concrete type, size and profiles indicated; minimum 3000 psi (21 MPa) at 28 days, with minimum 5 percent air entrainment.
B. Downspout Boots: Plastic.

2.05 FABRICATION
A. Form gutters and downspouts of profiles and size indicated.
B. Fabricate with required connection pieces.
C. Form sections square, true, and accurate in size, in maximum possible lengths, free of distortion or defects detrimental to appearance or performance. Allow for expansion at joints.
D. Hem exposed edges of metal.
E. Fabricate gutter and downspout accessories; seal watertight.

2.06 FINISHES
A. Fluoropolymer Coating: High Performance Organic Finish, AAMA 2604; multiple coat, thermally cured fluoropolymer finish system; color as selected from manufacturer's standard colors.
B. Primer Coat: Finish concealed side of metal sheets with primer compatible with finish system, as recommended by finish system manufacturer.

PART 3 EXECUTION
3.01 EXAMINATION
A. Verify existing conditions before starting work.
B. Verify that surfaces are ready to receive work.

3.02 PREPARATION
A. Paint concealed metal surfaces and surfaces in contact with dissimilar metals with protective backing paint to a minimum dry film thickness of 15 mil (0.4 mm).

3.03 INSTALLATION
A. Install gutters, downspouts, and accessories in accordance with manufacturer's instructions.
B. Slope gutters 1/8 inch per foot (3.175 mm/m).
C. Set splash pans under downspouts.

END OF SECTION
SECTION 07 7200
ROOF ACCESSORIES

PART 1 GENERAL
1.01 SECTION INCLUDES
A. Roof penetrations mounting curbs.
B. Roof hatches, manual and automatic operation, including smoke vents.
C. Roof snow and ice melting system.

1.02 REFERENCE STANDARDS

1.03 SUBMITTALS
A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Product Data: Manufacturer's data sheets on each product to be used.
   1. Preparation instructions and recommendations.
   2. Storage and handling requirements and recommendations.
   3. Installation methods.
   4. Maintenance requirements.
C. Shop Drawings: Submit detailed layout developed for this project and provide dimensioned location and number for each type of roof accessory.
D. Warranty Documentation:
   1. Submit manufacturer warranty.
   2. Ensure that forms have been completed in Owner's name and registered with manufacturer.
   3. Submit documentation that roof accessories are acceptable to roofing manufacturer, and do not limit the roofing warranty.

1.04 WARRANTY
A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

PART 2 PRODUCTS
2.01 ROOF HATCHES AND VENTS, MANUAL AND AUTOMATIC OPERATION
A. Sound Rated Roof Hatch Manufacturers:
   1. BILCO Company: www.bilco.com/#sle.
   3. Substitutions: See Section 01 6000 - Product Requirements.
B. Roof Hatch Manufacturers:
   2. BILCO Company; Type NB-50TB Ships Ladder: www.bilco.com/#sle.
   4. Substitutions: See Section 01 6000 - Product Requirements.
C. Roof Hatches and Smoke Vents: Factory-assembled aluminum frame and cover, complete with operating and release hardware.
   1. Style: Provide flat metal covers unless otherwise indicated.
   2. Mounting Substrate: Provide frames and curbs suitable for mounting on corrugated metal roof deck with insulation.
   3. Thermally Broken Hatches: Added insulation to frame and cover; available in each manufacturer's standard, single leaf sizes; special sizes available upon request
   4. Provide safety post at roof hatch.
D. Frames and Curbs: One-piece curb and frame with integral cap flashing to receive roof flashings; extended bottom flange to suit mounting.
   1. Material: Mill finished aluminum, 11 gage, 0.0907 inch (2.3 mm) thick.
2. Insulation: Manufacturer's standard; 1 inch (25 mm) rigid glass fiber, located on outside face of curb.
3. Curb Height: 18 inches (225 mm) from surface of roof deck, minimum.

E. Metal Covers: Flush, insulated, hollow metal construction.
   1. Capable of supporting 40 psf (1.92 kPa) live load.
   2. Material: Mill finished aluminum; outer cover 11 gage, 0.0907 inch (2.3 mm) thick, liner 0.04 inch (1.0 mm) thick.
   3. Insulation: Manufacturer's standard 1 inch (25 mm) rigid glass fiber.

F. Hardware: Steel, zinc coated and chromate sealed, unless otherwise indicated or required by manufacturer.
   1. Lifting Mechanisms: Compression or torsion spring operator with shock absorbers that automatically opens upon release of latch; capable of lifting covers despite 10 psf (475 kPa) load.
   2. Hinges: Heavy duty pintle type.
   3. Hold open arm with vinyl-coated handle for manual release.

2.02 ROOF SNOW AND ICE MELTING SYSTEMS
A. Roof Snow and Ice Melting Systems: Self-regulating heating cable system for roof and gutter applications to melt snow and ice.
   1. Application: Roofing system with gutter.
   2. Provide cable spacing and number of heating circuits and accessories in accordance with manufacturer's written requirements.
   4. See Electrical specifications for more information.

PART 3 EXECUTION
3.01 EXAMINATION
   A. Do not begin installation until substrates have been properly prepared.
   B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.02 PREPARATION
   A. Clean surfaces thoroughly prior to installation.
   B. Prepare surfaces using methods recommended by manufacturer for achieving acceptable results for applicable substrate under project conditions.

3.03 INSTALLATION
   A. Install in accordance with manufacturer's instructions, in manner that maintains roofing system weather-tight integrity.

3.04 CLEANING
   A. Clean installed work to like-new condition.

3.05 PROTECTION
   A. Protect installed products until completion of project.
   B. Touch-up, repair or replace damaged products before Date of Substantial Completion.

END OF SECTION
SECTION 07 8100
APPLIED FIREPROOFING

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Fireproofing of interior structural steel not exposed to damage or moisture.

1.02 RELATED REQUIREMENTS
A. Section 05 1200 - Structural Steel Framing.
B. Section 05 2100 - Steel Joist Framing.
C. Section 05 3100 - Steel Decking.

1.03 REFERENCE STANDARDS

1.04 ADMINISTRATIVE REQUIREMENTS
A. Coordinate with placement of ceiling hanger tabs, mechanical component hangers, and electrical components.
B. Preinstallation Meeting: Convene one week before starting work of this section.

1.05 SUBMITTALS
A. See Section 01 3000 - Administrative Requirements, for submittals procedures.
B. Product Data: Provide data indicating product characteristics.
C. Manufacturer's Certificate: Certify that applied fireproofing products meet or exceed requirements of Contract Documents.
D. Test Reports: Reports from reputable independent testing agencies for proposed products, indicating compliance with specified criteria, conducted under conditions similar to those on project, as follows:
   1. Bond strength.
   2. Bond impact.
   3. Compressive strength.
   4. Fire tests using substrate materials similar those on project.
E. Manufacturer's Qualification Statement.

1.06 QUALITY ASSURANCE
A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years of documented experience.
B. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years of documented experience.
1.07 FIELD CONDITIONS
A. Do not apply fireproofing when temperature of substrate material and surrounding air is below 40 degrees F (4 degrees C) or when temperature is predicted to be below said temperature for 24 hours after application.
B. Provide ventilation in areas to receive fireproofing during application and 24 hours afterward, to dry applied material.
C. Provide temporary enclosure to prevent spray from contaminating air.

1.08 WARRANTY
A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
B. Correct defective Work within a two year period after Date of Substantial Completion.
   1. Include coverage for fireproofing to remain free from cracking, checking, dusting, flaking, spalling, separation, and blistering.
   2. Reinstall or repair failures that occur within warranty period.

PART 2 PRODUCTS
2.01 MANUFACTURERS
A. Applied Fireproofing:
   4. Substitutions: See Section 01 6000 - Product Requirements.

2.02 FIREPROOFING ASSEMBLIES
A. Provide assemblies as indicated on drawings.
B. Provide fire resistance ratings for following building elements as required by local building code:
   1. Roof construction, including supporting beams and joists, ________ hours.
C. Provide UL fire-rated assemblies to hourly ratings as follows:
   1. Interior roof deck: Two hours.

2.03 MATERIALS
A. Applied Fireproofing Material for Interior Applications, Concealed: Manufacturer's standard factory mixed material, which when combined with water is capable of providing indicated fire resistance, and complying with following requirements:
   1. Bond Strength: 150 pounds per square foot (7.2 kPa), minimum, when tested in accordance with ASTM E736/E736M when set and dry.
   2. Dry Density: As required by fire resistance design.
   3. Compressive Strength: 8.33 pounds per square inch (57.4 kPa), minimum.
   4. Effect of Impact on Bonding: No cracking, spalling or delamination, when tested in accordance with ASTM E760/E760M.
   5. Corrosivity: No evidence of corrosion, when tested in accordance with ASTM E937/E937M.
   6. Air Erosion Resistance: Weight loss of 0.025 g/sq ft (0.27 g/sq m), maximum, when tested in accordance with ASTM E859/E859M after 24 hours.
   7. Surface Burning Characteristics: Maximum flame spread index of 0 (zero) and maximum smoke developed index of 0 (zero), when tested in accordance with ASTM E84.
   8. Effect of Deflection: No cracking, spalling, or delamination, when tested in accordance with ASTM E759/E759M.

2.04 ACCESSORIES
A. Primer Adhesive: Of type recommended by applied fireproofing manufacturer.
B. Water: Clean, potable.
PART 3  EXECUTION

3.01  EXAMINATION
A. Verify that surfaces are ready to receive fireproofing.
B. Verify that clips, hangers, supports, sleeves, and other items required to penetrate fireproofing are in place.
C. Verify that ducts, piping, equipment, or other items that would interfere with application of fireproofing have not been installed.
D. Verify that voids and cracks in substrate have been filled.
E. Verify that projections have been removed where fireproofing will be exposed to view as a finish material.

3.02  PREPARATION
A. Perform tests as recommended by fireproofing manufacturer in applications where adhesion of fireproofing to substrate is in question.
B. Remove incompatible materials that could effect bond by scraping, brushing, scrubbing, or sandblasting.
C. Prepare substrates to receive fireproofing in strict accordance with instructions of fireproofing manufacturer.
D. Apply fireproofing manufacturer's recommended bonding agent on primed steel.
E. Protect surfaces not scheduled for fireproofing and equipment from damage by overspray, fall-out, and dusting.
F. Close off and seal duct work in areas where fireproofing is being applied.

3.03  APPLICATION
A. Apply primer adhesive in accordance with manufacturer’s instructions.
B. Apply fireproofing in uniform thickness and density as necessary to achieve required ratings.

3.04  FIELD QUALITY CONTROL
A. Perform field inspection and testing in accordance with Section 01 4000 - Quality Requirements.
B. Inspect installed fireproofing after application and curing for integrity, prior to its concealment.
C. Ensure that actual thicknesses, densities, and bond strengths meet requirements for specified ratings and requirements of authorities having jurisdiction (AHJ).
D. Re-inspect installed fireproofing for integrity of fire protection, after installation of subsequent Work.

3.05  CLEANING
A. Remove excess material, overspray, droppings, and debris.
B. Remove fireproofing from materials and surfaces not required to be fireproofed.

END OF SECTION
SECTION 07 8400
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 01 6116 - Volatile Organic Compound (VOC) Content Restrictions.
   B. Section 01 7000 - Execution and Closeout Requirements: Cutting and patching.
   C. Section 09 2116 - Gypsum Board Assemblies: Gypsum wallboard fireproofing.

1.03 REFERENCE STANDARDS
   G. ITS (DIR) - Directory of Listed Products; current edition.

1.04 SUBMITTALS
   A. See Section 01 3000 - 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.

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 UL (FRD), FM (AG), or ITS (DIR) 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 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. Verification of minimum three years documented experience installing work of this type.
2. Verification of at least five satisfactorily completed projects of comparable size and type.

1.06 FIELD CONDITIONS

A. Comply with firestopping manufacturer’s recommendations for temperature and conditions during and after installation; maintain minimum temperature before, during, and for three days after installation of materials.

B. Provide ventilation in areas where solvent-cured materials are being installed.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Firestopping Manufacturers:
   1. 3M Fire Protection Products; _____: www.3m.com/firestop/#sle.
   7. Substitutions: See Section 01 6000 - Product Requirements.

2.02 MATERIALS

A. Firestopping Materials: Any materials meeting requirements.

B. Mold and Mildew Resistance: Provide firestopping materials with mold and mildew resistance rating of zero(0) in accordance with ASTM G21.

C. Primers, Sleeves, Forms, Insulation, Packing, Stuffing, and Accessories: Provide type of materials as required for tested firestopping assembly.

D. Fire Ratings: Refer to drawings for required systems and ratings.

2.03 FIRESTOPPING ASSEMBLY REQUIREMENTS

A. Perimeter Fire Containment Firestopping: Use system that has been tested according to ASTM E2307 to have fire resistance F Rating equal to required fire rating of floor assembly.

B. Head-of-Wall Joint System Firestopping at Joints Between Fire-Rated Wall Assemblies and Non-Rated Horizontal Assemblies: Use system that has been tested according to ASTM E2837 to have fire resistance F Rating equal to required fire rating of floor or wall, whichever is greater.

C. Floor-to-Floor, Wall-to-Wall, and Wall-to-Floor Joints, Except Perimeter, Where Both Are Fire-Rated: Use system that has been tested according to ASTM E1966 or UL 2079 to have fire resistance F Rating equal to required fire rating of the assembly in which the joint occurs.

D. Through Penetration Firestopping: Use system that has been tested according to ASTM E814 to have fire resistance F Rating equal to required fire rating of penetrated assembly.

2.04 FIRESTOPPING SYSTEMS

A. Firestopping: Any material meeting requirements.

1. Fire Ratings: Use system that is listed by FM (AG), ITS (DIR), or UL (FRD) and tested in accordance with ASTM E814, ASTM E119, or UL 1479 with F Rating equal to fire rating of penetrated assembly and minimum T Rating Equal to F Rating and in compliance with other specified requirements.

2. Fire Ratings: See drawings for required systems and ratings.
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 materials that could adversely affect bond of firestopping material.
   B. Remove incompatible materials that could adversely affect bond.

3.03  INSTALLATION
   A. Install materials in manner described in fire test report and in accordance with manufacturer’s instructions, completely closing openings.
   B. Install labeling required by code.

3.04  CLEANING
   A. Clean adjacent surfaces of firestopping materials.

3.05  PROTECTION
   A. Protect adjacent surfaces from damage by material installation.

END OF SECTION
SECTION 07 9100
PREFORMED JOINT SEALS

PART 1 GENERAL
1.01 SECTION INCLUDES
A. Precompressed foam seals.
B. Compression gaskets.
C. Preformed strip seals.

1.02 RELATED REQUIREMENTS

1.03 REFERENCE STANDARDS

1.04 SUBMITTALS
A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Product Data: Manufacturer's technical data sheets for each product, including chemical composition, movement capability, color availability, limitations on application, and installation instructions.

1.05 WARRANTY
A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
B. Correct defective work within a two year period after Date of Substantial Completion.
C. Warranty: Include coverage for installed sealers that fail to achieve watertight seal or exhibit loss of adhesion or cohesion.

PART 2 PRODUCTS
2.01 MANUFACTURERS
A. Precompressed Foam Seals:
B. Compression Gaskets:
C. Preformed Strip Seals:

2.02 PRECOMPRESSED FOAM SEALS
A. Precompressed Foam Seal: Urethane foam impregnated with water-repellent, with self-adhesive faces protected prior to installation by release paper.
2. Size as required to provide weathertight seal when installed.

2.03 COMPRESSION GASKETS

2.04 PREFORMED STRIP SEALS
A. Preformed Strip Seal: Factory formed profile for adhered application to face of joint substrate.
1. Measure size of existing joints before selecting seal width.
2. Provide compatible materials for application as recommended by manufacturer.
3. Applications:
   a. Exterior wall expansion joints.
   b. Door and window perimeter joints.
4. Manufacturers:
   b. Substitutions: See Section 01 6000 - Product Requirements.
2.05 ACCESSORIES
   A. Adhesive: As recommended by seal manufacturer.
   B. Masking Tape: Self-adhesive, nonabsorbent, non-staining, removable without adhesive residue, and compatible with surfaces adjacent to joints and strip seal.
   C. Substrate Cleaner: Non-corrosive, non-staining type recommended by seal manufacturer; compatible with joint forming materials.
   D. Primer: Type recommended by seal manufacturer to suit application; non-staining.
   E. Backing Tape: Self-adhesive polyethylene tape with surface that seal will not adhere to.

PART 3 EXECUTION

3.01 EXAMINATION
   A. Verify that joints are ready to receive this work.
   B. Measure joint dimensions and verify that seal products are of the correct size to properly seal the joints.

3.02 PREPARATION
   A. Properly prepare construction components adjacent to the work of this section to prevent damage and disfigurement due to this work.

3.03 INSTALLATION
   A. Install in accordance with manufacturer's written instructions.
   B. Precompressed Foam Seals:
      1. Install only when ambient temperature is within recommended application temperature range of adhesive. Consult manufacturer when installing outside this temperature range.
      2. Prepare joints and install seals in accordance with manufacturer's written recommendations.
      3. Remove loose materials and foreign matter that could impair adhesion of sealant.
      4. Do not stretch precompressed seal; avoid joints except at corners, ends, and intersections; install with face 1/8 to 1/4 inch (3 to 6 mm) below adjoining surface.
   C. Compression Gaskets:
      1. Install only when ambient temperature is within recommended application temperature range of adhesive. Consult manufacturer when installing outside this temperature range.
      2. Prepare joints and install seals in accordance with manufacturer's written recommendations.
      3. Remove loose materials and foreign matter that could impair adhesion of sealant.
      4. Avoid joints except at ends, corners, and intersections; seal joints with adhesive; install with face 1/8 to 1/4 inch (3 to 6 mm) below adjoining surface.
   D. Preformed Strip Seals:
      1. Install when ambient temperature is within recommended application temperature range of adhesive, and consult with manufacturer before installing outside this temperature range.
      2. Prepare joints and install seals in accordance with manufacturer's written recommendations.
      3. Remove loose materials and foreign matter that could impair adhesion.
      4. When installing over existing non-functioning sealant, remove portions of existing installation that protrude beyond surface; install backing tape on surface of existing sealant installation to prevent adhesion of strip seal.

3.04 CLEANING
   A. Clean adjacent soiled surfaces.

3.05 PROTECTION
   A. Protect joints from damage until adhesives have properly cured.

END OF SECTION
SECTION 07 9200
JOINT SEALANTS

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Nonsag gunnable joint sealants.
B. Self-leveling pourable joint sealants.
C. Joint backings and accessories.

1.02 RELATED REQUIREMENTS
A. Section 01 6116 - Volatile Organic Compound (VOC) Content Restrictions: Additional requirements for sealants and primers.
B. Section 07 2500 - Weather Barriers: Sealants required in conjunction with air barriers and vapor retarders.
C. Section 08 7100 - Door Hardware: Setting exterior door thresholds in sealant.
D. Section 08 8000 - Glazing: Glazing sealants and accessories.
E. Section 09 2116 - Gypsum Board Assemblies: Sealing acoustical and sound-rated walls and ceilings.
F. Section 09 3000 - Tiling: Sealant between tile and plumbing fixtures and at junctions with other materials and changes in plane.
G. Section 23 3100 - HVAC Ducts and Casings: Duct sealants.

1.03 REFERENCE STANDARDS
C. ASTM C919 - Standard Practice for Use of Sealants in Acoustical Applications; 2012 (Reapproved 2017).

1.04 SUBMITTALS
A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Product Data for Sealants: Submit manufacturer's technical data sheets for each product to be used, that includes the following.
   1. Physical characteristics, including movement capability, VOC content, hardness, cure time, and color availability.
   2. List of backing materials approved for use with the specific product.
   3. Substrates the product should not be used on.
C. Color Cards for Selection: Where sealant color is not specified, submit manufacturer's color cards showing standard colors available for selection.
1.05 WARRANTY
   A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
   B. Correct defective work within a five year period after Date of Substantial Completion.
   C. Warranty: Include coverage for installed sealants and accessories that fail to achieve watertight seal, exhibit loss of adhesion or cohesion, or do not cure.

PART 2 PRODUCTS
2.01 MANUFACTURERS
   A. Non-Sag Sealants: Permits application in joints on vertical surfaces without sagging or slumping.
   B. Self-Leveling Sealants: Pourable or self-leveling sealant that has sufficient flow to form a smooth, level surface when applied in a horizontal joint.

2.02 JOINT SEALANT APPLICATIONS
   A. Scope:
      1. Exterior Joints: Seal open joints, whether or not the joint is indicated on drawings, unless specifically indicated not to be sealed. Exterior joints to be sealed include, but are not limited to, the following items.
         a. Wall expansion and control joints.
         b. Joints between door, window, and other frames and adjacent construction.
         c. Joints between different exposed materials.
         d. Openings below ledge angles in masonry.
         e. Other joints indicated below.
      2. Interior Joints: Do not seal interior joints unless specifically indicated to be sealed. Interior joints to be sealed include, but are not limited to, the following items.
         a. Joints between door, window, and other frames and adjacent construction.
         b. In sound-rated wall and ceiling assemblies, gaps at electrical outlets, wiring devices, piping, and other openings; between wall/ceiling and other construction; and other flanking sound paths.
         c. Other joints indicated below.
      3. Do not seal the following types of joints.
         a. Intentional weepholes in masonry.
         b. Joints indicated to be treated with manufactured expansion joint cover or some other type of sealing device.
         c. Joints where sealant is specified to be provided by manufacturer of product to be sealed.
         d. Joints where installation of sealant is specified in another section.
         e. Joints between suspended panel ceilings/grid and walls.
   B. Exterior Joints: Use non-sag non-staining silicone sealant, unless otherwise indicated.
   C. Interior Joints: Use non-sag polyurethane sealant, unless otherwise indicated.
3. Joints between Fixtures in Wet Areas and Floors, Walls, and Ceilings: Mildew-resistant silicone sealant; white.
4. In Sound-Rated Assemblies: Acrylic emulsion latex sealant.

D. Interior Wet Areas: restrooms and other sink locations; fixtures in wet areas include plumbing fixtures, countertops, cabinets, and other similar items.
E. Sound-Rated Assemblies: Walls and ceilings identified as "STC-rated", "sound-rated", or "acoustical".

2.03 JOINT SEALANTS - GENERAL
A. Sealants and Primers: Provide products having lower volatile organic compound (VOC) content than indicated in SCAQMD 1168.

2.04 NONSAG JOINT SEALANTS
A. Non-Staining Silicone Sealant: ASTM C920, Grade NS, Uses M and A; not expected to withstand continuous water immersion or traffic.
2. Non-Staining To Porous Stone: Non-staining to light-colored natural stone when tested in accordance with ASTM C1248.
3. Dirt Pick-Up: Reduced dirt pick-up compared to other silicone sealants.
4. Color: To be selected by Architect from manufacturer's full range.
5. Cure Type: _______.
6. Service Temperature Range: Minus 20 to 180 degrees F (Minus 29 to 82 degrees C).
7. Manufacturers:
   g. Sika Corporation; Sikasil 728NS: www.usa-sika.com/#sle.
   h. Substitutions: See Section 01 6000 - Product Requirements.
B. Silicone Sealant: ASTM C920, Grade NS, Uses M and A; not expected to withstand continuous water immersion or traffic.
2. Color: To be selected by Architect from manufacturer's standard range.
3. Manufacturers:
   b. Pecora Corporation; Pecora 890FTS-TXTR (Field Tintable Textured): www.pecora.com/#sle.
   f. Sika Corporation; Sikasil 728NS: www.usa-sika.com/#sle.
   g. Substitutions: See Section 01 6000 - Product Requirements.
C. Mildew-Resistant Silicone Sealant: ASTM C920, Grade NS, Uses M and A; single component, mildew resistant; not expected to withstand continuous water immersion or traffic.
2. Manufacturers:
c. Substitutions: See Section 01 6000 - Product Requirements.

D. Polyurethane Sealant: ASTM C920, Grade NS, Uses M and A; single or multi-component; not expected to withstand continuous water immersion or traffic.
1. Movement Capability: Plus and minus ____ percent, minimum.
2. Color: To be selected by Architect from manufacturer's standard range.
3. Manufacturers:
   f. Sika Corporation; Sikaflex-2c NS: www.usa-sika.com/#sle.

E. Polyurethane Sealant for Continuous Water Immersion: ASTM C920, Grade NS, Uses M and A; single or multi-component; explicitly approved by manufacturer for continuous water immersion; suitable for traffic exposure when recessed below traffic surface.
1. Movement Capability: Plus and minus 35 percent, minimum.
2. Color: To be selected by Architect from manufacturer's standard range.
3. Manufacturers:
   b. Sika Corporation; Sikaflex-2c NS: www.usa-sika.com/#sle.
   c. Substitutions: See Section 01 6000 - Product Requirements.

F. Non-Sag "Traffic-Grade" Polyurethane Sealant: ASTM C920, Grade NS, Uses M and A; single or multi-component; explicitly approved by manufacturer for continuous water immersion and traffic without the necessity to recess sealant below traffic surface.
2. Hardness Range: 40 to 50, Shore A, when tested in accordance with ASTM C661.
3. Color: To be selected by Architect from manufacturer's standard range.

G. Polysulfide Sealant for Continuous Water Immersion: Polysulfide; ASTM C920, Grade NS, Uses M and A; single component; explicitly approved by manufacturer for continuous water immersion; not expected to withstand traffic.
3. Color: To be selected by Architect from manufacturer's standard range.

H. Type ____ - Acrylic Emulsion Latex: Water-based; ASTM C834, single component, non-staining, non-bleeding, non-sagging; not intended for exterior use.

2.05 SELF-LEVELING SEALANTS

   2. Manufacturers:
      b. Substitutions: See Section 01 6000 - Product Requirements.

2.06 ACCESSORIES

A. Backer Rod: Cylindrical cellular foam rod with surface that sealant will not adhere to, compatible with specific sealant used, and recommended by backing and sealant manufacturers for specific application.
1. Type for Joints Subject to Pedestrian or Vehicular Traffic: ASTM C1330; Type B - Bi-Cellular Polyethylene.
2. Closed Cell and Bi-Cellular: 25 to 33 percent larger in diameter than joint width.
3. Manufacturers:
   a. Substitutions: See Section 01 6000 - Product Requirements.

B. Overlay Extrusion for Glazing System Joint Protection: Rubber profiled extrusions placed over joints in glazing system and provided with watertight seal.
   1. Profile: As required to match existing metal glazing cap requirements.
   2. Color: As required to match existing conditions.
   3. Durometer Hardness, Type A: 65, minimum, when tested in accordance with ASTM D2240.
   4. Tensile Strength: 1139 psi (7.8 MPa), in accordance with ASTM D412.

C. Backing Tape: Self-adhesive polyethylene tape with surface that sealant will not adhere to and recommended by tape and sealant manufacturers for specific application.

D. Masking Tape: Self-adhesive, nonabsorbent, non-staining, removable without adhesive residue, and compatible with surfaces adjacent to joints and sealants.

E. Joint Cleaner: Non-corrosive and non-staining type, type recommended by sealant manufacturer; compatible with joint forming materials.

F. Primers: Type recommended by sealant manufacturer to suit application; non-staining.

PART 3 EXECUTION

3.01 EXAMINATION
   A. Verify that joints are ready to receive work.
   B. Verify that backing materials are compatible with sealants.
   C. Verify that backer rods are of the correct size.

3.02 PREPARATION
   A. Remove loose materials and foreign matter that could impair adhesion of sealant.
   B. Clean joints, and prime as necessary, in accordance with manufacturer's instructions.
   C. Perform preparation in accordance with manufacturer's instructions and ASTM C1193.
   D. Mask elements and surfaces adjacent to joints from damage and disfigurement due to sealant work; be aware that sealant drips and smears may not be completely removable.

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:
      2. Neck dimension no greater than 1/3 of the joint width.
      3. Surface bond area on each side not less than 75 percent of joint width.
   E. Install bond breaker backing tape where backer rod cannot be used.
   F. Install sealant free of air pockets, foreign embedded matter, ridges, and sags, and without getting sealant on adjacent surfaces.
   G. Do not install sealant when ambient temperature is outside manufacturer's recommended temperature range, or will be outside that range during the entire curing period, unless manufacturer's approval is obtained and instructions are followed.
H. Nonsag Sealants: Tool surface concave, unless otherwise indicated; remove masking tape immediately after tooling sealant surface.

3.04 FIELD QUALITY CONTROL

A. Perform field quality control inspection/testing as specified in PART 1 under QUALITY ASSURANCE article.

B. Remove and replace failed portions of sealants using same materials and procedures as indicated for original installation.

3.05 POST-OCCUPANCY

A. Post-Occupancy Inspection: Perform visual inspection of entire length of project sealant joints at a time that joints have opened to their greatest width; i.e. at low temperature in thermal cycle. Report failures immediately and repair.

END OF SECTION
SECTION 08 1113
HOLLOW METAL DOORS AND FRAMES

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Non-fire-rated hollow metal doors and frames.
B. Hollow metal frames for wood doors.
C. Thermally insulated hollow metal doors with frames.
D. Hollow metal borrowed lites glazing frames.

1.02 RELATED REQUIREMENTS
A. Section 08 7100 - Door Hardware.
B. Section 08 8000 - Glazing: Glass for doors and borrowed lites.

1.03 ABBREVIATIONS AND ACRONYMS
B. HMMA: Hollow Metal Manufacturers Association.
D. SDI: Steel Door Institute.
E. UL: Underwriters Laboratories.

1.04 REFERENCE STANDARDS
C. ANSI/SDI A250.8 - Specifications for Standard Steel Doors and Frames (SDI-100); 2014.
H. BHMA A156.115 - American National Standard for Hardware Preparation in Steel Doors and Steel Frames; 2016.
K. NAAMM HMMA 831 - Hardware Locations for Hollow Metal Doors and Frames; 2011.

1.05 SUBMITTALS
A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Product Data: Materials and details of design and construction, hardware locations, reinforcement type and locations, anchorage and fastening methods, and finishes.
C. Shop Drawings: Details of each opening, showing elevations, glazing, frame profiles, and any indicated finish requirements.
D. Manufacturer's Qualification Statement.

1.06 QUALITY ASSURANCE
A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years documented experience.
B. Maintain at project site copies of reference standards relating to installation of products specified.

1.07 DELIVERY, STORAGE, AND HANDLING
A. Comply with NAAMM HMMA 840 or ANSI/SDI A250.8 (SDI-100) in accordance with specified requirements.
B. Protect with resilient packaging; avoid humidity build-up under coverings; prevent corrosion and adverse effects on factory applied painted finish.

PART 2 PRODUCTS
2.01 PERFORMANCE REQUIREMENTS
A. Requirements for Hollow Metal Doors and Frames:
   1. Steel Sheet: Comply with one or more of the following requirements; galvannealed steel complying with ASTM A653/A653M, cold-rolled steel complying with ASTM A1008/A1008M, or hot-rolled pickled and oiled (HRPO) steel complying with ASTM A1011/A1011M, commercial steel (CS) Type B, for each.
   2. Accessibility: Comply with ICC A117.1 and ADA Standards.
   3. Exterior Door Top Closures: Flush end closure channel, with top and door faces aligned.
   4. Door Edge Profile: Manufacturers standard for application indicated.
   5. Typical Door Face Sheets: Flush.
   7. Hardware Preparations, Selections and Locations: Comply with NAAMM HMMA 830 and NAAMM HMMA 831 or BHMA A156.115 and ANSI/SDI A250.8 (SDI-100) in accordance with specified requirements.
   8. Zinc Coating for Typical Interior and/or Exterior Locations: Provide metal components zinc-coated (galvanized) and/or zinc-iron alloy-coated (galvannealed) by the hot-dip process in accordance with ASTM A653/A653M, with manufacturer's standard coating thickness, unless noted otherwise for specific hollow metal doors and frames.
      a. Based on SDI Standards: Provide at least A40/ZF120 (galvannealed) when necessary, coating not required for typical interior door applications, and at least A60/ZF180 (galvannealed) for corrosive locations.
B. Combined Requirements: If a particular door and frame unit is indicated to comply with more than one type of requirement, comply with the specified requirements for each type; for instance, an exterior door that is also indicated as being sound-rated must comply with the requirements specified for exterior doors and for sound-rated doors; where two requirements conflict, comply with the most stringent.

2.02 HOLLOW METAL DOORS
A. Exterior Doors: Thermally insulated.
   1. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).
      a. Level 2 - Heavy-duty.
      b. Physical Performance Level B, 500,000 cycles; in accordance with ANSI/SDI A250.4.
      c. Model 1 - Full Flush.
      d. Door Face Metal Thickness: 18 gage, 0.042 inch (1.0 mm), minimum.
      e. Zinc Coating: A60/ZF180 galvannealed coating; ASTM A653/A653M.
   2. Door Core Material: Vertical steel stiffeners with fiberglass batts.
3. Door Thermal Resistance: R-Value of ___.
4. Door Thickness: 1-3/4 inch (44.5 mm), nominal.
5. Weatherstripping: Refer to Section 08 7100.

B. Interior Doors, Non-Fire Rated:
1. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).
   a. Level 2 - Heavy-duty.
   b. Physical Performance Level B, 500,000 cycles; in accordance with ANSI/SDI A250.4.
   c. Model 1 - Full Flush.
   d. Door Face Metal Thickness: 18 gage, 0.042 inch (1.0 mm), minimum.
2. Door Thickness: 1-3/4 inch (44.5 mm), nominal.
3. Door Finish: Factory primed and field finished.

2.03 HOLLOW METAL FRAMES
A. Comply with standards and/or custom guidelines as indicated for corresponding door in accordance with applicable door frame requirements.
B. Frame Finish: Factory primed and field finished.
C. Exterior Door Frames: Full profile/continuously welded type.
   1. Galvanizing: Components hot-dipped zinc-iron alloy-coated (galvannealed) in accordance with ASTM A653/A653M, with A40/ZF120 coating.
   2. Frame Metal Thickness: 18 gage, 0.042 inch (1.0 mm), minimum.
   3. Weatherstripping: Separate, see Section 08 7100.
D. Interior Door Frames, Non-Fire Rated: Full profile/continuously welded type.
   1. Frame Metal Thickness: 18 gage, 0.042 inch (1.0 mm), minimum.
E. Frames for Wood Doors: Comply with frame requirements in accordance with corresponding door.
F. Borrowed Lites Glazing Frames: Construction and face dimensions to match door frames, and as indicated on drawings.
G. Provide mortar guard boxes for hardware cut-outs in frames to be installed in masonry or to be grouted.
H. Frames in Masonry Walls: Size to suit masonry coursing with head member 4 inch (102 mm) high to fill opening without cutting masonry units.

2.04 FINISHES
A. Primer: Rust-inhibiting, complying with ANSI/SDI A250.10, door manufacturer's standard.
B. Bituminous Coating: Asphalt emulsion or other high-build, water-resistant, resilient coating.

2.05 ACCESSORIES
A. Glazing: As specified in Section 08 8000, factory installed.
B. Removable Stops: Rolled steel bar, shape as indicated on drawings, mitered or butted corners; prepared for countersink style tamper proof screws.
C. Grout for Frames: Portland cement grout with maximum 4 inch (102 mm) slump for hand troweling; thinner pumpable grout is prohibited.
D. Silencers: Resilient rubber, fitted into drilled hole; provide three on strike side of single door, three on center mullion of pairs, and two on head of pairs without center mullions.
E. Temporary Frame Spreaders: Provide for factory- or shop-assembled frames.

PART 3 EXECUTION
3.01 EXAMINATION
A. Verify existing conditions before starting work.
B. Verify that opening sizes and tolerances are acceptable.
C. Verify that finished walls are in plane to ensure proper door alignment.

3.02 PREPARATION
   A. Coat inside of frames to be installed in masonry or to be grouted, with bituminous coating, prior to installation.

3.03 INSTALLATION
   A. Install doors and frames in accordance with manufacturer’s instructions and related requirements of specified door and frame standards or custom guidelines indicated.
   B. Coordinate frame anchor placement with wall construction.
   C. Grout frames in masonry construction, using hand trowel methods; brace frames so that pressure of grout before setting will not deform frames.
   D. Install door hardware as specified in Section 08 7100.
   E. Coordinate installation of electrical connections to electrical hardware items.

3.04 ADJUSTING
   A. Adjust for smooth and balanced door movement.

3.05 SCHEDULE
   A. Refer to Door and Frame Schedule on the drawings.

END OF SECTION
SECTION 08 1416
FLUSH WOOD DOORS

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Flush wood doors; flush configuration; non-rated.

1.02 RELATED REQUIREMENTS
A. Section 08 1113 - Hollow Metal Doors and Frames.
B. Section 08 8000 - Glazing.
C. Section 09 2116 - Gypsum Board Assemblies: Bullet-resistant sheathing and wallboard for bullet-resistant partitions and walls.

1.03 REFERENCE STANDARDS
A. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards; 2014, with Errata (2016).

1.04 SUBMITTALS
A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Shop Drawings: Show doors and frames, elevations, sizes, types, swings, undercuts, beveling, blocking for hardware, factory machining, factory finishing, cutouts for glazing and other details.
   1. Provide information as required by AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS).

1.05 QUALITY ASSURANCE
A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section, with not less than three years of documented experience.
B. Installer Qualifications: Company specializing in performing work of the type specified in this section, with not less than three years of documented experience.

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.

PART 2 PRODUCTS

2.01 DOORS AND PANELS
A. Doors: Refer to drawings for locations and additional requirements.
   1. Quality Standard: Custom Grade, Standard Duty performance, in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), unless noted otherwise.
B. Interior Doors: 1-3/4 inches (44 mm) thick unless otherwise indicated; flush construction.
   1. Provide solid core doors at each location.

2.02 DOOR AND PANEL CORES
A. Non-Rated Solid Core and 20 Minute Rated Doors: Type particleboard core (PC), plies and faces as indicated.

2.03 DOOR FACINGS
A. Veneer Facing for Transparent Finish: Natural birch, veneer grade in accordance with quality standard indicated, plain sliced (flat cut), with book match between leaves of veneer, running match of spliced veneer leaves assembled on door or panel face.
2.04 DOOR CONSTRUCTION
   A. Fabricate doors in accordance with door quality standard specified.
   B. Cores Constructed with stiles and rails:
   C. Factory machine doors for hardware other than surface-mounted hardware, in accordance with
      hardware requirements and dimensions.
   D. Factory fit doors for frame opening dimensions identified on shop drawings, with edge
      clearances in accordance with specified quality standard.
   E. Provide edge clearances in accordance with the quality standard specified.

PART 3 EXECUTION

3.01 EXAMINATION
   A. Verify existing conditions before starting work.
   B. Verify that opening sizes and tolerances are acceptable.
   C. Do not install doors in frame openings that are not plumb or are out-of-tolerance for size or
      alignment.

3.02 INSTALLATION
   A. Install doors in accordance with manufacturer's instructions and specified quality standard.
   B. Use machine tools to cut or drill for hardware.
   C. Coordinate installation of doors with installation of frames and hardware.

3.03 ADJUSTING
   A. Adjust doors for smooth and balanced door movement.
   B. Adjust closers for full closure.

END OF SECTION
SECTION 08 3100
ACCESS DOORS AND PANELS

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Wall and ceiling access door and frame units.

1.02 SUBMITTALS
A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Shop Drawings: Indicate exact position of each access door and/or panel unit.

1.03 QUALITY ASSURANCE
A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

PART 2 PRODUCTS

2.01 ACCESS DOORS AND PANELS ASSEMBLIES
A. Wall-Mounted Units:
   1. Location: As indicated on drawings.
   3. Size: 12 inch by 12 inch (305 mm by 305 mm).
B. Ceiling-Mounted Units:
   1. Location: Provide per drawings and at all valve and mechanical system requiring regular access.
   3. Size - Lay-In Grid Ceilings: To match module of ceiling grid.
   4. Size - Other Ceilings: 12 inch by 12 inch (305 mm by 305 mm).
   5. Door/Panel: Hinged, standard duty, with tool-operated spring or cam lock and no handle.

2.02 CEILING-MOUNTED UNITS
A. Ceiling-Mounted Units: Factory fabricated door and frame, fully assembled units with corner joints welded, filled and ground flush; square and without rack or warp; coordinate requirements with type of installation assembly being used for each unit.
   1. Style: Exposed frame with door surface flush with frame surface.
   2. Door Style: Single thickness with rolled or turned in edges.
   3. Frames: 16 gage, 0.0598 inch (1.52 mm), minimum thickness.
   5. Primed and Factory Finish: Polyester powder coat; color as selected by Architect from manufacturer's standard colors.
   6. Hardware:
      a. Hinges for Non-Fire-Rated Units: Concealed, constant force closure spring type.

PART 3 EXECUTION

3.01 EXAMINATION
A. Verify that rough openings are correctly sized and located.
B. Begin installation only after substrates have been properly prepared, and if the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.02 PREPARATION
A. Clean surfaces thoroughly prior to proceeding with this work.
B. Prepare surfaces using methods recommended by manufacturer for applicable substrates in accordance with project conditions.

3.03 INSTALLATION
A. Install units in accordance with manufacturer's instructions.
B. Install frames plumb and level in openings, and secure units rigidly in place.
C. Position units to provide convenient access to concealed equipment when necessary.

END OF SECTION
PART 1 GENERAL

1.01 SECTION INCLUDES
   A. Factory fabricated sliding glazed doors with frames and operating hardware.

1.02 RELATED REQUIREMENTS
   A. Section 08 7100 - Door Hardware: Cylinder locks.

1.03 REFERENCE STANDARDS
   G. ASTM E413 - Classification for Rating Sound Insulation; 2016.

1.04 SUBMITTALS
   A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
   B. Product Data: Provide component dimensions.
   C. Shop Drawings: Indicate opening dimensions, elevations of different types, and framed opening tolerances.
   D. Certificate: Certify that sliding glass doors meet or exceed specified 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 work of type specified in this section, with at least three years of documented 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 (5 degrees C).
   B. Maintain this minimum temperature during and 24 hours after installation of sealants.
1.08 WARRANTY
   A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
   B. Correct defective Work within a five year period after Date of Substantial Completion.
   C. Provide 10 year manufacturer warranty against failure of glass seal on insulating glass units,
      including interpane dusting or misting. Include provision for replacement of failed units.
   D. Provide 10 year manufacturer warranty against excessive degradation of exterior finish. Include
      provision for replacement of units with excessive fading, chalking, or flaking.

PART 2 PRODUCTS
2.01 MANUFACTURERS
   A. Aluminum Sliding Doors:
      1. Basis of Design: Western Window Systems, Series 600, Multi-pocket Door;
         westernwindowsystems.com
      2. C.R. Laurence Company, Inc; U.S. Aluminum Series 3000 High Performance Exterior
         Sliding Door: www.crl-arch.com/#sle.
      3. Kawneer; kawneer.com
      4. EFCO; efccorp.com
      5. YKK; ykkap.com
      6. Substitutions: See Section 01 6000 - Product Requirements.

2.02 SLIDING GLASS DOORS
   A. Aluminum Sliding Doors: Extruded aluminum unit frame and operable panel frame, factory
      fabricated, factory glazed; complete with integral sloped sill/threshold, flashings, and anchorage
      devices.
      1. Configuration: One fixed panel and one horizontal sliding panel.
      2. Finish: Powder coat paint finish.
      4. Frame Depth: 6 inches (152 mm), minimum.
      5. Aluminum Members: Factory finished; screw lock corner construction; thermally broken.
      6. Drainage: Provide drainage to exterior for moisture entering joints and glazing spaces and
         for condensation occurring within frame construction.
      7. Glass Stops: Same material and color as frame, sloped for wash.
   B. Construction: Factory assemble door frame as one unit, including head jambs, and sill; factory
      assemble operating and fixed panels.
      1. Sizes: Allow for tolerances of rough framed openings, clearances, and shims around
         perimeter of assemblies.
      2. Joints and Connections: Flush, hairline width, and waterproof; accurately and rigidly joined
         corners.
      3. Sills: One piece, sloped to drain, with integral roller track.

2.03 COMPONENTS
   A. Door Product Type: SD - Sliding door, in accordance with AAMA/WDMA/CSA 101/I.S.2/A440.
   B. Glazing: Double glazed, clear, Low-E coated, argon gas filled, fully tempered, with glass
      thicknesses as recommended by manufacturer for specified wind conditions.
      1. Flat Glass: In accordance with ASTM C1036, Type 1 - Transparent Flat Glass, Quality-Q3
         (architectural glass).
      3. Outboard Lite: Class 1 - Clear Glass; ASTM C1036.
      4. Inboard Lite: Class 1 - Clear Glass; ASTM C1036.

2.04 PERFORMANCE REQUIREMENTS
   A. Comply with AAMA/WDMA/CSA 101/I.S.2/A440, Type SD requirements in accordance with the
      following:
      1. Performance Class (PC): AW.
B. Member Deflection: Limit member deflection to flexure limit of glass in any direction, with full recovery of glazing materials.
C. Forced Entry Resistance (FER): Tested to comply with ASTM F842 requirements having at least Grade 30 performance for each required sliding door assembly.

2.05 ASSEMBLY
A. Factory assemble door frame as one unit, including head jambs, and sill; factory assemble operating and fixed panels.
B. Sizes: Allow for tolerances of rough framed openings, clearances, and shims around perimeter of assemblies.
C. Joints and Connections: Flush, hairline width, and waterproof; accurately and rigidly joined corners.
D. Sills: One piece, sloped to drain, with integral roller track.

2.06 FINISHES
A. Class I Natural Anodized Finish: AAMA 611 AA-M12C22A41 clear anodic coating not less than 0.7 mils (0.018 mm) thick.
B. Color: To be selected by Architect from manufacturer's standard range.
C. Touch-Up Materials: As recommended by coating manufacturer for field application.

2.07 ACCESSORIES
A. Pull Handles: Manufacturer’s standard type.
   1. Color: As selected by Architect from manufacturer's standard range.
   2. Include integral locking mechanism.
B. Sliding Panel Bottom Rollers: Stainless steel, adjustable from interior.
C. Limit Stops: Resilient rubber.
D. Cylinder Locks: Specified in Section 08 7100.
E. Anchors: Hot-dipped galvanized or stainless steel.
F. Bituminous Paint: Fibered asphaltic type.

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 sliding glass door units 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. Place threshold in bed of sealant.
E. Install operating hardware.
F. Install perimeter trim.
3.04 TOLERANCES
   A. Maintain dimensional tolerances and alignment with adjacent work.
   B. Maximum Variation from Plumb: 1/16 inch (1.6 mm).
   C. Maximum Variation from Level: 1/16 inch (1.6 mm).
   D. Longitudinal or Diagonal Warp: Plus or minus 1/8 inch (3.2 mm) from 10 foot (3 m) 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 sliding glass door manufacturer; rinse and wipe surfaces clean.

3.07 PROTECTION
   A. Protect installed products from damage during subsequent construction activities.

END OF SECTION
SECTION 08 4313
ALUMINUM-FRAMED STOREFRONTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Aluminum-framed storefront, with vision glass.
B. Aluminum doors and frames.
C. Weatherstripping.
D. Door hardware.

1.02 RELATED REQUIREMENTS

A. Section 08 8000 - Glazing: Glass and glazing accessories.

1.03 REFERENCE STANDARDS

A. AAMA CW-10 - Care and Handling of Architectural Aluminum From Shop to Site; 2015.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide component dimensions, describe components within assembly, anchorage and fasteners, glass and infill, door hardware, and internal drainage details.
C. Shop Drawings: Indicate system dimensions, framed opening requirements and tolerances, affected related work, expansion and contraction joint location and details, and field welding required.
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.

1.05 QUALITY ASSURANCE

A. Designer Qualifications: Design structural support framing components under direct supervision of a Professional Structural Engineer experienced in design of this Work and licensed in Utah.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Handle products of this section in accordance with AAMA CW-10.
B. Protect finished aluminum surfaces with wrapping. Do not use adhesive papers or sprayed coatings that bond to aluminum when exposed to sunlight or weather.

1.07 FIELD CONDITIONS

A. Do not install sealants when ambient temperature is less than 40 degrees F (5 degrees C). Maintain this minimum temperature during and 48 hours after installation.
1.08 WARRANTY
A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
B. Correct defective Work within a five year period after Date of Substantial Completion.
C. Provide five year manufacturer warranty against failure of glass seal on insulating glass units, including interpane dusting or misting. Include provision for replacement of failed units.
D. Provide five year manufacturer warranty against excessive degradation of exterior finish. Include provision for replacement of units with excessive fading, chalking, or flaking.

PART 2 PRODUCTS
2.01 MANUFACTURERS
A. Other Acceptable - Aluminum-Framed Storefronts Manufacturers:
   4. Substitutions: See Section 01 6000 - Product Requirements.

2.02 BASIS OF DESIGN -- FRAMING FOR INSULATING GLAZING
A. Center-Set Style, Wind-Borne-Debris Resistance Tested:
   1. Vertical Mullion Dimensions: 2 inches wide by 4-1/2 inches deep (50 mm wide by 114 mm deep).

2.03 BASIS OF DESIGN -- FRAMING FOR MONOLITHIC GLAZING
A. Center-Set Style, Wind-Borne-Debris Resistance Tested:
   1. Vertical Mullion Dimensions: 2 inches wide by 4-1/2 inches deep (51 mm wide by 114 mm deep).

2.04 BASIS OF DESIGN -- SWINGING DOORS
A. Wind-Borne-Debris Resistance Tested:
   1. Thickness: 1-3/4 inches (43 mm).
B. Medium Stile, Monolithic Glazing:
   1. Thickness: 1-3/4 inches (43 mm).
C. Medium Stile, Insulating Glazing, Thermally-Broken:
   1. Thickness: 1-3/4 inches (43 mm).

2.05 MANUFACTURERS
A. Aluminum-Framed Storefront and Doors:
   5. YKK AP America Inc:  www.ykkap.com/#sle.

2.06 STOREFRONT
A. Aluminum-Framed Storefront: Factory fabricated, factory finished aluminum framing members with infill, and related flashings, anchorage and attachment devices.
   2. Finish: Superior performing organic coatings.
      a. Factory finish all surfaces that will be exposed in completed assemblies.
      b. Touch-up surfaces cut during fabrication so that no natural aluminum is visible in completed assemblies, including joint edges.
   3. Finish Color: As selected by Architect from manufacturer’s standard line.
   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.
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 (95 degrees C) 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. Wind-Borne-Debris Resistance: Identical full-size glazed assembly without auxiliary protection, having Florida Building Code "FLA (PAD)" approval for Large and Small Missile impact and pressure cycling at design wind pressure.
3. Water Penetration Resistance on Manufactured Assembly: No uncontrolled water on interior face, when tested in accordance with ASTM E331 at pressure differential of 8 psf (390 Pa).
4. Air Leakage Laboratory Test: Maximum of 0.06 cu ft/min sq ft (0.3 L/sec sq m) of wall area, when tested in accordance with ASTM E283 at 6.27 psf (300 Pa) pressure differential across assembly.

2.07 COMPONENTS
A. Aluminum Framing Members: Tubular aluminum sections, thermally broken with interior section insulated from exterior, drainage holes and internal weep drainage system.
   2. Structurally Reinforced Members: Extruded aluminum with internal reinforcement of structural steel member.
B. Glazing: As specified in Section 08 8000.
C. Swing Doors: Glazed aluminum.
   1. Thickness: 1-3/4 inches (43 mm).
   2. Top Rail: 4 inches (100 mm) wide.
   3. Vertical Stiles: 4-1/2 inches (115 mm) wide.
   4. Bottom Rail: 10 inches (254 mm) wide.
   5. Glazing Stops: Square.
   6. Finish: Same as storefront.

2.08 MATERIALS
B. Fasteners: Stainless steel.
C. Glazing Gaskets: Type to suit application to achieve weather, moisture, and air infiltration requirements.

2.09 HARDWARE
A. For each door, include weatherstripping, sill sweep strip, and threshold.
B. Weatherstripping: Wool pile, continuous and replaceable; provide on all doors.
C. Sill Sweep Strips: Resilient seal type, retracting, of neoprene; provide on all doors.
D. Threshold: Extruded aluminum, one piece per door opening, ribbed surface; provide on all doors.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify dimensions, tolerances, and method of attachment with other work.
B. Verify that wall openings and adjoining air and vapor seal materials are ready to receive work of this section.

3.02 INSTALLATION

A. Install wall system in accordance with manufacturer's instructions.
B. Attach to structure to permit sufficient adjustment to accommodate construction tolerances and other irregularities.
C. Provide alignment attachments and shims to permanently fasten system to building structure.
D. Align assembly plumb and level, free of warp or twist. Maintain assembly dimensional tolerances, aligning with adjacent work.
E. Provide thermal isolation where components penetrate or disrupt building insulation.
F. Install sill flashings. Turn up ends and edges; seal to adjacent work to form water tight dam.
G. Where fasteners penetrate sill flashings, make watertight by seating and sealing fastener heads to sill flashing.
H. Pack fibrous insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.
I. Set thresholds in bed of sealant and secure.
J. Install hardware using templates provided.
K. Touch-up minor damage to factory applied finish; replace components that cannot be satisfactorily repaired.

3.03 TOLERANCES

A. Maximum Variation from Plumb: 0.06 inch per 3 feet (1.5 mm per m) non-cumulative or 0.06 inch per 10 feet (1.5 mm per 3 m), whichever is less.
B. Maximum Misalignment of Two Adjoining Members Abutting in Plane: 1/32 inch (0.8 mm).

3.04 ADJUSTING

A. Adjust operating hardware and sash for smooth operation.

3.05 CLEANING

A. Remove protective material from pre-finished aluminum surfaces.

3.06 PROTECTION

A. Protect installed products from damage until Date of Substantial Completion.

END OF SECTION
SECTION 08 71 00
DOOR HARDWARE

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Hardware for wood and hollow steel 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.
H. Mock-up, See General Requirements

1.02 RELATED REQUIREMENTS
A. Section 08 11 13 - Hollow Metal Doors and Frames.
B. Section 08 12 13 - Hollow Metal Frames.
C. Section 08 14 16 - Flush Wood Doors.
D. Section 28 31 05 - Fire Alarm System Equipment: Electrical connection to activate door closers.

1.03 REFERENCE STANDARDS
D. BHMA A156.1 - American National Standard for Butts and Hinges; Builders Hardware Manufacturers Association, Inc.; 2006 (ANSI/BHMA A156.1).
E. BHMA A156.2 - American National Standard for Bored and Preassembled Locks & Latches; Builders Hardware Manufacturers Association; 2011 (ANSI/BHMA A156.2).
F. BHMA A156.3 - American National Standard for Exit Devices; Builders Hardware Manufacturers Association; 2008 (ANSI/BHMA A156.3).
G. BHMA A156.4 - American National Standard for Door Controls - Closers; Builders Hardware Manufacturers Association, Inc.; 2008 (ANSI/BHMA A156.4).
H. BHMA A156.5 - Cylinders and Input Devices for Locks; Builders Hardware Manufacturers Association; 2010 (ANSI/BHMA A156.5).
I. BHMA A156.6 - American National Standard for Architectural Door Trim; Builders Hardware Manufacturers Association; 2010 (ANSI/BHMA A156.6).
J. BHMA A156.7 - American National Standard for Template Hinge Dimensions; Builders Hardware Manufacturers Association; 2003 (ANSI/BHMA A156.7).
K. BHMA A156.8 - American National Standard for Door Controls - Overhead Stops and Holders; Builders Hardware Manufacturers Association, Inc.; 2010 (ANSI/BHMA A156.8).
L. BHMA A156.9 - American National Standard for Cabinet Hardware; Builders Hardware Manufacturers Association; 2010 (ANSI/BHMA A156.9).
N. BHMA A156.16 - American National Standard for Auxiliary Hardware; Builders Hardware Manufacturers Association; 2008 (ANSI/BHMA A156.16).
P. BHMA A156.18 - American National Standard for Materials and Finishes; Builders Hardware Manufacturers Association, Inc.; 2012 (ANSI/BHMA A156.18).
Q. BHMA A156.21 - American National Standard for Thresholds; Builders Hardware Manufacturers Association; 2009 (ANSI/BHMA A156.21).
R. BHMA A156.22 - American National Standard for Door Gasketing and Edge Seal Systems, Builders Hardware Manufacturers Association; 2012 (ANSI/BHMA A156.22).
S. BHMA A156.115 - Hardware Preparation in Steel Doors and Steel Frames; 2006.
T. BHMA A156.115W - Hardware Preparation in Wood Doors with Wood or Steel Frames; 2006.
U. DHI (LOCS) - Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames; Door and Hardware Institute; 2004.
V. 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.

1.04 ADMINISTRATIVE REQUIREMENTS
A. Coordinate the manufacture, fabrication, and installation of products onto which door hardware will be installed.
B. Furnish templates for door and frame preparation to manufacturers and fabricators of products requiring internal reinforcement for door hardware.
C. Convey Owner's keying requirements to manufacturers.
D. Preinstallation Meeting: Convene a mandatory preinstallation meeting one week prior to commencing work of this section; require attendance by all affected installers.
E. Sequence installation to ensure utility connections are achieved in an orderly and expeditious manner.

1.05 SUBMITTALS
A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
B. Product Data: Manufacturer's catalog literature for each type of hardware, marked to clearly show products to be furnished for this project.
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.
   1. Submit manufacturer’s parts lists and templates.
   2. Bitting List: List of combinations as furnished.

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.

J. Maintenance Materials and Tools: Furnish the following for Owner's use in maintenance of project.
   1. See Section 01 60 00 - Product Requirements, for additional provisions.
   2. Tools: One set of all special wrenches or tools applicable to each different or special hardware component, whether supplied by the hardware component manufacturer or not.
   3. Upon completion of the project, provide one owner's manual consisting of a copy of the final hardware schedule with approved keying schedule, installation instructions, operating instructions, manufacturers addresses, maintenance data and any special tools required for the project hardware.

1.06 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years of documented experience.

B. Hardware Supplier Qualifications: Company specializing in supplying commercial door hardware with 5 years of experience.

C. 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.

B. Deliver hardware f.o.b. jobsite (street address) to contractors authorized agent to transfer legal possession. Furnish in manufacturers original packaging, clearly marked to correlate with the hardware schedule.

C. Contractor shall provide secure storage of ample space for all project hardware. Distribution of hardware shall be strictly controlled to prevent loss or damage. Required replacement of lost or damaged items will be the responsibility of the contractor.

1.08 WARRANTY

A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.

B. All hardware to be warranted against defects in materials and workmanship by the manufacturer for a period of two years from the date of occupancy. Provide extended warranty for following products:
   1. Locksets........................................10 years
   2. Mechanical panic devices .... 3 years
   3. Manual closers ................. 30 years
   4. Power operators ............ ... 2 years
PART 2 PRODUCTS

2.01 MANUFACTURERS
   A. Products of manufacturers are shown as No-Substitute products, Owner Standards.

2.02 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. ADA Standards for Accessible Design.
      6. All Hardware on Fire-Rated Doors: Listed and classified by UL as suitable for the purpose specified and indicated.
      7. Hardware for Smoke and Draft Control Doors (Indicated as "S" on Drawings): Provide hardware that enables door assembly to comply with air leakage requirements of the applicable code.
      8. 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 manufacturers series as listed in hardware schedule.
   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. Finishes: All door hardware the same finish unless otherwise indicated.
      1. Primary Finish: Satin chrome plated over nickel on brass or bronze, 626 (US26D).
      2. Secondary Finish: Or satin stainless steel (BHMA 630) as noted in the hardware sets.
      3. Finish Definitions: BHMA A156.18.
      4. Exceptions:
         a. Where base metal is specified to be different, provide finish that is an appearance equivalent according to BHMA A156.18 Plated.
         c. Door Closer Covers and Arms: Color as indicated in sets.
         d. Aluminum Surface Trim and Gasket Housings: Anodized to match door, not to match other hardware.
         e. Hardware for Aluminum Storefront Doors: Finished to match door, except hand contact surfaces to be satin stainless steel.
   H. Fasteners:
      2. Concrete and Masonry Substrates: Stainless steel machine screws and lead expansion shields.

2.03 HINGES
   A. Hinges: Provide hinges on every swinging door. Continuous geared hinges at aluminum openings.
      1. Provide five-knuckle full mortise butt hinges unless otherwise indicated.
2. Provide ball-bearing hinges at all doors having closers.
3. Provide hinges in the quantities indicated.
5. Provide non-removable pins on outswinging interior doors at all doors with a lockset.
6. Where electrified hardware is mounted in door leaf, provide power transfer.

B. Butt Hinges: Comply with BHMA A156.1 and A156.7; heavy weight, unless otherwise indicated.
   1. Provide hinge width required to clear surrounding trim.

C. Quantity of Hinges Per Door:
   1. Doors up to 60 inches High: Two hinges.
   2. Doors From 60 inches High up to 90 inches High: Three hinges.
   3. Doors 90 inches High up to 120 inches High: Four hinges.
   4. Doors over 120 inches High: One additional hinge per each additional 30 inches in height.
   5. Dutch Doors: Two hinges each leaf.

D. Manufacturers - Hinges: Butt
   1. Ives: www.allegion.com, Owner’s prior approval

2.03 CONTINUOUS HINGES
   1. Provide aluminum geared continuous hinges conforming to ANSI/BHMA A156.26, Grade 1
   2. Provide hinges in the quantities indicated.
   3. Provide hinges capable of supporting doors of 450 pounds at 1.5 million cycles.
   4. Where electrified hardware is mounted in door leaf, provide power transfer.
   5. Provide hinge width required to clear surrounding trim.

D. Manufacturers - Hinges: Geared
   1. Ives: www.allegion.com, Owner’s prior approval

2.04 LOCKS AND LATCHES
   A. Locks: Provide a lock for every door, unless specifically indicated as not requiring locking.
      1. Hardware Sets indicate locking functions required for each door.
      2. If no hardware set is indicated for a swinging door provide an office lockset.
      3. Trim: Provide lever handle or pull trim on outside of all locks unless specifically stated to have no outside trim.
      4. Lock Cylinders: Provide key access on outside of all locks unless specifically stated to have no locking or no outside trim. Best - Standard, No-Substitution.
         a. Final cores must be received by Owner before substantial completion. Delivery by registered service to Facilities Manager: LCSD. Owner to install final cores.
   B. Electrically Operated Locks: Fail secure unless otherwise indicated.
   C. Keying: Grand master keyed.
      1. Key to existing keying system.
      2. Supply keys in the following quantities:
         b. 6 ea Master keys.
         d. 3 ea change keys per lock.
      3. When providing keying information, comply with DHI Handbook "Keying systems and nomenclature".

2.05 Cores
   A. Cores shall be MEDECO to match existing type and keyway and shall be keyed as directed by owner.

2.06 CYLINDRICAL LOCKSETS
   A. Locking Functions: As defined in BHMA A156.2, and as follows: Vandlgard as indicated.
1. Passage: No locking, always free entry and exit.
3. Office: Grade 1, key not required to lock, thumbturn button.
4. Intruder Classroom: key required to lock.
5. Storeroom Always-Locked: key required to lock, may not be left unlocked.

B. Manufacturers - Cylindrical Locksets: Schlage ND series, Corbin-Russwin Intruder, or Marks 95 Survivor Series

2.07 FLUSHBOLTS
A. Flushbolts: Lever extension bolts in leading edge of door, one bolt into floor, one bolt into top of frame.
   1. Pairs of Swing Doors: At inactive leaves, provide flush bolts of type as required to comply with code.
   2. Floor Bolts: Provide dustproof strike except at metal thresholds.
B. Manual Flushbolts: Provide lever extensions for top bolt at over-size doors.
D. Automatic Flushbolts: Automatically latch upon closing of door; automatic retraction of bolts when active leaf is opened.
E. Coordinators: Provide on doors having closers and self-latching or automatic flushbolts to ensure that leaves close in proper order.
F. Manufacturers - Flushbolts:
   1. Ives: www.allegion.com, Owner’s prior approval.

2.08 EXIT DEVICES
A. Locking Functions: Functions as defined in BHMA A156.3, and as follows:
   1. Entry/Exit, Always-Unlocked: Outside lever unlocked, no outside key access, no latch holdback.
   2. Entry/Exit, Free Swing: Key outside retracts latch, latch holdback (dogging) for free swing during occupied hours, not fire-rated; outside trim must be specified as lever or pull.
   3. Entry/Exit, Always-Latched: Key outside locks and unlocks lever, no latch holdback (dogging).
   4. Entry/Exit, Always-Locked: Key outside retracts latchbolt but does not unlock lever, no latch holdback.
   5. Exit Only, Secure: No outside trim, no key entry, no latch holdback, deadlocking latchbolt.
B. Manufacturers: Von Duprin 98 series or Corbin-Russwin ED8000 series

2.09 CLOSERS
A. Closers: Complying with BHMA A156.4.
   1. Provide surface-mounted, door-mounted closers unless otherwise indicated.
   2. Provide through bolts on every door, Mandatory by Owner Standards.
   3. Provide a door closer on every fire- and smoke-rated door. Spring hinges are not an acceptable self-closing device unless specifically so indicated.
   4. On pairs of swinging doors, if an overlapping astragal is present, provide coordinator to ensure the leaves close in proper order. No cutting of astragal for strikes allowed per Owner requirements.
   5. At corridors, locate door-mounted closer on room side of door.
   6. At outswinging exterior doors, mount closer in inside of door.
B. Manufacturers - Closers: 4040XP
   1. LCN: www.allegion.com, No substitutions – owner’s standard
2.10 AUTO OPERATORS

A. Closers: Complying with BHMA A156.19

1. Provide low energy automatic operator units with hydraulic closer complying with ANSI/BHMA A156.19.
2. Hydraulic Fluid: Fireproof, passing requirements of UL10C, and requiring no seasonal closer adjustment for temperatures ranging from 120 degrees F to -30 degrees F.
3. Provide units with conventional door closer opening and closing forces unless power operator motor is activated. Provide door closer assembly with adjustable spring size, back-check, and opening and closing speed adjustment valves to control door.
4. Provide units with on/off switch for manual operation, motor start up delay, vestibule interface delay, electric lock delay, and door hold open delay.
5. Provide units with conventional door closer opening and closing forces unless power operator motor is activated. Provide door closer assembly with adjustable spring size, back-check valve, sweep valve, latch valve to control door.
6. Provide drop plates, brackets, or adapters for arms as required for details.
7. Provide hard-wired actuator switches for operation as specified.
8. Provide weather-resistant actuators at exterior applications.
9. Provide key switches with LED’s, recommended and approved by manufacturer of automatic operator as required for function described in operation description of hardware group below. Cylinders: Refer to “KEYING” article, herein.
10. Provide complete assemblies of controls, switches, power supplies, relays, and parts/material recommended and approved by manufacturer of automatic operator for each individual leaf. Actuators control both doors simultaneously at pairs. Sequence operation of exterior and vestibule doors with automatic operators to allow ingress or egress through both sets of openings as directed by Architect. Locate actuators, key switches, and other controls as directed by Architect.
11. Provide units with vestibule inputs that allow sequencing operation of two units, and SPDT relay for interfacing with latching or locking devices.

B. Manufacturers – Auto Operators – LCN 4600 series


2.11 STOPS AND HOLDERS

A. Stops: Complying with BHMA A156.8; provide a stop for every swinging door, unless otherwise indicated.

1. Provide wall stops, unless otherwise indicated.
2. If wall stops are not practical, due to configuration of room or furnishings, provide overhead stop.
3. Stop is not required if positive stop feature is specified for door closer; positive stop feature of door closer is not an acceptable substitute for a stop unless specifically so stated.

B. Wall Stops:

C. Floor Stops:

D. Overhead Holders/Stops:

E. Manufacturers - Overhead Holders/Stops:


F. Manufacturers - Wall and Floor Stops/Holders:

2.12 GASKETING AND_THRESHOLDS

A. Gaskets: Complying with BHMA A156.22.
1. On each door in smoke partition, provide smoke gaskets; top, sides, and meeting stile of pairs. If fire/smoke partitions are not indicated on drawings, provide smoke gaskets on each door identified as a "smoke door" and 20-minute rated fire doors.
2. On wood doors with fire rating more than 20-minutes, provide frame-applied intumescent gaskets.
3. On each exterior door, provide weatherstripping gaskets, unless otherwise indicated; top, sides, and meeting stiles of pairs.
   a. Where exterior door is also required to have fire or smoke rating, provide gaskets functioning as both smoke and weather seals.
4. On each exterior door, provide door bottom sweep, unless otherwise indicated.
5. On doors indicated as "sound-rated", "acoustical", or with an STC rating, provide sound-rated gaskets and automatic door bottom; make gaskets completely continuous, do not cut or notch gaskets for installation.
6. On doors indicated as "lightproof", provide gaskets similar to smoke gaskets.
7. Drip Guard: Provide projecting drip guard over all exterior doors unless they are under a projecting roof or canopy.

B. Thresholds:
1. At each exterior door, provide a threshold unless otherwise indicated.
2. Field cut threshold to frame for tight fit. Sealant as indicated by Architect.

C. Fasteners At Exterior Locations: Non-corroding.

D. Manufacturers - Gasketing and Thresholds:

2.13 PROTECTION PLATES AND ARCHITECTURAL TRIM

A. Protection Plates:
1. Kickplate: Provide on push side of every door as scheduled.
2. Armor Plates: Provide on push side of every door as scheduled.

B. Manufacturers - Protection Plates and Architectural Trim:

2.14 KEY CONTROLS

A. Key Management System: For each keyed lock on project, provide one set of consecutively numbered duplicate key tags with hanging hole and snap catch. 150% expandable.
1. Security Key Tags: For each keyed lock on project, provide one set of matching key tags for permanent attachment to one key of each set.
2. Provide key collection envelopes, receipt cards, and index cards in quantity suitable to number of keys to be managed.

B. Fire Department Lock Box: Heavy-duty, recessed mounted, solid stainless-steel box with hinged door and interior gasket seal; single drill resistant lock with dust covers and tamper alarm.
2. Finish: Manufacturer's standard dark bronze.
3. Products:
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. Do not install surface mounted items until finishes applied to substrate are complete.
   D. Install hardware on fire-rated doors and frames in accordance with code and NFPA 80.
   E. Mounting heights for hardware from finished floor to center line of hardware item: as listed here. Match Existing
       1. For steel doors and frames: Comply with DHI "Recommended Locations for Architectural Hardware for Steel Doors and Frames." and in compliance with the American Disabilitiers Act (ADA).
       2. For steel doors and frames: See Section 08 11 13.
       3. For wood doors: Comply with DHI "Recommended Locations for Architectural Hardware for Wood Flush Doors."
       4. Wood doors: See Section 08 14 16.

3.03 FIELD QUALITY CONTROL
   A. Field inspection and testing will be performed under provisions of Section 01 40 00.
   B. 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.
   C. Adjust gasketing for complete, continuous seal; replace if unable to make complete seal.

3.05 CLEANING
   A. Clean adjacent surfaces soiled by hardware installation. Clean finished hardware per manufacturer's instructions after final adjustments has been made. Replace items that cannot be cleaned to manufacturer's level of finish quality at no additional cost.

3.06 PROTECTION
   A. Protect finished Work under provisions of Section 01 70 00.
   B. Do not permit adjacent work to damage hardware or finish.

3.07 SCHEDULE OF FINISH HARDWARE
   A. Refer to Drawings for schedule of Door Hardware.
**GENERAL NOTE(S):**

1. On doors with glass lites with exit devices, if required, use the GBK option.
2. Provide through bolts (SNB/TB) on all door closers.

✓ = Hardware Item Requiring Electrical Coordination

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1 EA VANDL OFFICE LOCK ND91BD SPA 605 SCH
1 EA FURNISHED AND PINNED THROUGH GC MEDECO SFIC 626 SCH
1 EA WALL STOP WS406/407CCV 630 IVE
3 EA SILENCER SR64 GRY IVE

HARDWARE GROUP NO. 12
Each to have:
3 EA HINGE 5BB1 4.5 X 4.5 652 IVE
1 EA VANDL OFFICE LOCK ND91BD SPA 605 SCH
1 EA FURNISHED AND PINNED THROUGH GC MEDECO SFIC 626 SCH
1 EA OH STOP 450S J 630 GLY
3 EA SILENCER SR64 GRY IVE

HARDWARE GROUP NO. 13
Each to have:
3 EA HINGE 5BB1 4.5 X 4.5 652 IVE
1 EA PASSAGE SET ND10S SPA 605 SCH
1 EA SURFACE CLOSER 4040XP 689 LCN
1 EA KICK PLATE 8400 10" X 2" LDW B-CS 630 IVE
1 EA WALL STOP WS406/407CCV 630 IVE
3 EA SILENCER SR64 GRY IVE

HARDWARE GROUP NO. 14
Each to have:
3 EA HINGE 5BB1 4.5 X 4.5 652 IVE
1 EA PRIVACY W/DEADBOLT L9440 17A L583-363 L283-722 605 SCH
1 EA WALL STOP WS406/407CVX 630 IVE
1 EA GASKETING 188SBK PSA BK ZER

HARDWARE GROUP NO. 15
Each to have:
3 EA HINGE 5BB1 4.5 X 4.5 NRP 652 IVE
1 EA PRIVACY W/DEADBOLT L9440 17A L583-363 L283-722 605 SCH
1 EA OH STOP 450S 630 GLY
1 EA GASKETING 188SBK PSA BK ZER
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### HARDWARE GROUP NO. AL-06

Each to have:

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| 1 | EA | SFIC MORTISE CYL. | 80-105 (CAM AS REQ'D) | 626 | SCH |
| 1 | EA | SFIC RIM HOUSING | 80-129 | 626 | SCH |
| 1 | EA | DOOR PULL | VR910 NL | 630 | IVE |
| 1 | EA | OH STOP | 100S ADJ | 630 | GLY |
| 1 | EA | SURFACE CLOSER | 4040XP SCUSH | 689 | LCN |
| 1 | EA | WEATHER STRIPPING | BY ALUMINUM DOOR MANUFACTURER | | |
| 1 | EA | MULTITECH READER | MT15 | BLK | SCE |
| 1 | EA | POWER SUPPLY | PS902 BBK 900-2RS | LGR | SCE |

### HARDWARE GROUP NO. AL-07

Each to have:

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| 1 | EA | SURFACE CLOSER | 4040XP SCUSH | 689 | LCN |
| 1 | EA | WALL STOP | WS406/407CVX | 630 | IVE |
| 1 | EA | WEATHER STRIPPING | BY ALUMINUM DOOR MANUFACTURER | | |
| 1 | EA | DOOR SWEEP | 39A | A | ZER |
| 1 | EA | THRESHOLD | 565A-223 | A | ZER |

### HARDWARE GROUP NO. AL-08

Each to have:

| 1 | EA | CONT. HINGE | 112HD | 313AN | IVE |
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| 1 | EA | SURFACE CLOSER | 4040XP EDA | 689 | LCN |
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| 1 | EA | MULTITECH READER | MT15 | BLK | SCE |
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PUSH BUTTON FOR REMOTE UNLOCKING

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PUSH BUTTON FOR REMOTE UNLOCKING

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## HARDWARE GROUP NO. RU-01

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ELLIS ELEMENTARY 08 7100 - 19 DOOR HARDWARE
SECTION 08 8000
GLAZING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Insulating glass units.
B. Glazing units.
C. Glazing compounds and accessories.

1.02 RELATED REQUIREMENTS

A. Section 07 9200 - Joint Sealants: Sealants for other than glazing purposes.
B. Section 08 1113 - Hollow Metal Doors and Frames: Glazed lites in doors and borrowed lites.
C. Section 08 1416 - Flush Wood Doors: Glazed lites in doors.
D. Section 08 3200 - Sliding Glass Doors: Glazing furnished by door manufacturer.
E. Section 08 3613 - Sectional Doors: Glazed lites in doors.
F. Section 08 4126 - All-Glass Entrances and Storefronts: Glazing furnished as part of entrance assembly.
G. Section 08 4229 - Automatic Entrances: Glazing furnished as part of door assembly.
H. Section 08 4313 - Aluminum-Framed Storefronts: Glazing furnished as part of storefront assembly.
I. Section 08 4413 - Aluminum Window Walls: Glazing furnished as part of wall assembly.
J. Section 08 5113 - Aluminum Windows: Glazing furnished by window manufacturer.
K. Section 10 2800 - Toilet, Bath, and Laundry Accessories: Mirrors.

1.03 REFERENCE STANDARDS


1.04 ADMINISTRATIVE REQUIREMENTS
A. Preinstallation Meeting: Convene a preinstallation meeting one week before starting work of this section; require attendance by each of the affected installers.

1.05 SUBMITTALS
A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Product Data on Insulating Glass Unit, Glazing Unit, Plastic Film, and Spandrel Glazing Types: Provide structural, physical and environmental characteristics, size limitations, special handling and installation requirements.
C. Product Data on Glazing Compounds and Accessories: Provide chemical, functional, and environmental characteristics, limitations, special application requirements, and identify available colors.
D. Samples: Submit two samples 12 by 12 inch (___ by ___ mm) in size of glass units, showing coloration.
E. Certificate: Certify that products of this section meet or exceed specified requirements.
F. Warranty Documentation: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

1.06 QUALITY ASSURANCE
A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years of documented experience.
B. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years documented experience.

1.07 FIELD CONDITIONS
A. Do not install glazing when ambient temperature is less than 40 degrees F (4 degrees C).

1.08 WARRANTY
A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
B. Insulating Glass Units: Provide a five (5) year manufacturer warranty to include coverage for seal failure, interpane dusting or misting, including providing products to replace failed units.

PART 2 PRODUCTS
2.01 MANUFACTURERS
A. Glass Fabricators:
   3. Substitutions: Refer to Section 01 6000 - Product Requirements.
B. Float Glass Manufacturers:
   1. AGC Glass North America, Inc; _____: www.agcglass.com/#sle.
   5. Substitutions: Refer to Section 01 6000 - Product Requirements.
C. Mirrored Glass Manufacturers:
   2. Substitutions: Refer to Section 01 6000 - Product Requirements.
D. Plastic Films Manufacturers:
   1. 3M Window Film: solutions.3m.com/wps/portal/3M/en_US/Window_Film/Solutions/#sle.
   3. Llumar, an Eastman Chemical Company; Llumar or Vista: www.llumar.com/#sle.
   4. Substitutions: Refer to Section 01 6000 - Product Requirements.

2.02 PERFORMANCE REQUIREMENTS - EXTERIOR GLAZING ASSEMBLIES

A. Provide type and thickness of exterior glazing assemblies to support assembly dead loads, and to withstand live loads caused by positive and negative wind pressure acting normal to plane of glass.
   1. Design Pressure: Calculated in accordance with ASCE 7.
   2. Comply with ASTM E1300 for design load resistance of glass type, thickness, dimensions, and maximum lateral deflection of supported glass.
   3. Seismic Loads: Design and size glazing components to withstand seismic loads and sway displacement in accordance with the requirements of ASCE 7.
   4. Provide glass edge support system sufficiently stiff to limit the lateral deflection of supported glass edges to less than 1/175 of their lengths under specified design load.
   5. Glass thicknesses listed are minimum.

B. Vapor Retarder and Air Barrier Seals: Provide completed assemblies that maintain continuity of building enclosure vapor retarder and air barrier.
   1. In conjunction with vapor retarder and joint sealer materials described in other sections.
   2. To maintain a continuous vapor retarder and air barrier throughout the glazed assembly from glass pane to heel bead of glazing sealant.

C. Thermal and Optical Performance: Provide exterior glazing products with performance properties as indicated. Performance properties are in accordance with manufacturer's published data as determined with the following procedures and/or test methods:
   1. Center of Glass U-Value: Comply with NFRC 100 using Lawrence Berkeley National Laboratory (LBNL) WINDOW 6.3 computer program.
   2. Center of Glass Solar Heat Gain Coefficient (SHGC): Comply with NFRC 200 using Lawrence Berkeley National Laboratory (LBNL) WINDOW 6.3 computer program.

2.03 GLASS MATERIALS

A. Float Glass: Provide float glass based glazing unless otherwise indicated.
   1. Annealed Type: ASTM C1036, Type I - Transparent Flat, Class 1 - Clear, Quality - Q3.
   3. Fully Tempered Safety Glass: Complies with ANSI Z97.1 or 16 CFR 1201 criteria for safety glazing used in hazardous locations.
   4. Thicknesses: As indicated; provide greater thickness as required for exterior glazing wind load design.

2.04 INSULATING GLASS UNITS

A. Manufacturers:
   1. Any of the manufacturers specified for float glass.
   2. Fabricator certified by glass manufacturer for type of glass, coating, and treatment involved and capable of providing specified warranty.

B. Insulating Glass Units: Types as indicated.
   1. Durability: Certified by an independent testing agency to comply with ASTM E2190.
   2. Coated Glass: Comply with requirements of ASTM C1376 for pyrolytic (hard-coat) or magnetic sputter vapor deposition (soft-coat) type coatings on flat glass; coated vision glass, Kind CV; coated overhead glass, Kind CO; or coated spandrel glass, Kind CS.
   3. Metal Edge Spacers: Aluminum, bent and soldered corners.
   5. Edge Seal:
a. Dual-Sealed System: Provide polyisobutylene sealant as primary seal applied between spacer and glass panes, and silicone, polysulfide, or polyurethane sealant as secondary seal applied around perimeter.

7. Purge interpane space with dry air, hermetically sealed.
8. Capillary Tubes: Provide tubes from air space for insulating glass units without inert type gas that have a change of altitude greater than 2500 feet (762 m) between point of fabrication and point of installation to permit pressure equalization of air space.
   a. Breather Tubes: Seal or crimp breather tubes upon installation in accordance with insulating glass fabricator's requirements.
   b. Inert gas may be installed in the field into air space in accordance with insulating glass fabricator's and installer's requirements.

C. Insulating Glass Units: Vision glass, double glazed.
1. Applications: Exterior glazing unless otherwise indicated.
2. Space between lites filled with air.
3. Outboard Lite: Annealed float glass, 1/4 inch (6.4 mm) thick, minimum.
   a. Tint: Clear.
   b. Coating: Self-cleaning type, on #1 surface.
   c. Coating: Low-E (passive type), on #2 surface.
4. Inboard Lite: Annealed float glass, 1/4 inch (6.4 mm) thick, minimum.
   a. Tint: Clear.
5. Total Thickness: 1 inch (25.4 mm).
6. Thermal Transmittance (U-Value), Summer - Center of Glass: .26, nominal.
7. Visible Light Transmittance (VLT): 32% to 64% percent, nominal.
8. Solar Heat Gain Coefficient (SHGC): 0.19 to 0.27, nominal.

D. Insulating Glass Units: Safety glazing.
1. Applications:
   a. Glazed lites in exterior doors.
   b. Glazed sidelights and panels next to doors.
   c. Other locations required by applicable federal, state, and local codes and regulations.
   d. Other locations indicated on drawings.
2. Space between lites filled with air.
3. Glass Type: Same as Type IG-1 except use fully tempered float glass for both outboard and inboard lites.
4. Tint: Clear.
5. Total Thickness: 1 inch (25.4 mm).
6. Thermal Transmittance (U-Value), Summer - Center of Glass: .26, nominal.
7. Visible Light Transmittance (VLT): 32% to 64% percent, nominal.
8. Solar Heat Gain Coefficient (SHGC): 0.19 to 0.27, nominal.

2.05 BASIS OF DESIGN - INSULATING GLASS UNITS

A. Basis of Design - Insulating Glass Units: Vision glazing, with Low-E coating.
1. Applications: Exterior insulating glass glazing unless otherwise indicated.
2. Space between lites filled with air.
3. Total Thickness: 1 inch (25.4 mm).
4. Thermal Transmittance (U-Value), Summer - Center of Glass: .26, nominal.
5. Visible Light Transmittance (VLT): 32% to 64% percent, nominal.
6. Solar Heat Gain Coefficient (SHGC): 0.19 to 0.27, nominal.
7. Visible Light Reflectance, Outside: 64 percent, nominal.
9. Edge Seal:
11. Purge interpane space with dry air, hermetically sealed.
13. Outboard Lite: Annealed float glass, 1/4 inch (6.4 mm) thick, minimum.
   a. Low-E Coating: Vitro Architectural Glass (formerly PPG Glass) Solarban 70XL on #2 surface.
   b. Glass: Clear.
15. Other Manufacturers: Provide either the product identified as "Basis of Design" or an equivalent product of another acceptable manufacturer.

2.06 GLAZING UNITS

A. Monolithic Exterior Vision Glazing:
   1. Applications: As scheduled.
   2. Glass Type: Annealed float glass.
   3. Tint: Clear.
   4. Thickness: 1/4 inch (6.4 mm), nominal.

B. Monolithic Interior Vision Glazing:
   1. Applications: Interior glazing unless otherwise indicated.
   2. Glass Type: Annealed float glass.
   3. Tint: Clear.
   4. Thickness: 1/4 inch (6.4 mm), nominal.
   5. Butt-glazing (no interior mullions allowed):
      a. Thickness:
         1) 1/4" tempered for heights up to 5'-0"
         2) 3/8" tempered for heights over 5'-0" up to 8'-0"
         3) 1/2" tempered for heights over 8'-0" up to 10'-0"
         4) 5/8" tempered for heights over 10'-0" up to 12'-0"
         5) 3/4" tempered for heights over 12'-0" up to 14'-0"
         6) 7/8" tempered for heights over 14'-0" up to 16'-0"
         7) 1" tempered for heights over 16'-0" up to 18'-0"
      b. Provide engineering data with submittals for all butt glazed window units

C. Type G-14 - Direct to Glass Ceramic Printing: Ceramic frit is fused into glass creating permanent designs.
   1. Applications: Locations as indicated on drawings.
   2. Glass Type: Fully tempered; monolithic glass system.

2.07 GLAZING COMPOUNDS

A. Type GC-2 - Butyl Sealant: Single component; ASTM C920, Grade NS, Class 12-1/2, Uses M and A, Shore A hardness of 10 to 20; black color.

B. Type GC-5 - 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.

C. Manufacturers:

2.08 ACCESSORIES

A. Setting Blocks: Silicone, with 80 to 90 Shore A durometer hardness; ASTM C864 Option II.
   Length of 0.1 inch for each square foot (25 mm for each square meter) of glazing or minimum 4
inch (100 mm) by width of glazing rabbet space minus 1/16 inch (1.5 mm) by height to suit glazing method and pane weight and area.

B. Spacer Shims: Neoprene, 50 to 60 Shore A durometer hardness; ASTM C864 Option II. Continuous by one half the height of the glazing stop by thickness to suit application, self adhesive on one face.

C. Glazing Tape, Back Bedding Mastic Type: Preformed, butyl-based, 100 percent solids compound with integral resilient spacer rod applicable to application indicated; 5 to 30 cured Shore A durometer hardness; coiled on release paper; black color.
   1. Width: As required for application.
   2. Thickness: As required for application.

D. Glazing Splines: Resilient silicone extruded shape to suit glazing channel retaining slot; ASTM C864 Option II; color black.

E. Glazing Clips: Manufacturer's standard type.

PART 3 EXECUTION

3.01 VERIFICATION OF CONDITIONS
A. Verify that openings for glazing are correctly sized and within tolerances, including those for size, squareness, and offsets at corners.
B. Verify that surfaces of glazing channels or recesses are clean, free of obstructions that may impede moisture movement, weeps are clear, and support framing is ready to receive glazing system.
C. Verify that sealing between joints of glass framing members has been completed effectively.

3.02 PREPARATION
A. Clean contact surfaces with appropriate solvent and wipe dry within maximum of 24 hours before glazing. Remove coatings that are not tightly bonded to substrates.
B. Seal porous glazing channels or recesses with substrate compatible primer or sealer.
C. Prime surfaces scheduled to receive sealant where required for proper sealant adhesion.

3.03 INSTALLATION, GENERAL
A. Install glazing in compliance with written instructions of glass, gaskets, and other glazing material manufacturers, unless more stringent requirements are indicated, including those in glazing referenced standards.
B. Install glazing sealants in accordance with ASTM C1193, GANA (SM), and manufacturer's instructions.
C. Set glass lites in proper orientation so that coatings face exterior or interior as indicated.
D. Prevent glass from contact with any contaminating substances that may be the result of construction operations such as, and not limited to the following; weld splatter, fire-safing, plastering, mortar dropings, etc.

3.04 INSTALLATION - DRY GLAZING METHOD (GASKET GLAZING)
A. Application - Exterior and/or Interior Glazed: Set glazing infills from either the exterior or the interior of the building.
B. Place setting blocks at 1/4 points with edge block no more than 6 inch (152 mm) from corners.
C. Rest glazing on setting blocks and push against fixed stop with sufficient pressure on gasket to attain full contact.
D. Install removable stops without displacing glazing gasket; exert pressure for full continuous contact.

3.05 INSTALLATION - WET GLAZING METHOD (SEALANT AND SEALANT)
A. Application - Exterior Glazed: Set glazing infills from the exterior of the building.
B. Place setting blocks at 1/4 points and install glazing pane or unit.
C. Install removable stops with glazing centered in space by inserting spacer shims both sides at 24 inch (610 mm) intervals, 1/4 inch (6.4 mm) below sight line.
D. Fill gaps between glazing and stops with ________ type sealant to depth of bite on glazing, but not more than 3/8 inch (9 mm) below sight line to ensure full contact with glazing and continue the air and vapor seal.
E. Apply sealant to uniform line, flush with sight line. Tool or wipe sealant surface smooth.

3.06 INSTALLATION - BUTT JOINT GLAZING METHOD (SEALANT ONLY)
A. Application - Exterior Glazed: Set glazing infills from exterior side of building.
B. 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.
C. Temporarily secure a small diameter non-adhering foamed rod on back side of joint.
D. Apply sealant to open side of joint in continuous operation; thoroughly fill joint without displacing foam rod, and then tool sealant surface smooth to concave profile.
E. Permit sealant to cure then remove foam backer rod, and then apply sealant to opposite side, tool smooth to concave profile.
F. Remove masking tape.

3.07 INSTALLATION - PLASTIC FILM
A. Install plastic film with adhesive, applied in accordance with film manufacturer's instructions.
B. Place without air bubbles, creases or visible distortion.
C. Install film tight to perimeter of glass and carefully trim film with razor sharp knife. Provide 1/16 inch (1.6 mm) to 1/8 inch (3.2 mm) gap at perimeter of glazed panel unless otherwise required. Do not score the glass.

3.08 PROTECTION
A. Remove and replace glass that is damaged during construction period prior to Date of Substantial Completion.

END OF SECTION
SECTION 08 8723
SAFETY AND SECURITY FILMS

PART 1  GENERAL
1.01  SECTION INCLUDES
   A.  Glazing film applied to new glazing assemblies.
   B.  New Glazing: Factory or shop install film to glazing before installation in frames.
   C.  Glazing assemblies to receive film are indicated on drawings.

1.02  RELATED REQUIREMENTS
   A.  Section 08 4413 - Aluminum Window Walls: New glazing to receive film.
   B.  Section 08 5113 - Aluminum Windows: New windows to receive film.

1.03  REFERENCE STANDARDS
   C.  GSA TS01 - Standard Test Method for Glazing and Window Systems Subject to Dynamic Overpressure Loadings; General Services Administration; 2003.

1.04  SUBMITTALS
   A.  See Section 01 3000 - Administrative Requirements, for submittal procedures.
   B.  Product Data: Manufacturer's data sheets on each product to be used, including:
      1.  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 (102 mm) by 6 inches (152 mm), representing actual product, color, and patterns.
   D.  Test Reports: Detailed reports of full-scale chamber tests to specified criteria, using assemblies identical to those required for this project.
   E.  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.

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 7800 - 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. 3M Window Film; _____: www.solutions.3m.com/#sle.
B. Flexvue Films; _____: www.flexvuefilms.com/#sle.
C. Madico, Inc; _____: www.madico.com/#sle.
D. Substitutions: See Section 01 6000 - Product Requirements.

2.02 SAFETY AND SECURITY GLAZING FILM
A. Blast Resistant Glazing at 20 Feet (6096 mm) Above Ground Level and Higher: Retrofit existing glazing assemblies to provide Level 3B blast resistance when tested in accordance with GSA TS01 at a peak pressure of ___ psi (___ kPa), and a positive phase impulse of ___; and impact resistance complying with ANSI Z97.1 and 16 CFR 1201, Category II, as specified:
   1. 1/4 inch (6 mm) thick clear annealed glass.
   2. Surface applied film.
   3. Supplemental anchoring devices, applied to 4 sides of opening.

2.03 MATERIALS
A. Glazing Film: Transparent polyester film for permanent bonding to glass.
   1. Thickness: 0.008 inch (0.2 mm), minimum.
   2. Color: Clear.
B. Supplementary Anchors: As required by performance criteria and acceptable to Architect.
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 that 40 degrees F (4 degrees C) 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 (2 mm) to 1/8 inch (3 mm) 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. Supplemental Anchors: Install in accordance with manufacturer's instructions and shop drawings.
F. Clean glass and anchoring accessories following installation. Remove excess sealants and other glazing materials from adjacent finished surfaces.

G. 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 Date of Substantial Completion.

END OF SECTION
PART 1 GENERAL

1.01 SECTION INCLUDES
A. Performance criteria for gypsum board assemblies.
B. Acoustic insulation.
C. Acoustic sound putty packs
D. Gypsum sheathing.
E. Cementitious backing board.
F. Gypsum wallboard.
G. Joint treatment and accessories.
H. Textured finish system.
I. Water-resistive barrier over exterior wall sheathing.

1.02 RELATED REQUIREMENTS
A. Section : Building framing and sheathing.
B. Section 06 1000 - Rough Carpentry: Wood blocking product and execution requirements.
C. Section 07 2100 - Thermal Insulation: Acoustic insulation.
D. Section 07 2500 - Weather Barriers: Water-resistive barrier over sheathing.
E. Section 07 8400 - Firestopping: Top-of-wall assemblies at fire rated walls.
F. Section 07 9200 - Joint Sealants: Sealing acoustical gaps in construction other than gypsum board or plaster work.

1.03 REFERENCE STANDARDS
E. ASTM C1002 - Standard Specification for Steel Self-Piercing Tapping Screws for Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs; 2016.
L. ASTM E413 - Classification for Rating Sound Insulation; 2016.

1.04 SUBMITTALS
   A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

PART 2 PRODUCTS

2.01 GYPSUM BOARD ASSEMBLIES
   A. Provide completed assemblies complying with ASTM C840 and GA-216.
   B. Interior Partitions, Indicated as Acoustic: Provide completed assemblies with the following characteristics:
      1. Acoustic Attenuation: STC as indicated calculated in accordance with ASTM E413, based on tests conducted in accordance with ASTM E90.
   C. Fire Rated Assemblies: Provide completed assemblies with the following characteristics:
      1. Gypsum Association File Numbers: Comply with requirements of GA-600 for the particular assembly.

2.02 BOARD MATERIALS
   A. Manufacturers - Gypsum-Based Board:
      7. USG Corporation; ____ : www.usg.com/#sle.
   B. Gypsum Wallboard: Paper-faced gypsum panels as defined in ASTM C1396/C1396M; sizes to minimize joints in place; ends square cut.
      1. Application: Use for vertical surfaces and ceilings, unless otherwise indicated.
      2. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
         a. Mold-resistant board is required whenever board is being installed before the building is enclosed and conditioned.
      3. At Assemblies Indicated with Fire-Rating: Use type required by indicated tested assembly; if no tested assembly is indicated, use Type X board, UL or WH listed.
      4. Thickness:
         a. Vertical Surfaces: 5/8 inch (16 mm).
         b. Ceilings: 5/8 inch (16 mm).
         c. Multi-Layer Assemblies: Thicknesses as indicated on drawings.
   C. Impact Resistant Wallboard:
      1. Application: High traffic areas: 4'-0" A.F.F. at Stairways and Corridors.
      2. Surface Abrasion: Level 3, minimum, when tested in accordance with ASTM C1629/C1629M.
      3. Indentation: Level 1, minimum, when tested in accordance with ASTM C1629/C1629M.
      4. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
      5. Type: Fire resistance rated Type X, UL or WH listed.
      6. Thickness: 5/8 inch (16 mm).
   D. Backing Board For Wet Areas: One of the following products:
      1. Application: Surfaces behind tile in wet areas including tub and shower surrounds and shower ceilings.
      2. ANSI Cement-Based Board: Non-gypsum-based; aggregated Portland cement panels with glass fiber mesh embedded in front and back surfaces complying with ANSI A118.9 or ASTM C1325.
         a. Thickness: 1/2 inch (12.7 mm).
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: Regular.
   4. Regular Board Thickness: 5/8 inch (16 mm).
   5. Edges: Square.

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: Regular, in locations indicated.
   3. Regular Type Thickness: 1/2 inch (13 mm).

2.03 GYPSUM WALLBOARD ACCESSORIES
A. Acoustic Insulation: ASTM C665; preformed glass fiber, friction fit type, unfaced. Thickness: 3-1/2" inch (88.9 mm).
B. Acoustic Putty Packs installed at back boxes in sound rated walls and at interior of exterior furred walls. Products by 3M, Hilti, or equivalent.
C. Water-Resistive Barrier: No. 15 asphalt felt.
D. Joint Materials: ASTM C475/C475M and as recommended by gypsum board manufacturer for project conditions.
   1. Paper Tape: 2 inch (50 mm) wide, creased paper tape for joints and corners, except as otherwise indicated.
E. Screws for Fastening of Gypsum Panel Products to Cold-Formed Steel Studs Less than 0.033 inch (0.84 mm) in Thickness and Wood Members: ASTM C1002; self-piercing tapping screws, corrosion resistant.

PART 3 EXECUTION
3.01 EXAMINATION
A. Verify that project conditions are appropriate for work of this section to commence.

3.02 FRAMING INSTALLATION
A. Blocking: Install wood blocking for support of:
   1. Wall mounted cabinets.
   2. Plumbing fixtures.
   3. Toilet accessories.
   4. Wall mounted door hardware.

3.03 ACOUSTIC ACCESSORIES INSTALLATION
A. Acoustic Insulation: Place tightly within spaces, around cut openings, behind and around electrical and mechanical items within partitions, and tight to items passing through partitions.
B. Acoustic Sealant: Install in accordance with manufacturer's instructions.
   1. Place one bead continuously on substrate before installation of perimeter framing members.
   2. Putty Packs: provide in sound partitions and all Interior of exterior walls , Seal air tight around all back boxes and penetrations with Putty Packs. See details on drawings.

3.04 BOARD INSTALLATION
A. Comply with ASTM C840, GA-216, and manufacturer’s instructions. Install to minimize butt end joints, especially in highly visible locations.
B. Single-Layer Non-Rated: Install gypsum board in most economical direction, with ends and edges occurring over firm bearing.
C. Double-Layer Non-Rated: Use gypsum board for first layer, placed parallel to framing or furring members, with ends and edges occurring over firm bearing. Use glass mat faced gypsum board at exterior walls and at other locations as indicated. Place second layer perpendicular to framing or furring members. Offset joints of second layer from joints of first layer.

D. Fire-Rated Construction: Install gypsum board in strict compliance with requirements of assembly listing.

E. Exterior Sheathing: Comply with ASTM C1280. Install sheathing vertically, with edges butted tight and ends occurring over firm bearing.
   1. Paper-Faced Sheathing: Immediately after installation, protect from weather by application of water-resistant barrier.

F. Exterior Soffits: Install exterior soffit board perpendicular to framing, with staggered end joints over framing members or other solid backing.

G. Cementitious Backing Board: Install over steel framing members and plywood substrate where indicated, in accordance with ANSI A108.11 and manufacturer's instructions.

3.05 INSTALLATION OF TRIM AND ACCESSORIES
   A. Control Joints: Place control joints consistent with lines of building spaces and as indicated.
      1. Not more than 30 feet (10 meters) apart on walls and ceilings over 50 feet (16 meters) long.
   B. Corner Beads: Install at external corners, using longest practical lengths.
   C. Edge Trim: Install at locations where gypsum board abuts dissimilar materials.

3.06 JOINT TREATMENT
   A. Finish gypsum board in accordance with levels defined in ASTM C840, as follows:
      1. Level 4: Walls and ceilings to receive paint finish or wall coverings, unless otherwise indicated.
      2. Level 2: In utility areas, behind cabinetry, and on backing board to receive tile finish.
      3. 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 (0.8 mm).

3.07 TEXTURE FINISH
   A. Apply finish texture coating by means of spraying apparatus in accordance with manufacturer's instructions and to match approved sample.
SECTION 09 3000
TILING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Tile for floor applications.
B. Tile for wall applications.
C. Cementitious backer board as tile substrate.
D. Stone thresholds.
E. Ceramic trim.

1.02 REFERENCE STANDARDS

D. ANSI A108.4 - American National Standard Specifications for Installation of Ceramic Tile with Organic Adhesives or Water Cleanable Tile-Setting Epoxy Adhesive; 2009 (Revised).
N. ANSI A118.4 - American National Standard Specifications for Modified Dry-Set Cement Mortar; 2012 (Revised).
1.03 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide manufacturers' data sheets on tile, mortar, grout, and accessories. Include instructions for using grouts and adhesives.
C. Shop Drawings: Indicate tile layout, patterns, color arrangement, perimeter conditions, junctions with dissimilar materials, thresholds, ceramic accessories, and setting details.

1.04 QUALITY ASSURANCE

1.05 DELIVERY, STORAGE, AND HANDLING

A. Protect adhesives from freezing or overheating in accordance with manufacturer's instructions.

1.06 FIELD CONDITIONS

A. Maintain ambient and substrate temperature of 50 degrees F (10 degrees C) during installation of mortar materials.

PART 2 PRODUCTS

2.01 TILE

A. Manufacturers: All products by the same manufacturer.
   2. Substitutions: See Section 01 6000 - Product Requirements.

B. Glazed Wall Tile: ANSI A137.1, standard grade.
   1. Size: 4-1/4 by 4-1/4 inch (108 by 108 mm), nominal.
   2. Edges: Cushioned.
   3. Color(s): As indicated on drawings on Finish Schedule.
   4. Pattern: as shown on the interior elevations.
   5. Trim Units: Matching bead, bullnose, cove, and base shapes in sizes coordinated with field tile.

C. Porcelain Tile: ANSI A137.1, standard grade.
   1. Size: As indicated in the Finish Schedule.
   2. Thickness: 3/8 inch (9.5 mm).
   3. Edges: Square.
   4. Color(s): As indicated on drawings on Finish Schedule.
   5. Pattern: see Finish Plans.

2.02 TRIM AND ACCESSORIES

A. Transition Strips Basis of Design
   1. Outside corners of wall tile: Schluter Jolley
   2. Floor tile to wall tile: Schluter Dilex-AHK
   3. Tile transitions to carpet and resilient flooring: Burke fusion transition strips, 901 Black
   4. Color: See Finish Schedule
   5. Substitutions: See Section 01 6000 - Product Requirements.

B.

2.03 SETTING MATERIALS

   1. Applications: Use this type of bond coat where indicated and where no other type of bond coat is indicated.

B. Epoxy Adhesive and Mortar Bond Coat: ANSI A118.3.

C. Mortar Bed Materials: Pre-packaged mix of Portland cement, sand, latex additive, and water.
2.04 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 indicated on drawings on Finish Schedule.

2.05 ACCESSORY MATERIALS
A. Reinforcing Mesh: 2 by 2 inch (51 by 51 mm) size weave of 16/16 wire size; welded fabric, galvanized.
B. Backer Board: Cementitious type complying with ANSI A118.9; high density, glass fiber reinforced, 1/2 inch (12.7 mm) thick; 2 inch (51 mm) wide coated glass fiber tape for joints and corners.

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 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.
D. 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.

3.03 INSTALLATION - GENERAL
A. Install tile, thresholds, and stair treads and grout in accordance with applicable requirements of ANSI A108.1a through ANSI A108.13, manufacturer's instructions, and TCNA (HB) recommendations.
B. Lay tile to pattern indicated. Do not interrupt tile pattern through openings.
C. Cut and fit tile to penetrations through tile, leaving sealant joint space. Form corners and bases neatly. Align floor joints.
D. Place tile joints uniform in width, subject to variance in tolerance allowed in tile size. Make grout joints without voids, cracks, excess mortar or excess grout, or too little grout.
E. Form internal angles square and external angles bullnosed.
F. Sound tile after setting. Replace hollow sounding units.
G. Keep control and expansion joints free of mortar, grout, and adhesive.
H. Prior to grouting, allow installation to completely cure; minimum of 48 hours.
I. Grout tile joints unless otherwise indicated. Use standard grout unless otherwise indicated.
J. At changes in plane and tile-to-tile control joints, use tile sealant instead of grout, with either bond breaker tape or backer rod as appropriate to prevent three-sided bonding.
3.04 INSTALLATION - FLOORS - MORTAR BED METHODS
   A. Over interior concrete substrates, install in accordance with TCNA (HB) Method F111, with cleavage membrane, unless otherwise indicated.
      1. Where waterproofing membrane is indicated, with standard grout or no mention of grout type, install in accordance with TCNA (HB) Method F121.
      2. Where epoxy bond coat and grout are indicated, install in accordance with TCNA (HB) Method F132, bonded.
   B. Cleavage Membrane: Lap edges and ends.
   C. Mortar Bed Thickness: 1-1/4 inch (31.8 mm), unless otherwise indicated.

3.05 INSTALLATION - SHOWERS WALLS
   A. At tiled shower receptors install in accordance with TCNA (HB) Method B415, mortar bed floor, and W244, thin-set over cementitious backer unit walls.
   B. Grout with standard grout as specified above.

3.06 CLEANING
   A. Clean tile and grout surfaces.

3.07 PROTECTION
   A. Do not permit traffic over finished floor surface for 4 days after installation.

END OF SECTION
SECTION 09 5100
ACOUSTICAL CEILINGS

PART 1  GENERAL
1.01  SECTION INCLUDES
   A. Acoustical units.
   B. Supplementary acoustical insulation above ceiling.

1.02  REFERENCE STANDARDS
   D. ASTM E1264 - Standard Classification for Acoustical Ceiling Products; 2014.

1.03  SUBMITTALS
   A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
   B. Product Data: Provide data on suspension system components.
   C. Manufacturer's Installation Instructions: Indicate special procedures.

PART 2  PRODUCTS
2.01  MANUFACTURERS
   A. Acoustic Tiles/Panels:

2.02  ACOUSTICAL UNITS
   A. Acoustical Units - General: ASTM E1264, Class A.
   B. Acoustical Panels: Mineral fiber with scrubbable finish, with the following characteristics:
      1. Classification: ASTM E1264 Type IX.
      2. Size: 24 x 48 inch (610 by 1219 mm).
      3. Thickness: 5/8 inches (16 mm).
      5. Suspension System: Exposed grid.
      6. Location: Kitchen area
   C. Acoustical Panels: Painted mineral fiber, ASTM E1264 Type III, with the following characteristics:
      1. Size: 24 x 24 inches (600 x 600 mm).
      2. Thickness: 5/8 inches (15 mm).
      3. Light Reflectance: 87 percent, determined in accordance with ASTM E1264.
      4. Edge: Tegular.
      5. Surface Color: As indicated on drawings.
      7. Location: General

2.03  SUSPENSION SYSTEM(S)
   A. Metal 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.
   B. Exposed Steel Suspension System Type ____: Formed steel, commercial quality cold rolled; heavy-duty.
      1. Profile: Tee; 15/16 inch (24 mm) wide face.
2. Construction: Double web.

2.04 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: Provide L-shaped molding for mounting at same elevation as face of grid.
C. Acoustical Insulation: Specified in Section 07 2100.
   1. Thickness: 5-1/2" inch (____ mm).
D. 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 C636/C636M, ASTM E580/E580M, and manufacturer's instructions and as supplemented in this section.
B. Rigidly secure system, including integral mechanical and electrical components, for maximum deflection of 1:360.
C. Locate system on room axis according to reflected plan.
D. Install after major above-ceiling work is complete. Coordinate the location of hangers with other work.
E. Hang suspension system independent of walls, columns, ducts, pipes and conduit. Where carrying members are spliced, avoid visible displacement of face plane of adjacent members.
F. Where ducts or other equipment prevent the regular spacing of hangers, reinforce the nearest affected hangers and related carrying channels to span the extra distance.
G. Do not support components on main runners or cross runners if weight causes total dead load to exceed deflection capability.
H. Support fixture loads using supplementary hangers located within 6 inches (150 mm) of each corner, or support components independently.
I. Do not eccentrically load system or induce rotation of runners.
J. 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. Fit border trim neatly against abutting surfaces.
D. Install units after above-ceiling work is complete.
E. Install acoustical units level, in uniform plane, and free from twist, warp, and dents.
F. Cutting Acoustical Units:
   1. Make field cut edges of same profile as factory edges.
G. Lay acoustical insulation for a distance of 48 inches (1200 mm) either side of acoustical partitions as indicated.

END OF SECTION
SECTION 09 6500
RESILIENT FLOORING

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Resilient tile flooring.
B. Resilient base.
C. Resilient stair accessories.
D. Installation accessories.

1.02 RELATED REQUIREMENTS
A. Section 01 6116 - Volatile Organic Compound (VOC) Content Restrictions.

1.03 REFERENCE STANDARDS

1.04 SUBMITTALS
A. Product Data: Provide data on specified products, describing physical and performance characteristics; including sizes, patterns and colors available; and installation instructions.

1.05 DELIVERY, STORAGE, AND HANDLING
A. Store all materials off of the floor in an acclimatized, weather-tight space.
B. Protect roll materials from damage by storing on end.
C. Do not double stack pallets.

1.06 FIELD CONDITIONS
A. Store materials for not less than 48 hours prior to installation in area of installation at a temperature of 70 degrees F (21 degrees C) to achieve temperature stability. Thereafter, maintain conditions above 55 degrees F (13 degrees C).

PART 2 PRODUCTS

2.01 TILE FLOORING
A. Rubber Tile: Homogeneous, color and pattern throughout thickness.
   1. Manufacturers:
      a. Basis of Design:
         1) Gerflor, Teraflex Multi-use 6.2
            (a) Location: As indicated on the drawings.
         2) Mannington Burke, Color Scape Sculptured, 701 Black
            (a) Location: Stage and Music Storage
      b. Substitutions: See Section 01 6000 - Product Requirements.
   2. Minimum Requirements: Comply with ASTM F1344, of Class corresponding to type specified.
   3. Size: As indicated on drawings
   4. Pattern: As indicated on the drawings.
   5. Color: As listed in the Finish Schedule.

B. Linoleum Tile: Homogeneous wear layer bonded to backing, with color and pattern through wear layer thickness.
   1. Manufacturers:
      b. Substitutions: See Section 01 6000 - Product Requirements.
   2. Minimum Requirements: Comply with ASTM F2195, Type corresponding to type specified.
4. Thickness: 0.100 inch (2.5 mm), minimum, excluding backing.
5. Pattern: As indicated on the drawings.
6. Color: As indicated on drawings.

2.02 STAIR COVERING
A. Stair Treads: Rubber; full width and depth of stair tread two-piece (tread and riser shall be separate pieces); tapered thickness.
   1. Manufacturers:
   2. Nominal Thickness: 0.250 inch (6.35 mm).
   5. Color: As indicated on drawings.

2.03 RESILIENT BASE
A. Resilient Base: ASTM F1861, Type TS rubber, vulcanized thermoset; top set Style B, Cove.
   1. Manufacturers:
      d. Basis of Design: Mannington Vurke, 4".
      e. Substitutions: See Section 01 6000 - Product Requirements.
   2. Height: 4 inch (100 mm).
   3. Thickness: 0.125 inch (3.2 mm).
   5. Length: Roll.
   7. Accessories: Premolded external corners and internal corners.

2.04 ACCESSORIES
A. Primers, Adhesives, and Seam Sealer: Waterproof; types recommended by flooring manufacturer.
   1. VOC Content Limits: As specified in Section 01 6116.
B. Transition Strips Basis of Design
   1. Carpet transitions to resilient flooring: Burke fusion transition strips
   2. Rubber floor to concrete: Mannington dry back underslung reducer 735
   3. LVT or Linoleum to LVT: Powerhold 102 LVT Joiner
   4. Color: See Finish Schedule
   5. Substitutions: See Section 01 6000 - Product Requirements.
C. Stair Nosing:
   1. Manufacturer: Mannington, Commercial Step Nosing 580
   2. Color: 701 Black
   3. Location: All stair noses

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 wall surfaces are smooth and flat within the tolerances specified for that type of work, are dust-free, and are ready to receive resilient base.
C. Cementitious Sub-floor Surfaces: Verify that substrates are dry enough and ready for resilient flooring installation by testing for moisture and pH.
   1. Obtain instructions if test results are not within limits recommended by resilient flooring manufacturer and adhesive materials manufacturer.

3.02 PREPARATION
   A. Prepare floor substrates as recommended by flooring and adhesive manufacturers.
   B. Remove sub-floor ridges and bumps. Fill minor low spots, cracks, joints, holes, and other defects with sub-floor filler to achieve smooth, flat, hard surface.
   C. Prohibit traffic until filler is fully cured.
   D. Clean substrate.

3.03 INSTALLATION - GENERAL
   A. Starting installation constitutes acceptance of sub-floor conditions.
   B. Install in accordance with manufacturer's written instructions.

3.04 INSTALLATION - TILE FLOORING
   A. Mix tile from container to ensure shade variations are consistent when tile is placed, unless otherwise indicated in manufacturer's installation instructions.

3.05 INSTALLATION - RESILIENT BASE
   A. Fit joints tightly and make vertical. Maintain minimum dimension of 18 inches (45 mm) between joints.
   B. Install base on solid backing. Bond tightly to wall and floor surfaces.

3.06 INSTALLATION - STAIR COVERINGS
   A. Adhere over entire surface. Fit accurately and securely.

3.07 CLEANING
   A. Remove excess adhesive from floor, base, and wall surfaces without damage.
   B. Clean in accordance with manufacturer's written instructions.

3.08 PROTECTION
   A. Prohibit traffic on resilient flooring for 48 hours after installation.

END OF SECTION
SECTION 09 6700
FLUID-APPLIED FLOORING

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Fluid-applied flooring and base.

1.02 RELATED REQUIREMENTS
A. Section 01 6116 - Volatile Organic Compound (VOC) Content Restrictions.
B. Section 07 9200 - Joint Sealants: Sealing joints between fluid-applied flooring and adjacent construction and fixtures.

1.03 SUBMITTALS
A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide data on specified products, describing physical and performance characteristics; sizes, patterns and colors available.
C. Samples: Submit two samples, 6 inch by 6 inch inch (150 by 150 mm) in size illustrating color and pattern for each floor material for each color specified.
D. Manufacturer's Installation Instructions: Indicate special procedures and perimeter conditions requiring special attention.
E. Maintenance Data: Include maintenance procedures, recommended maintenance materials, procedures for stain removal, repairing surface, and suggested schedule for cleaning.
F. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 01 6000 - Product Requirements, for additional provisions.
   2. Extra Top Coat Materials: 2 gallons (8 liters).

1.04 QUALITY ASSURANCE
A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with minimum three years documented experience.
B. Applicator Qualifications: Company specializing in performing the work of this section.
   1. Minimum 3 years of documented experience.

1.05 DELIVERY, STORAGE, AND HANDLING
A. Store resin materials in a dry, secure area.
B. Store materials for three days prior to installation in area of installation to achieve temperature stability.

1.06 FIELD CONDITIONS
A. Maintain minimum temperature in storage area of 55 degrees F (13 degrees C).
B. Store materials in area of installation for minimum period of 24 hours prior to installation.
C. Maintain ambient temperature required by manufacturer 72 hours prior to, during, and 24 hours after installation of materials.

PART 2 PRODUCTS

2.01 MANUFACTURERS
A. Fluid-Applied Flooring:
   2. Substitutions: See Section 01 6000 - Product Requirements.

2.02 FLUID-APPLIED FLOORING SYSTEMS
A. Fluid-Applied Flooring: Epoxy base coat(s), polyurethane top coat, no aggregate.
   1. Texture: Medium texture.
   2. Sheen: High gloss.
3. **Color**: As selected by Architect.


5. **Products**:
   a. **System Characteristics**:
      1) Color and Pattern: Selected by Architect
      2) Wearing Surface: Medium texture
      3) Integral Cove Base: 4"
      4) Overall System Thickness: nominal 3/16-1/4”.

   b. **System Components**: Manufacturer's standard components that are compatible with each other and as follows:
      1) **Mortar**:
         (a) Material design basis: Flagstone
         (b) Resin: Urethane.
         (c) Formulation Description: (4) four-component, 100 percent solids.
         (d) Application Method: Screed, Trowel.
         (e) Thickness of Coats: 3/16”.
         (f) Number of Coats: One.
      2) **Top coat**:
         (a) Material design basis: UT Sealer
         (b) Resin: Urethane.
         (c) Delete first subparagraph below if unnecessary.
         (d) Formulation Description: (2) two-component, 100 percent solids.
         (e) Type: pigmented.
         (f) Finish: standard.
         (g) Number of Coats: One.

   c. **Note**: Components listed above are the basis of design intent; all bids will be compared to this standard including resin chemistry, color, wearing surface, thickness, and installation procedures, including number of coats. Contractor shall be required to comply with all the requirements of the Specifications and all of the components required by the Specifications, whether or not such products are specifically listed above.

   1) **System Physical Properties**: Provide resinous flooring system with the following minimum physical property requirements when tested according to test methods indicated:
      (a) Subparagraphs below are examples only and are based on test methods required in ASTM C 722 and manufacturers' literature. Manufacturers’ testing procedures differ; revise test methods indicated and insert additional requirements to suit Project.
      (b) Compressive Strength: 7,700 psi after 7 days per ASTM C 579.
      (c) Tensile Strength: 1,000 psi per ASTM C 307.
      (d) Flexural Strength: 2,400 psi per ASTM C 580.
      (e) Water Absorption: < 1% per ASTM C 413.
      (f) Impact Resistance: > 160 in. lbs. per ASTM D 2794.
      (g) If needed, insert, in first subparagraph below, requirements for extent of burning.
      (h) Flammability: Class 1 per ASTM E-648.
      (i) Hardness: 80 to 84, Shore D per ASTM D 2240.

   d. **Stonhard, Flagstone, www.stonhard.com**.

   e. **Substitutions**: See Section 01 6000 - Product Requirements.

### 2.03 ACCESSORIES

A. **Primer**: Type recommended by fluid-applied flooring manufacturer.

C. Transition Strips Basis of Design
   1. Manufacturer: See Finish Schedule
   2. Color: See Finish Schedule
   3. Substitutions: See Section 01 6000 - Product Requirements.

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 flooring.
   B. Verify that sub-floor surfaces are dust-free and free of substances that could impair bonding of materials to sub-floor surfaces.
   C. Verify that concrete sub-floor surfaces are ready for flooring installation by testing for moisture emission rate and alkalinity; obtain instructions if test results are not within limits recommended by flooring materials manufacturer.
   D. Verify that required floor-mounted utilities are in correct location.

3.02 PREPARATION
   A. General: Prepare and clean substrates according to resinous flooring manufacturer's written instructions for substrate indicated. Provide clean, dry, and neutral Ph substrate for resinous flooring application.
   B. Concrete Substrates: Provide sound concrete surfaces free of laitance, glaze, efflorescence, curing compounds, form-release agents, dust, dirt, grease, oil, and other contaminants incompatible with resinous flooring.
      1. Mechanically prepare substrates as follows:
         a. Shot-blast surfaces with an apparatus that abrades the concrete surface, contains the dispensed shot within the apparatus, and recirculates the shot by vacuum pickup.
         b. Comply with ASTM C 811 requirements, unless manufacturer's written instructions are more stringent.
      2. Verify that concrete substrates have neutral Ph and that resinous flooring will adhere to them. Perform tests recommended by manufacturer. Proceed with application only after substrates pass testing.
      3. Repair damaged and deteriorated concrete according to resinous flooring manufacturer's written recommendations.
   C. Use patching and fill material to fill holes and depressions in substrates according to manufacturer's written instructions.
   D. Treat control joints and other nonmoving substrate cracks to prevent cracks from reflecting through resinous flooring according to manufacturer's written recommendations. Allowances should be included for Stonflex MP7 joint fill material, and CT5 concrete crack treatment.
   E. Vacuum clean substrate.
   F. Apply primer to surfaces required by flooring manufacturer.

3.03 INSTALLATION - ACCESSORIES
   A. Install terminating cap strip at top of base; attach securely to wall substrate.

3.04 INSTALLATION - FLOORING
   A. Apply in accordance with manufacturer's instructions.
   B. Apply each coat to minimum thickness indicated.
   C. Finish to smooth level surface.
   D. General: Apply components of resinous flooring system according to manufacturer's written instructions to produce a uniform, monolithic wearing surface of thickness indicated.
      1. Coordinate application of components to provide optimum adhesion of resinous flooring system to substrate, and optimum intercoat adhesion.
2. Cure resinous flooring components according to manufacturer's written instructions. Prevent contamination during application and curing processes.

3. At substrate expansion and isolation joints, provide joint in resinous flooring to comply with resinous flooring manufacturer's written recommendations.
   a. Apply joint sealant to comply with manufacturer's written recommendations.

E. Apply primer where required by resinous system, over prepared substrate at manufacturer's recommended spreading rate.

F. Integral Cove Base: Stonclad UR mortar, apply cove base mix to wall surfaces before applying flooring. Apply according to manufacturer's written instructions and details including those for taping, mixing, priming, troweling, sanding, of cove base. Round internal and external corners.
   1. Integral Cove Base: 6" inches high.

G. Mortar: Mix mortar material according to manufacturer's recommended procedures. Uniformly spread mortar over substrate at manufacturer's recommended height using specially designed trowel and or Screed box. Broadcast desired light texture directly into mortar base. Field verify texture needed

H. Apply topcoat in number of coats indicated for flooring system and at spreading rates recommended in writing by manufacturer.

I. Cove at vertical surfaces.

3.05 TERMINATIONS
   A. Chase edges to “lock” the flooring system into the concrete substrate along lines of termination.
   B. Penetration Treatment: Lap and seal the flooring system onto the perimeter of the penetrating item by bridging over compatible elastomer at the interface to compensate for possible movement.
   C. Trenches: Continue flooring system into trenches to maintain monolithic protection. Treat cold joints to assure bridging of potential cracks.
   D. Treat floor drains by chasing the flooring system to lock in place at point of termination

3.06 JOINTS AND CRACKS
   A. Treat control joints to bridge potential cracks and to maintain monolithic protection.
   B. Treat cold joints and construction joints to bridge potential cracks and to maintain monolithic protection on horizontal and vertical surfaces as well as horizontal and vertical interfaces.
   C. Discontinue floor coating system at vertical and horizontal contraction and expansion joints by installing backer rod and compatible sealant after coating installation is completed. Provide sealant type recommended by manufacturer for traffic conditions and chemical exposures to be encountered

3.07 PROTECTION
   A. Prohibit traffic on floor finish for 48 hours after installation.
   B. Barricade area to protect flooring until fully cured.

END OF SECTION
SECTION 09 6813
TILE CARPETING

PART 1  GENERAL

1.01  SECTION INCLUDES
A. Carpet tile, fully adhered.
B. Entry (walk-off) carpet tile, fully adhered

1.02  RELATED REQUIREMENTS
A. Finish Drawings for Basis of Design colors and patterns.
B. Section 01 6116 - Volatile Organic Compound (VOC) Content Restrictions.
C. Section 09 6513 "Resilient Wall Base and Accessories" for resilient wall base and accessories installed with carpet tile

1.03  REFERENCE STANDARDS

1.04  PREINSTALLATION MEETINGS
A. Review methods and procedures related to carpet tile installation including, but not limited to, the following:
   1. Review delivery, storage, and handling procedures.
   2. Review ambient conditions and ventilation procedures.
   3. Review subfloor preparation procedures

1.05  SUBMITTALS
A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Product Data: For each type of product.
   1. Include manufacturer's written data on physical characteristics, durability, and fade resistance.
      a. Written data shall include a detailed specification demonstrating conformance to the performance criteria included herein.
      b. Color brochure or physical samples of all options in proposed product for review and evaluation of color and pattern options.
   2. Include manufacturer's written installation recommendations for each type of substrate.
C. Sustainable Design Submittals:
   1. Documentation demonstrating compliance with Living Building Challenge "Materials Petal" requirements by containing no chemicals listed on "The Red List".
   2. Documentation demonstrating participation in a free carpet reclamation take-back recycling program, guaranteeing reutilization of materials.
D. Shop Drawings: For carpet tile installation, plans showing the following:
   1. Columns, doorways, enclosing walls or partitions, built-in cabinets, and locations where cutouts are required in carpet tiles.
   2. Carpet tile type, color, and dye lot.
   3. Type of subfloor.
   4. Type of installation.
   5. Pattern of installation.
6. Pattern type, location, and direction.
7. Pile direction.
8. Type, color, and location of insets and borders.
9. Type, color, and location of edge, transition, and other accessory strips.
10. Transition details to other flooring materials.

E. Samples: For each of the following products and for each color and texture required. Label each Sample with manufacturer's name, material description, color, pattern, and designation indicated on Drawings and in schedules.
1. Carpet Tile: Full-size Samples of proposed carpet; reflecting Architect's sample for pattern and color range.
2. Exposed Edge, Transition, and Other Accessory Stripping: 12-inch-long Samples.

F. Sustainable Design Submittal: Submit VOC content documentation for adhesives.

G. Maintenance Data: Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning.
1. Methods for maintaining carpet tile, including cleaning and stain-removal products and procedures and manufacturer's recommended maintenance schedule.
2. Precautions for cleaning materials and methods that could be detrimental to carpet tile.

H. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
1. See Section 01 6000 - Product Requirements, for additional provisions.
2. Extra Carpet Tiles: Quantity equal to 5 percent of total installed of each color and pattern installed.

1.06 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing specified carpet tile with minimum three years documented experience.

B. Installer Qualifications: An experienced installer who is certified by the International Certified Floorcovering Installers Association at the Commercial II certification level.

C. Product Test Reports: For carpet tile, for tests performed by a qualified testing agency.

D. Testing Agency Qualifications: Independent firm specializing in performing testing and inspections of the type specified in this section.

1.07 FIELD CONDITIONS

A. Comply with CRI 104 "Standard for Installation of Commercial Carpet - September 2015" for temperature, humidity, and ventilation limitations.

B. Environmental Limitations: Do not deliver or install carpet tiles until spaces are enclosed and weathertight, wet-work in spaces is complete and dry, and ambient temperature and humidity conditions are maintained at levels planned for building occupants during the remainder of the construction period.

C. Do not install carpet tiles over concrete slabs until slabs have cured and are sufficiently dry to bond with adhesive and concrete slabs have pH range recommended by carpet tile manufacturer.

D. Where demountable partitions or other items are indicated for installation on top of carpet tiles, install carpet tiles before installing these items.

E. Deliver products to Project Site in stacked and orderly manner. Full pallets shall contain no more than 30 boxes of carpet tile.

1.08 WARRANTY

A. Special Warranty for Carpet Tiles: Manufacturer agrees to repair or replace components of carpet tile installation that fail in materials or workmanship within specified warranty period.
1. Warranty does not include deterioration or failure of carpet tile due to unusual traffic, failure of substrate, vandalism, or abuse.
2. Failures include, but are not limited to, the following:
   a. Staining
b. Edge raveling, zippering, snags, and runs.
c. Dimensional instability, such as shrinking or stretching.
d. Excess static discharge.
e. Loss of tuft-bind strength.
f. Loss of face fiber (no more than 10 percent by weight).
g. Delamination.
h. Significant changes in color due to exposure to light or atmospheric contaminants.

3. Warranty: Commercial Lifetime.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Tile Carpeting:
   1. See drawings and finish schedule for manufacturers and patterns.
   2. Substitutions: See Section 01 6000 - Product Requirements.

2.02 PERFORMANCE REQUIREMENTS - PATTERNED CARPET TILE

A. Specifications listed are minimum requirements; products submitted must be of equal or
greater quality, as judged by the Architect.
   1. Minimum Quality Standard: Performance and construction of carpet shall be equal to or
superior to the following:
      a. Manufacturer: See drawings and finish schedule for manufacturers and patterns.
   2. Mannington carpet tile is offered as an aesthetic basis of design only. Carpet tiles shall
meet performance criteria outlined in document and need not match all qualities of
Mannington carpet tile.

B. Colors:
   1. Submit proposed colors and patterns to Architect for prior approval.
   2. Colors as selected by Architect from manufacturer's full range, except two (2) custom
colors (minimum) are also required.

C. Pattern: As selected by Architect from manufacturer's full range, matching Architect's samples.

D. Fiber Content: 100 percent solution-dyed nylon, type 6,6 or type 6..

E. Tufted Yarn Weight: 20 ounces, minimum.

F. Density: 6000 ounces/cubic yard, minimum.

G. Backing System: Shall include a moisture barrier.

H. Applied Treatments:
   2. Antimicrobial Treatment: Manufacturer's standard treatment that protects carpet tiles as
follows:
      a. Antimicrobial Activity: Not less than 2-mm halo of inhibition for gram-positive bacteria,
not less than 1-mm halo of inhibition for gram-negative bacteria, and no fungal
growth, according to AATCC 174.

I. Performance Characteristics:
   1. Appearance Retention Rating (TARR Traffic Rating): Heavy traffic, 3.0 minimum according
to ASTM D 7330.
   2. Critical Radiant Flux Classification: Not less than 0.45 W/sq. cm according to NFPA 253.
   3. Dry Breaking Strength: Not less than 100 lbf according to ASTM D 2646.
   4. Tuft Bind: Not less than 10 lbf according to ASTM D 1335.
   5. Delamination: Not less than 3.5 lbf/in. according to ASTM D 3936.
   6. Dimensional Tolerance: Within 1/32 inch of specified size dimensions, as determined by
physical measurement.
   7. 7.
   8. Dimensional Stability: 0.2 percent or less according to ISO 2551 (Aachen Test).
9. Colorfastness to Light: Not less than 4 after 60 AFU (AATCC fading units) according to AATCC 16, Option E.
10. Electrostatic Propensity: Less than 3.5 kV according to AATCC 134.
11. Electrostatic Propensity: Less than 3.5 kV according to AATCC 134.

2.03 PERFORMANCE REQUIREMENTS - ENTRY (WALK-OFF) CARPET TILE

A. Specifications listed are minimum requirements; products submitted must be of equal or greater quality, as judged by the Architect.
   1. Minimum Quality Standard: Performance and construction of carpet shall be equal to or superior to the following:
      a. Manufacturer: Mannington Commercial.
      b. See drawings and Finish Schedule

B. Colors:
   1. Submit proposed colors and patterns to Architect for prior approval.
   2. Colors as selected by Architect from manufacturer's full range, except two (2) custom colors (minimum) are also required.

C. Pattern: As selected by Architect from manufacturer's full range, matching Architect's samples.

D. Fiber Content: 100 percent solution-dyed nylon, type 6,6.

E. Tufted Yarn Weight: 38 ounces, minimum.

F. Density: 8000 ounces/cubic yard.

G. Backing System: Shall include a moisture barrier.

H. Applied Treatments:
   2. Antimicrobial Treatment: Manufacturer's standard treatment that protects carpet tiles as follows:
      a. Antimicrobial Activity: Not less than 2-mm halo of inhibition for gram-positive bacteria, not less than 1-mm halo of inhibition for gram-negative bacteria, and no fungal growth, according to AATCC 174.

I. Performance Characteristics:
   1. Appearance Retention Rating (TARR Traffic Rating): Heavy traffic, 3.0 minimum according to ASTM D 7330.
   2. Critical Radiant Flux Classification: Not less than 0.45 W/sq. cm according to NFPA 253.
   3. Dry Breaking Strength: Not less than 100 lbf according to ASTM D 2646.
   4. Tuft Bind: Not less than 10 lbf according to ASTM D 1335.
   5. Delamination: Not less than 3.5 lbf/in. according to ASTM D 3936.
   6. Dimensional Tolerance: Within 1/32 inch of specified size dimensions, as determined by physical measurement.
   7. Dimensional Stability: 0.2 percent or less according to ISO 2551 (Aachen Test).
   8. Colorfastness to Crocking: Not less than 4, wet and dry, according to AATCC 165.
   9. 9.
   10. Colorfastness to Light: Not less than 4 after 60 AFU (AATCC fading units)

2.04 MATERIALS

A. Tile Carpeting: Tufted, manufactured in one color dye lot.
   1. Basis of Design Product: See drawings and finish schedule for patterns manufactured by see drawings.
   4. Critical Radiant Flux: Minimum of 0.22 watts/sq cm, when tested in accordance with ASTM E648 or NFPA 253.
   5. Surface Flammability Ignition: Pass ASTM D2859 (the "pill test").
   6. Maximum Electrostatic Charge: 3 Kv. at 20 percent relative humidity.
2.05 ACCESSORIES

A. Edge Strips: Embossed aluminum, color as selected by Architect.
B. Trowelable Leveling and Patching Compounds: Latex-modified, hydraulic-cement-based formulation provided or recommended by carpet tile manufacturer.
C. Adhesives: Water-resistant, mildew-resistant, nonstaining, pressure-sensitive type to suit products and subfloor conditions indicated, that comply with flammability requirements for installed carpet tile, and are recommended by carpet tile manufacturer for releasable installation.
D. Transition Strips Basis of Design
   1. Carpet to LVT - Burke Fusion Strip, Size as required
   2. Carpet to Concrete - Power Hold LVT 113 or LVT 115, Size as Required
   3. Color: See Finish Schedule
   4. Substitutions: See Section 01 6000 - Product Requirements.

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. Cementitious Sub-floor Surfaces: Verify that substrates are dry enough and ready for flooring installation by testing for moisture and pH.
   1. Obtain instructions if test results are not within limits recommended by flooring material manufacturer and adhesive materials manufacturer.
C. Examine carpet tile for type, color, pattern, and potential defects.
D. Concrete Slabs: Verify finishes comply with requirements specified in Section 03 3000 "Cast-in-Place Concrete" and surfaces are free of cracks, ridges, depressions, scale, and foreign deposits.
   1. Moisture Testing: Perform tests so that each test area does not exceed 200 sq. ft., and perform no fewer than three tests in each installation area and with test areas evenly spaced in installation areas.
      a. Anhydrous Calcium Chloride Test: ASTM F 1869. Proceed with installation only after substrates have maximum moisture-vapor-emission rate of 3 lb. of water/1000 sq. ft. in 24 hours.
      b. Relative Humidity Test: Using in situ probes, ASTM F 2170. Proceed with installation only after substrates have a maximum 75 percent relative humidity level measurement.
      c. Perform additional moisture tests recommended in writing by adhesive and carpet tile manufacturers. Proceed with installation only after substrates pass testing.
E. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Prepare floor substrates as recommended by flooring and adhesive manufacturers.
B. Apply, trowel, and float filler to achieve smooth, flat, hard surface. Prohibit traffic until filler is cured.
C. General: Comply with CRI 104 "Standard for Installation of Commercial Carpet - September 2015" and with carpet tile manufacturer's written installation instructions for preparing substrates indicated to receive carpet tile.
D. Use trowelable leveling and patching compounds, according to manufacturer's written instructions, to fill cracks, holes, depressions, and protrusions in substrates. Fill or level cracks, holes and depressions 1/8 inch wide or wider, and protrusions more than 1/32 inch unless more stringent requirements are required by manufacturer's written instructions.
E. Concrete Substrates: Remove coatings, including curing compounds, and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, without using solvents. Use mechanical methods recommended in writing by adhesive and carpet tile manufacturers.

F. Broom and vacuum clean substrates to be covered immediately before installing carpet tile.

3.03 INSTALLATION

A. General: Comply with CRI 104 "Standard for Installation of Commercial Carpet - September 2015" Section 10, "Carpet Tile" and with carpet tile manufacturer's written installation instructions.

B. Starting installation constitutes acceptance of sub-floor conditions.

C. Install carpet tile in accordance with manufacturer's instructions.

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. Locate change of color or pattern between rooms under door centerline.

G. Installation Method: Glue down; install every tile with full-spread, releasable, pressure-sensitive adhesive.

H. Maintain dye-lot integrity. Do not mix dye lots in same area.

I. Maintain pile-direction patterns recommended in writing by carpet tile manufacturer.

J. Cut and fit carpet tile to butt tightly to vertical surfaces, permanent fixtures, and built-in furniture including cabinets, pipes, outlets, edgings, thresholds, and nosings. Bind or seal cut edges as recommended by carpet tile manufacturer.

K. Extend carpet tile into toe spaces, door reveals, closets, open-bottomed obstructions, removable flanges, alcoves, and similar openings.

L. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on carpet tile as marked on subfloor. Use nonpermanent, nonstaining marking device.

M. Install pattern parallel to walls and borders, unless indicated otherwise.

N. Trim carpet tile neatly at walls and around interruptions.

O. Complete installation of edge strips, concealing exposed edges.

3.04 CLEANING

A. Perform the following operations immediately after installing carpet tile:
   1. Remove excess adhesive and other surface blemishes using cleaner recommended by carpet tile manufacturer.
   2. Remove yarns that protrude from carpet tile surface.

3.05 PROTECTION

A. Protect installed carpet tile in compliance with CRI 104 "Standard for Installation of Commercial Carpet - September 2015."

B. Protect carpet tile against damage from construction operations and placement of equipment and fixtures during the remainder of construction period. Use protection methods indicated or recommended in writing by carpet tile manufacturer.

END OF SECTION
SECTION 09 8430
SOUND-ABSORBING WALL AND CEILING UNITS

PART 1  GENERAL

1.01  SECTION INCLUDES
A. Sound-absorbing panels.
B. Sound-absorbing ceiling baffles.
C. Mounting accessories.

1.02  SUBMITTALS
A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Product Data: Manufacturer's printed data sheets for products specified.
C. Shop Drawings: Fabrication and installation details, panel layout, and fabric orientation.
D. Selection Samples: Manufacturer's color charts for fabric covering, indicating full range of fabrics, colors, and patterns available.

1.03  QUALITY ASSURANCE
A. Manufacturer Qualifications: Company with not less than five years of experience in manufacturing acoustical products similar to those specified.

1.04  DELIVERY, STORAGE, AND HANDLING
A. Protect acoustical units from moisture during shipment, storage, and handling. Deliver in factory-wrapped bundles; do not open bundles until units are needed for installation.
B. Store units flat, in dry, well-ventilated space; do not stand on end.
C. Protect edges from damage.

PART 2  PRODUCTS

2.01  CEMENTIOUS WOOD FIBER SOUND ABSORBING PANELS
A. Basis of Design: Tectum Direct-Attach, by Armstrong Ceiling and Wall Solutions
   2. Core Material: Cementitious Wood Fiber.
   4. Fire Performance: Class A.
   5. Color: Paint to match adjacent ceiling materials. Use only type of paint recommended by panel manufacturer.
   6. Panel Thickness: 2".
   7. Attachment:
      a. Direct-Attach per Manufacturer's mounting methods.
   8. Location: As indicated on drawings.

2.02  FABRIC-COVERED SOUND-ABSORBING UNITS
A. Manufacturers:
   1. Kirei, Echo Panels - Tiles - See detail on plans for layout, Class A
   2. Autex, Cube Panel
   3. Location: Gymnasium ceiling and walls as indicated in the Drawings.
B. Sound Absorbing Units: Prefinished, factory assembled fabric-covered panels.
   1. Location: As indicated on the Drawings.
C. Fabric-Covered Acoustical Ceiling Baffles:
   1. Baffle Core: Manufacturer's standard core.
   2. Location: As indicated on the Drawings.
2.03 FABRICATION
A. Fabric Wrapped, General: Fabricate panels to sizes and configurations as indicated on Interior Elevatipn drawings, with fabric facing installed without sagging, wrinkles, blisters, or visible seams.
   1. Where radiused or mitered corners are indicated, install fabric to avoid seams or gathering of material.
   2. For panels suspended from ceiling, provide fabric covering both sides, with seams only at panel edges.
B. Tolerances: Fabricate to finished tolerance of plus or minus 1/16 inch (1.6 mm) for thickness, overall length and width, and squareness from corner to corner.

2.04 ACCESSORIES
A. Ceiling-Suspended Accessories: Manufacturer's standard accessories at locations as indicated on each acoustical unit, sized appropriately for weight of acoustical unit.

PART 3 EXECUTION
3.01 EXAMINATION
A. Examine substrates for conditions detrimental to installation of acoustical units. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION
A. Install acoustical units in locations as indicated, following manufacturer's installation instructions.
B. Align panels accurately, with edges plumb and top edges level. Scribe to fit accurately at adjoining work and penetrations.
C. Suspend ceiling baffles at locations and heights as indicated.
D. Install acoustical units to construction tolerances of plus or minus 1/16 inch (1.6 mm) for the following:
   1. Plumb and level.
   2. Flatness.

3.03 CLEANING
A. Clean fabric facing upon completion of installation from dust and other foreign materials, following manufacturer's instructions.

3.04 PROTECTION
A. Provide protection of installed acoustical panels until Date of Substantial Completion.
B. Replace panels that cannot be cleaned and repaired to satisfaction of the Architect.

END OF SECTION
PART 1 GENERAL

1.01 SECTION INCLUDES
   A. Surface preparation.
   B. Field application of paints.
   C. Scope: Finish 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 factory-finished unless otherwise indicated; materials and products having factory-applied primers are not considered factory finished.
      2. Items indicated to receive other finishes.
      3. Items indicated to remain unfinished.
      4. Fire rating labels, equipment serial number and capacity labels, and operating parts of equipment.
      5. Floors, unless specifically indicated.
      7. Concealed pipes, ducts, and conduits.

1.02 RELATED REQUIREMENTS
   A. Section 01 6116 - Volatile Organic Compound (VOC) Content Restrictions.

1.03 REFERENCE STANDARDS
   B. SSPC-SP 1 - Solvent Cleaning; 2015, with Editorial Revision (2016).
   C. SSPC-SP 6 - Commercial Blast Cleaning; 2007.

1.04 SUBMITTALS
   A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
   B. Product Data: Provide complete list of products to be used, with the following information for each:
      1. Manufacturer's name, product name and/or catalog number, and general product category (e.g. "alkyd enamel").
      2. MPI product number (e.g. MPI #47).
      3. Cross-reference to specified paint system(s) product is to be used in; include description of each system.
   C. Samples: Submit three paper "draw down" samples, 8-1/2 by 11 inches (216 by 279 mm) in size, illustrating range of colors available for each finishing product specified.
      1. Where sheen is specified, submit samples in only that sheen.

1.05 QUALITY ASSURANCE
   A. Manufacturer Qualifications: Company specializing in manufacturing the products specified, with minimum three years documented experience.

1.06 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 (7 degrees C) and a maximum of 90 degrees F (32 degrees C), in ventilated area, and as required by manufacturer's instructions.

1.07 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. Provide lighting level of 80 ft candles (860 lx) measured mid-height at substrate surface.

PART 2 PRODUCTS

2.01 MANUFACTURERS
A. Provide paints and finishes used in any individual system from the same manufacturer; no exceptions.

2.02 PAINTS AND FINISHES - GENERAL
A. Paints and Finishes: Ready mixed, unless required to be a field-catalyzed paint.
1. Provide paints and finishes of a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating, with good flow and brushing properties, and capable of drying or curing free of streaks or sags.
2. Supply each paint material in quantity required to complete entire project's work from a single production run.
3. Do not reduce, thin, or dilute paint or finishes or add materials unless such procedure is specifically described in manufacturer's product instructions.
B. Sheens: Provide the sheens specified; where sheen is not specified, sheen will be selected later by Architect from the manufacturer's full line.
C. Colors: As indicated in Color Schedule.

2.03 PAINT SYSTEMS - EXTERIOR
1. Two top coats and one coat primer.
2. Top Coat(s): Exterior Light Industrial Coating, DTM Acrylic, Water Based; MPI #161, 163, or 164.
B. Urethane Coating for exposed exterior steel:
1. Number of Coats: Two.
2. Product Characteristics:
   a. Comply with the performance requirements specified above for severe exposure.
3. Top Coat(s): Polyurethane, Two-Component; MPI #72.
   a. Products:
      1) PPG Paints; Pitthane Ultra Polyurethane Enamel, Gloss, 95-8001 Series; MPI #72: www.ppgpaints.com/#sle.
      2) Precision Coatings; PC3 Acrylic Polyurethane Topcoat: www.precisioncoatingsinc.com/#sle.
      4) Substitutions: Section 01 6000 - Product Requirements.
4. Gloss: MPI gloss level 6; use this sheen at all locations.
5. Location: Exposed header beams at main canopy.

2.04 PRIMERS
A. Primers: Provide zinc primers as required or recommended by manufacturer of top coats.
2.05 ACCESSORY MATERIALS
   A. Accessory Materials: Provide primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials as required for final completion of painted surfaces.
   B. Patching Material: Latex filler.
   C. Fastener Head Cover Material: Latex filler.

PART 3 EXECUTION

3.01 PREPARATION
   A. Clean surfaces thoroughly and correct defects prior to application.
   B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
   C. Remove or mask surface appurtenances, including electrical plates, hardware, light fixture trim, escutcheons, and fittings, prior to preparing surfaces for finishing.
   D. Seal surfaces that might cause bleed through or staining of topcoat.
   E. Remove mildew from impervious surfaces by scrubbing with solution of tetra-sodium phosphate and bleach. Rinse with clean water and allow surface to dry.
   F. Galvanized Surfaces:
   G. Ferrous Metal:
      1. Solvent clean according to SSPC-SP 1.
      2. Remove rust, loose mill scale, and other foreign substances using using methods recommended in writing by paint manufacturer and blast cleaning according to SSPC-SP 6 "Commercial Blast Cleaning". Protect from corrosion until coated.

3.02 APPLICATION
   A. Apply products in accordance with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual".
   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. Vacuum clean surfaces of loose particles. Use tack cloth to remove dust and particles just prior to applying next coat.
   E. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.

3.03 CLEANING
   A. Collect waste material that could constitute a fire hazard, place in closed metal containers, and remove daily from site.

3.04 PROTECTION
   A. Protect finishes until completion of project.

3.05 COLOR SCHEDULE
   A. Colors: As indicated on drawings.

END OF SECTION
SECTION 09 9123
INTERIOR PAINTING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Surface preparation.
B. Field application of paints.
C. Scope: Finish interior surfaces exposed to view, unless fully factory-finished and unless otherwise indicated.
D. Do Not Paint or Finish the Following Items:
   1. Items factory-finished unless otherwise indicated; materials and products having factory-applied primers are not considered factory finished.
   2. Items indicated to receive other finishes.
   3. Items indicated to remain unfinished.
   4. Fire rating labels, equipment serial number and capacity labels, bar code labels, and operating parts of equipment.
   5. Floors, unless specifically indicated.
   7. Concealed pipes, ducts, and conduits.

1.02 RELATED REQUIREMENTS

A. Section 01 6116 - Volatile Organic Compound (VOC) Content Restrictions.

1.03 REFERENCE STANDARDS

A. MPI (APL) - Master Painters Institute Approved Products List; Master Painters and Decorators Association; Current Edition.
C. SSPC-SP 1 - Solvent Cleaning; 2015, with Editorial Revision (2016).
D. SSPC-SP 6 - Commercial Blast Cleaning; 2007.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide complete list of products to be used, with the following information for each:
   1. Manufacturer's name, product name and/or catalog number, and general product category (e.g. "alkyd enamel").
   2. MPI product number (e.g. MPI #47).
   3. Cross-reference to specified paint system(s) product is to be used in; include description of each system.
C. Samples: Submit three paper "draw down" samples, 8-1/2 by 11 inches (216 by 279 mm) in size, illustrating range of colors available for each finishing product specified.
   1. Where sheen is specified, submit samples in only that sheen.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified, with minimum three years documented experience.

1.06 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 (7 degrees C) and a maximum of 90 degrees F (32 degrees C), in ventilated area, and as required by manufacturer's instructions.

1.07 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. Provide lighting level of 80 ft candles (860 lx) measured mid-height at substrate surface.

PART 2 PRODUCTS

2.01 MANUFACTURERS
   A. Provide paints and finishes used in any individual system from the same manufacturer; no exceptions. SEE FINISH SCHEDULE FOR ADDITIONAL INFORMATION.
   B. Paints:

2.02 PAINTS AND FINISHES - GENERAL
   A. Paints and Finishes: Ready mixed, unless intended to be a field-catalyzed paint.
      1. Where MPI paint numbers are specified, provide products listed in Master Painters Institute Approved Product List, current edition available at www.paintinfo.com, for specified MPI categories, except as otherwise indicated.
      2. Provide paints and finishes of a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating, with good flow and brushing properties, and capable of drying or curing free of streaks or sags.
      3. Supply each paint material in quantity required to complete entire project's work from a single production run.
      4. Do not reduce, thin, or dilute paint or finishes or add materials unless such procedure is specifically described in manufacturer's product instructions.
   B. Sheens: Provide the sheens specified; where sheen is not specified, sheen will be selected later by Architect from the manufacturer's full line.
   C. Colors: See Finish Schedule.

2.03 PAINT SYSTEMS - INTERIOR
   A. Interior Surfaces to be Painted, Unless Otherwise Indicated: Including gypsum board and shop primed steel.
      1. Two top coats and one coat primer.
      2. Top Coat(s): Interior Latex; MPI #43, 44, 52, 53, 54, or 114.
      3. Top Coat Sheen:
         a. Satin: MPI gloss level 4; use this sheen for items subject to frequent touching by occupants, including door frames and railings.
      4. Primer: As recommended by top coat manufacturer for specific substrate.
   B. Medium Duty Door/Trim: For surfaces subject to frequent contact by occupants, including metals:
      1. Medium duty applications include doors, door frames, railings, handrails, guardrails, and balustrades.
      2. Two top coats and one coat primer.
      3. Top Coat(s): DTM Acrylic.
      4. Top Coat Sheen:
         a. Semi-Gloss: MPI gloss level 5; use this sheen at all locations.
      5. Primer: As recommended by top coat manufacturer for specific substrate.
C. Dry Fall: Metals; exposed structure and overhead-mounted services, including shop primed steel deck, structural steel, metal fabrications, galvanized ducts, galvanized conduit, and galvanized piping.
   1. Shop primer by others.
   2. Top Coat: Alkyd Dry Fall; MPI #55, 89, or 225.
   3. Top Coat Sheen:
      a. Eggshell: MPI gloss level 3; use this sheen at all locations.
   4. Primer: As recommended by top coat manufacturer for specific substrate.

D. Acoustic Sound Panel.
   1. Waterborne Acrylic Dryfall.
   2. Wet mils 3.5-5.0 dry mils 1.5-2.0.
   3. Coverage 336-450 per gallon.
   4. Cross spray at right angles if necessary.
   5. Airless spray or conventional spray per manufacturer’s recommendation.
   6. Indicated surface brush or roller is not allowed.

E. Concrete Floors to be Painted.
   1. Two top coats and one coat primer.
   2. Top Coat(s): Alkyd Floor Enamel, Gloss; MPI #27.
   3. Top Coat Sheen:
      a. Semi-Gloss: MPI gloss level 5; use this sheen at all locations.
   4. Primer: As recommended by top coat manufacturer for specific substrate.

F. Epoxy Coating:
   1. Number of coats: Two.
   2. Product Characteristics:
      a. Comply with the performance requirements specified above for moderate exposure.
   3. Top Coat(s): Polyamide Epoxy; MPI #77.
      a. Sheen: Gloss.
   4. Location: Stairways and Toilet Rooms.

2.04 PRIMERS
   A. Primers: Provide primers as required or recommended by manufacturer of top coats.

2.05 ACCESSORY MATERIALS
   A. Accessory Materials: Provide primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials as required for final completion of painted surfaces.
   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 effect 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. Concrete Floors and Traffic Surfaces: 8 percent.

3.02 PREPARATION
   A. Clean surfaces thoroughly and correct defects prior to application.
B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

C. Remove or mask surface appurtenances, including electrical plates, hardware, light fixture trim, escutcheons, and fittings, prior to preparing surfaces or finishing.

D. Seal surfaces that might cause bleed through or staining of topcoat.

E. Masonry:

F. Concrete Floors and Traffic Surfaces: Remove contamination, acid etch, and rinse floors with clear water. Verify required acid-alkali balance is achieved. Allow to dry.

G. Gypsum Board: Fill minor defects with filler compound. Spot prime defects after repair.

H. Galvanized Surfaces:

I. Ferrous Metal:
   1. Solvent clean according to SSPC-SP 1.
   3. Remove rust, loose mill scale, and other foreign substances using methods recommended in writing by paint manufacturer and blast cleaning according to SSPC-SP 6 "Commercial Blast Cleaning". Protect from corrosion until coated.

J. Metal Doors to be Painted: Prime metal door top and bottom edge surfaces.

3.03 APPLICATION

A. Apply products in accordance with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual".

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 in thicknesses specified by manufacturer.

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. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.

3.04 CLEANING

A. Collect waste material that could constitute a fire hazard, place in closed metal containers, and remove daily from site.

3.05 PROTECTION

A. Protect finishes until completion of project.

END OF SECTION
TEXTURED ACRYLIC FINISHES

PART I GENERAL

1.01 1.01 SUMMARY

A. Basis of Design Dryvit Textured Acrylic Finishes
B. Related Sections
   1. Unit Masonry – Section 04 20 00.
   2. Concrete – Sections 03 30 00 and 03 40 00.
   3. Cold Formed Metal Framing – Section 05 40 00
   4. Wood Framing – Section 06 11 00
   5. Joint Protection – Section 07 90 00
   6. Flashing – Section 07 60 00

1.02 REFERENCES

A. Section Includes:
S. ASTM G 154 Practice for Operating Fluorescent Light Apparatus for UV Exposure of Nonmetallic Materials.

1.03 DEFINITIONS

A. Contractor: The contractor that applies materials to the substrate.
B. Dryvit: Dryvit Systems, Inc., the manufacturer of the coating materials, a Rhode Island corporation.
C. Lamina: The layer consisting of the reinforced base coat and finish materials.
D. Finish: An acrylic based finish, available in a variety of textures and colors, which is applied to the prepared wall surface.
E. Reinforced Base Coat: The layer consisting of fiberglass reinforcing mesh fully embedded in the base coat material applied to the outside surface of the substrate.
F. Reinforcing Mesh: Glass fiber mesh used to reinforce the base coat.
G. Substrate: The material to which Dryvit TAFS are applied.

1.04 1.04 DESCRIPTION

A. Dryvit TAFS are exterior architectural coatings and are available in two configurations:
   1. Dryvit TAFS Option 1 consists of a Dryvit acrylic primer and Dryvit finish applied to various substrates.
   2. Dryvit TAFS Option 2 consists of a Dryvit base coat, Dryvit reinforcing mesh, Dryvit acrylic primer (when specified) and Dryvit acrylic finish applied to various substrates.
B. Design Requirements
   1. Acceptable surfaces for Dryvit Textured Acrylic Finishes include:
      b. Unglazed brick and masonry units.
      c. Cement plaster.
      d. Insulated Concrete Forms (ICF’S) (TAFS Option 2 only) – Refer to Dryvit ICF specification DS194.
      e. EPS surfaced panels (TAFS Option 2 only) meeting ASTM C 578 Type I Properties.
   2. Deflection of substrate systems shall not exceed 1/240 times the span.
   3. Substrate systems shall be designed to meet all local building code requirements and shall be approved for use on this project.
   4. Vapor Retarders – The use and location of vapor retarders within a wall assembly is the responsibility of the project designer and shall comply with local building code requirements. The type and location shall be noted on the project drawings and specifications. Vapor retarders may be inappropriate in certain areas and can result in condensation within the wall assembly. Refer to Dryvit Publication DS159, for additional information.
   5. Projecting surfaces shall have a minimum slope of 6:12 and maximum length of 12 in (305 mm).
   6. The substrate shall be clean, smooth, planar and free of surface imperfections that would interfere with application of a surface coating.
   7. Dryvit texture acrylic finishes (TAFS) are limited to above grade uses.
   8. Dark Colors – For application over EPS, the use of dark colors must be considered in relation to wall surface temperature as a function of local climatic conditions. Use of dark colors in high temperature climates can affect the performance of the EPS substrate.
   9. Sealants
      a. Shall be manufactured and supplied by others.
      b. Shall be compatible with Dryvit TAFS materials. Refer to current Dryvit publication DS153, for listing of sealants tested by sealant manufacturers for compatibility.
      c. The sealant backer rod shall be closed cell.
1.05 SUBMITTALS
   A. Product Data: The contractor shall submit to the owner/architect manufacturer’s product data sheets describing products, which will be used on the project.
   B. Samples: The contractor shall submit to the owner/architect two samples of each finish, texture, and color to be used on the project. The same tools and techniques proposed for the actual installation shall be used to prepare the samples. Samples shall be of sufficient size to accurately represent each color and texture to be utilized on the project.
   C. Test Reports: When requested, the contractor shall submit to the owner/architect copies of selected test reports verifying the performance of the system materials.

1.06 QUALITY ASSURANCE
   A. Qualifications
      1. Manufacturer: Shall be Dryvit Systems, Inc. All materials shall be manufactured or sold by Dryvit and shall be purchased from Dryvit or its authorized distributor.
      2. Contractor: Shall be knowledgeable in the installation of the Dryvit materials and shall be experienced and competent in the application of Dryvit Textured Acrylic Finishes.

1.07 DELIVERY, STORAGE, AND HANDLING
   A. All Dryvit materials shall be delivered to the job site in the original, unopened packages with labels intact.
   B. Upon arrival, materials shall be inspected for physical damage, freezing, or overheating. Questionable materials shall not be used.
      1. Materials shall be stored at the job site, and at all times, in a cool, dry location, out of direct sunlight, protected from weather and other sources of damage. Minimum storage temperature shall be as follows:
         a. DPR, PMR™, HDP™, Weatherlastic® and E™ Finishes, Color Prime™, Primus®, Genesis® and NCB™: 40 °F (4 °C).
         b. For other products, refer to specific product data sheets.
      2. Maximum storage temperature shall not exceed 100 °F (38 °C). NOTE: Minimize exposure of materials to temperatures over 90 °F (32 °C). Finishes exposed to temperatures over 110 °F (43 °C) for even short periods may exhibit skinning, increased viscosity and should be inspected prior to use.
   C. Protect all products from inclement weather and direct sunlight.

1.08 PROJECT CONDITIONS
   A. Environmental Requirements
      1. Application of wet materials shall not take place during inclement weather unless appropriate protection is provided. Protect materials from inclement weather until they are completely dry.
      2. At the time of Dryvit product application, the air and wall surface temperatures shall be from 40 °F (4 °C) minimum to 100 °F (38 °C) maximum for the following products:
         a. DPR, PMR, HDP, Weatherlastic and E Finishes™, Color Prime, Primus, Genesis and NCB.
         b. For other products, refer to specific product data sheets.
      3. These temperatures shall be maintained with adequate air ventilation and circulation for a minimum of 24 hours (48 hours for Weatherlastic Finishes, Ameristone, and TerraNeo) thereafter, or until the products are completely dry. Refer to published product data sheets for more specific information.
1.09 **SEQUENCING AND SCHEDULING**
   A. Installation of the Dryvit Textured Acrylic Finishes shall be coordinated with other construction trades.
   B. Sufficient manpower and equipment shall be employed to ensure a continuous operation, free of cold joints, scaffold lines, texture variations, etc.

1.10 **LIMITED MATERIALS WARRANTY**
   A. Dryvit Systems, Inc. shall provide a written limited materials warranty against defective materials, upon written request. Dryvit shall make no other warranties, expressed or implied. Dryvit is not liable for incidental or consequential damages. Dryvit does not warrant workmanship.
   B. The applicator shall warrant workmanship separately. Dryvit shall not be responsible for workmanship associated with the installation of the Dryvit Textured Acrylic Finishes.

1.11 **DESIGN RESPONSIBILITY**
   A. It is the responsibility of both the specifier and the purchaser to determine if a product is suitable for its intended use. The designer selected by the purchaser shall be responsible for all decisions pertaining to design, detail, structural capability, attachment details, shop drawings, and the like. Dryvit has prepared guidelines in the form of specifications and product data sheets to facilitate the design process only. Dryvit is not liable for any errors or omissions in design, detail, structural capability, attachment details, shop drawings, or the like, whether based upon the information prepared by Dryvit or otherwise, or for any changes which purchasers, specifiers, designers, or their appointed representatives may make to Dryvit’s published comments.

1.12 **MAINTENANCE**
   A. Maintenance and repair shall follow the procedures noted in Dryvit Outsulation System Application Instructions DS204.
   B. All Dryvit products are designed to minimize maintenance. However, as with all building products, depending on location, some cleaning may be required. See Dryvit publication DS152, on Cleaning and Recoating.
   C. Sealants, flashings and other building envelope components shall be inspected on a regular basis and repairs made as necessary.

**PART II PRODUCT**

2.01 **MANUFACTURER**
   A. All Dryvit Textured Acrylic Finishes shall be obtained from Dryvit or its authorized distributors. Substitutions or additions of materials other than specified will void the warranty.

2.02 **MATERIALS**
   A. Portland Cement: Shall be Type I or II, meeting ASTM C 150, white or gray in color, fresh and free of lumps.
   B. Water: Shall be clean and free of foreign matter.

2.03 **COMPONENTS**
   A. Base Coat (when specified) (required with TAFS Option 2 over EPS insulation): Shall be compatible with the substrate and reinforcing mesh(es).
      1. Cementitious: A liquid polymer based material, which is field-mixed in a 1:1 ratio by weight with Portland cement.
         a. Shall be Primus or Genesis.
      2. Ready mixed: A dry blend cementitious, co-polymer based product, field mixed with water.
         a. Shall be NCB.
4. **ShieldIt™**: A 2-pass base coat used over existing EIFS or a Dryvit reinforced base coat to improve impact resistance against woodpeckers when specified.

B. **Reinforcing Mesh(es) (when specified)** (required with TAFS Option 2 over EPS insulation): Shall be a balanced open weave, glass fiber fabric treated for compatibility with other TAFS materials. 
   **NOTE**: Reinforcing meshes are classified by impact resistance and specified by weight and tensile strength as listed in Section 1.04.C.2.
   2. Shall be colored blue for product identification bearing the Dryvit logo.

C. **Primers**
   1. **Color Prime**: Pigmented, acrylic based primer used to improve adhesion and uniformity of finish color.
   2. **Primer with Sand™**: Pigmented acrylic based primer with sand improves adhesion and uniformity of finish color as well as application of trowel-applied finishes.
   3. **Color Prime-W™**: A water based acrylic, semi transparent primer for use over cement plaster and other cementitious substrates. **NOTE**: Because it is semi transparent, tinted colors are affected by the color of the substrate.

D. **Finish**: Shall be the type, color and texture as selected by the architect/owner and shall be one or more of the following:
   1. **Standard DPR (Dirt Pickup Resistance)**: Water-based, acrylic coating with integral color and texture and formulated with DPR chemistry:
      a. **Quarzputz® DPR**: Open-texture
      b. **Sandblast® DPR**: Medium texture
      c. **Freestyle® DPR**: Fine texture
      d. **Sandpebble® DPR**: Pebble texture
      e. **Sandpebble® Fine DPR**: Fine pebble texture.
   2. **Hydrophobic (HDP™) Finishes**: 100% acrylic coating with integral color and texture and formulated with hydrophobic properties:
      a. **Quarzputz® HDP**
      b. **Sandblast® HDP**
      c. **Sandpebble® HDP**
      d. **Sandpebble® Fine HDP**
   3. **Water-based, lightweight acrylic coating with integral color and texture and formulated with DPR chemistry**: 
      a. **Quarzputz® E**
      b. **Sandpebble® E**
      c. **Sandpebble® Fine E**
   4. **Specialty Finishes and Veneers**:
      a. **Ameristone**: Multi-colored quartz aggregate with a flamed granite appearance.
      b. **Stone Mist®**: Ceramically colored quartz aggregate.
      c. **Custom Brick Polymer Finish**: Acrylic polymer-based finish used in conjunction with a proprietary template system to create the look of stone, brick, slate or tile.
      d. **TerraNeo**: 100% acrylic-based finish with large mica chips and multi-colored quartz aggregates.
      e. **NewBrick®**: A lightweight insulated brick veneer for use on exterior walls.
   5. **Elastomeric DPR (Dirt Pickup Resistance)**: Water-based elastomeric acrylic coating with integral color and texture and formulated with DPR chemistry:
      a. **Weatherlastic® Quarzputz**
      b. **Weatherlastic® Sandpebble**
      c. **Weatherlastic® Sandpebble Fine**
      d. **Weatherlastic® Adobe**
   6. **Medallion Series PMR (Proven Mildew Resistance)**: Water-based acrylic coating with integral color and texture and formulated with PMR chemistry:
      a. **Quarzputz® PMR**
b. Sandblast® PMR  
c. Freestyle® PMR  
d. Sandpebble® PMR  
e. Sandpebble® Fine PMR

7. Coatings and Sealers:  
   a. Demandit® Smooth  
   b. Demandit® Sanded  
   c. Demandit® Advantage™  
   d. HDP™ Water-Repellent Coating  
   e. Weatherlastic® Smooth  
   f. Tuscan Glaze™  
   g. SealClear™

PART III EXECUTION

3.01 EXAMINATION

A. Prior to application of Dryvit TAFS, the contractor shall ensure that the substrate is of a type listed in Section 1.04.B.1.

B. Prior to the installation of Dryvit TAFS, the architect or general contractor shall insure that all needed flashings and other waterproofing details have been completed, if such completion is required prior to the application of Dryvit TAFS.

C. The contractor shall notify the general contractor and/or architect and/or owner of all discrepancies. Work shall not proceed until discrepancies have been corrected.

3.02 SURFACE PREPARATION

A. The substrates shall be prepared so as to be free of foreign materials such as oil, dust, dirt, form-release agents, efflorescence, paint, wax, water repellents, moisture, frost and any other materials that inhibit adhesion.

B. Concrete and masonry
   1. Shall be dry and cured a minimum of 28 days.

C. ICF (Insulated Concrete Forms) (TAFS Option 2 is required)  
   1. Refer to ICF Specifications DS194, and ICF Details DS193.  
   2. All gaps between ICF blocks shall be slivered with pieces of EPS.  
   3. The entire surface of the EPS shall be rasped to remove any UV degradation and provide a smooth, level surface for TAFS Option 2.

D. EPS Surfaced Panels (TAFS Option 2 is required)  
   1. EPS shall meet the requirements of ASTM E 2430 and Dryvit specification DS131.  
   2. All gaps between EPS pieces shall be slivered with pieces of EPS.  
   3. The entire surface of the EPS shall be rasped to remove any UV degradation and provide a smooth, level surface for TAFS Option 2.  
   4. EPS shall be properly supported by and attached to the substrate.

E. Cement Plaster  
   1. Plaster shall be dry and cured a minimum of 7 days prior to application of coatings.  
   2. Plaster shall be floated using a wood or hard rubber float to ensure a surface with adequate “tooth” for the finish application. NOTE: Floating to an excessively smooth surface is not recommended and may result in cracking or poor adhesion of the finish coat.

F. Exterior Cement and Calcium Silicate Boards (without joints)  
   1. Board surfaces shall be clean, dry and free of dust or other contaminants.  
   2. All fasteners shall be corrosion resistant and installed in a manner as to be flush with the surface of the board.

G. Painted Surfaces  
   1. Shall be cleaned to remove all loose paint, dirt, dust, chalk, and any other materials that may inhibit adhesion.
2. Glossy surfaces shall be sanded to remove gloss and cleaned.
3. Test patches, located in inconspicuous areas should be prepared to verify adhesion. A minimum of one test every 500 ft² (46 m²) of wall area is recommended.

3.03 INSTALLATION

A. The Dryvit materials shall be mixed and applied in accordance with current Dryvit printed product data sheets.

B. Masonry Surfaces
   1. Apply a continuous layer of Genesis or Genesis DM mixture over the entire wall surface to fill voids and provide a smooth level base for primer and finish application. Application thickness shall not exceed 1/8 in (3 mm) in a single pass.
   2. When specified, a layer of reinforcing mesh is embedded into the wet base coat mixture and troweled smooth.
   3. Allow the base coat mixture to cure a minimum of 24 hours until completely dry. Cool, humid conditions may require longer cure times.
   4. Using a brush, roller, or airless spray equipment, apply a coat of Color Prime or Primer with Sand over the dry base coat surface, and allow to dry.
   5. Apply the specified finish in accordance with Dryvit’s printed installation instructions.

C. ICF (Insulated Concrete Forms) (TAFS Option 2 only)
   1. Refer to printed Dryvit ICF Specifications DS194, and ICF Details DS193.
   2. When specified, high impact meshes shall be installed at ground level, high traffic areas, and other areas exposed to or susceptible to impact damage.

D. Cement Plaster, Poured in Place and Precast Concrete Surfaces
   1. When specified, apply a continuous layer of Genesis or Genesis DM mixture over the entire wall surface to fill small voids and provide a smooth level base for primer and finish application. Application thickness shall not exceed 1/8 in (3 mm) in a single pass.
   2. When specified, a layer of reinforcing mesh is embedded into the wet base coat mixture and troweled smooth.
   3. Allow the base coat to cure a minimum of 24 hours until completely dry. Cool, humid conditions may require longer cure times.
   4. Using a brush, roller, or airless spray equipment, apply a coat of Color Prime or Primer with Sand over the dry base coat or cleaned substrate, and allow to dry.
   5. Apply the specified finish in accordance with Dryvit’s printed installation instructions for the specific finish being used.

E. EPS Surfaced Panels (TAFS Option 2 only)
   1. Dryvit reinforced base coat shall be applied in accordance with current Dryvit Outsulation System Application Instructions DS204.
   2. Apply a continuous layer of base coat and reinforcing mesh over the entire EPS surface in accordance with published instructions for the specific base coat being used.
   3. All EPS terminations shall be encapsulated with reinforced base coat.
   4. When specified, high impact meshes shall be installed at ground level, high traffic areas, and other areas exposed to or susceptible to impact damage.
   5. Allow the base coat mixture to cure a minimum of 24 hours until completely dry. Cool, humid conditions may require longer cure times.
   6. Apply the specified finish in accordance with Dryvit’s printed installation instructions for the specific finish being used.

F. Exterior Cement and Calcium Silicate Boards (without joints)
   1. When specified, apply a continuous layer of Genesis over the sheathing face and embed a layer of reinforcing mesh into the wet base coat mixture such that the entire surface of the board is covered.
   2. Allow the base coat to cure a minimum of 24 hours until completely dry. Cool, humid conditions may require longer cure times.
3. If base coat is not specified, using a brush, roller, or airless spray equipment, apply a coat of Color Prime Color Prime-W, or Primer with Sand over the face of the sheathing board and allow to dry.

4. Apply the finish in accordance with Dryvit’s printed installation instructions for the specified finish.

G. Painted Surfaces
   1. Apply the finish in accordance with Dryvit’s printed installation instructions for the specified finish.
   2. NOTE: It is not recommended to skim painted surfaces with a cementitious base coat material.

H. When specified, the base coat shall be applied such that the overall minimum thickness shall be sufficient to fully embed the mesh. The recommended method is to apply the base coat in two (2) passes.

I. Sealant shall not be applied directly to textured finishes or base coat surfaces. Base coat surfaces which will be in direct contact with sealant shall be coated with Demandit Smooth or Color Prime.

3.04 FIELD QUALITY CONTROL
   A. The contractor shall be responsible for the proper application of Dryvit TAFS.
   B. Dryvit assumes no responsibility for on-site inspections or application of its products.
   C. If required, the contractor shall certify in writing the quality of work performed relative to the substrate system, details, installation procedures, workmanship and as to the specific products used.
   D. If required, the sealant contractor shall certify in writing that the sealant application is in accordance with the sealant manufacturer’s and Dryvit’s recommendations.

3.05 3.05 CLEANING
   A. All excess Dryvit materials shall be removed from the job site by the contractor in accordance with contract provisions and as required by applicable law.
   B. All surrounding areas, where Dryvit TAFS have been installed, shall be left free of debris and foreign substances resulting from the contractor’s work.

3.06 PROTECTION
   A. Dryvit TAFS shall be protected from weather and other sources of damage until dry and permanent protection in the form of flashings, sealants, etc. are installed.

END OF SECTION
SECTION 10 1100
VISUAL DISPLAY UNITS

PART 1 GENERAL

1.01 SECTION INCLUDES
   A. Magnetic, optically clear, ghost-free, shatterproof, resinous markerboards.

1.02 RELATED REQUIREMENTS
   A. Section 09 2116 - Gypsum Board Assemblies: Concealed supports in metal stud walls.

1.03 REFERENCE STANDARDS
   A. ANSI A135.4 - American National Standard for Basic Hardboard; 2012.
   D. ASTM F793/F793M - Standard Classification of Wall Coverings by Use Characteristics; 2015.
   E. PS 1 - Structural Plywood; 2009.

1.04 SUBMITTALS
   A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
   B. Product Data: Provide manufacturer's data on markerboard, tackboard, trim, and accessories.
   C. Shop Drawings: Indicate wall elevations, dimensions, joint locations, special anchor details.
   D. Samples: Submit two samples 8 1/2" by 11" inch (___ by ___ mm) in size illustrating materials and finish, color and texture of markerboard, tackboard, tackboard surfacing, and trim.
   E. Test Reports: Show compliance to specified surface burning characteristics requirements and manufacturer's certification that materials meet specified material attributes, and are suitable for intended application.
   F. Warranty Documentation: Submit manufacturer's standard warranty.
   G. Manufacturer's printed installation instructions.
   H. Maintenance Data: Include data on regular cleaning, stain removal.

1.05 WARRANTY
   A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
   B. Provide life of the building warranty for markerboard to include warranty against discoloration due to cleaning, crazing or cracking, and staining.

PART 2 PRODUCTS

2.01 MANUFACTURERS
   A. Visual Display Boards:

2.02 VISUAL DISPLAY UNITS
   A. Markerboards: _____.
      1. Product Attributes
      2. Ghost-free: impervious to staining from dry-erase, wet-erase and permanent markers.
      3. Weight: 2.44 lbs SF (magnetic).
      4. Thickness: 1/4" (magnetic)
      5. Shatterproof.
      6. Optically clear writing surface.
      7. Permanent opaque color on back.
      8. Sustainability
a. Red List Chemical Free: contains no added urea formaldehyde (NAUF), volatile organic compounds (VOCs), polyvinyl chlorides (PVC) or any other chemical on the Red List (Living Building Challenge - May 2014)
b. Post-Consumer Recycled Content: 33.66% (magnetic)
c. Pre-Consumer Recycled Content: 18.66% (magnetic)
d. Made in America

9. Size: 4’ x 8’
10. Color: Gloss White
11. Surface: Does not absorb inks or stains, eliminates ghosting.
12. Corner Detail
   a. Crown
   b. Markerboard Edge
      1) Manufacturer's (frameless) Brilliance profile.
   c. Style: Magnetic
   d. Note to installer: Where not installed next to tack board, install w/ Trim: 208T-BE, Beveled End caps (silver)

13. Markerboard Orientation
   a. Landscape
   b. Markerboard Setting
      1) Removable
         (a) Provide manufacturer’s proprietary Z-Clip mounting system
      2) Provide manufacturer’s installation manual.

15. Manufacturers:
   a. Mooreco 2E8JX-25 Sharewall, moorecoinc.com/sharewall 
   b. Substitutions: See Section 01 6000 - Product Requirements.

2.03 MATERIALS
A. Porcelain Enamed Steel Sheet: ASTM A424/A424M, Type I, Commercial Steel, with fired-on vitreous finish.
B. Vinyl Coated Fabric: ASTM F793/F793M Category IV.
C. Plywood: PS 1, Grade C-D, softwood.
D. Hardboard for Cores: ANSI A135.4, Class 1 - Tempered, S2S (smooth two sides).
E. Fiber Board: ASTM C208, cellulosic fiber board.
F. Steel Sheet Backing: 28 gage, 0.0149 inch (0.38 mm), galvanized.
G. Adhesives: Type used by manufacturer.

2.04 ACCESSORIES
A. Map Rail: Extruded aluminum, manufacturer's standard profile, with cork insert and runners for accessories; 1 inch (25 mm) wide overall, full width of frame.
B. Map Supports: Formed aluminum sliding hooks, roller brackets, and provide 1 for each 2' of rail to fit map rail.
C. Temporary Protective Cover: Sheet polyethylene, 8 mil (0.2 mm) thick.
D. Flag Holders: Cast aluminum bored to receive 1 inch (25 mm) diameter flag staff, bracketed to fit top rail of board.
E. Marker Tray: Aluminum, manufacturer's standard profile, one piece full length of markerboard, molded ends, concealed fasteners, same finish as frame.
F. Mounting Brackets: 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. Secure units level and plumb.
C. Butt Joints: Install with tight hairline joints.
D. Install tackable wall panels in accordance with manufacturer's recommendations on specified substrates with concealed attachments.

### 3.03 CLEANING

A. Clean board surfaces in accordance with manufacturer's instructions.
B. Cover with protective cover, taped to frame.
C. Remove temporary protective cover at Date of Substantial Completion.

END OF SECTION
SECTION 10 1124
TACKABLE WALL SYSTEMS

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Site fabricated, tackable wall system.
B. Accessories as required for complete installation.

1.02 RELATED REQUIREMENTS
A. Section 01 6116 - Volatile Organic Compound (VOC) Content Restrictions.
B. Section 10 1100 - Visual Display Units: Prefabricated, framed tackboards and markerboards.

1.03 REFERENCE STANDARDS
C. PS 2 - Performance Standard for Wood-Based Structural-Use Panels; 2010.

1.04 SUBMITTALS
A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Product Data: Manufacturer's data sheets on each product to be used, including:
   1. Preparation instructions and recommendations.
   2. Storage and handling requirements and recommendations.
   3. Installation methods.
   4. Specimen warranty.
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 (200 mm) square, representing actual product in color, texture, and pattern.
   2. Actual samples of all track profiles to be employed, including transitions between dissimilar profiles.
   3. Tackable core backing material, minimum 12 inches (300 mm) square.
E. Test Reports: Certified test data from an independent test agency verifying that wall systems meet specified requirements for fire performance.
F. Warranty: Submit manufacturer's 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 6000 - Product Requirements, for additional provisions.
   2. Extra Accessories: Quantity equal to 10 percent of total installed, of each type.

1.05 QUALITY ASSURANCE
A. Installer Qualifications: Firm specializing in site-fabricated wall systems, with not less than five years of documented experience in installing wall systems of the type specified, and approved by the manufacturer.
B. 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. Store products in manufacturer's unopened packaging until ready for installation.
   B. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

1.07 FIELD CONDITIONS
   A. 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 WARRANTY
   A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

PART 2 PRODUCTS

2.01 MANUFACTURERS
   A. Tackable Wall Systems:
      2. Substitutions: See Section 01 6000 - Product Requirements.

2.02 TACKABLE WALL SYSTEM
   A. Tackable Wall System: Site-installed tackable wall panel, writing surface panel, plywood system panel on OSB board attached to studs. Some areas are designed to permit removal and replacement of individual panels without affecting adjacent panels. Other areas are to be permenantly installed as shown on the architectural
      1. Surface Burning Characteristics: Flame Spread Index of 25, maximum; Smoke Developed Index of 450, maximum; when whole system is tested in accordance with ASTM E84 using mounting specified in ASTM E2573 for stretched systems.

   B. Verify that all adhesives and sealants employed in installation of tackable wall systems are low-emission types, with low VOC ratings.

2.03 MATERIALS
   A. Wall Sheathing: Oriented strand board wood structural panel; PS 2.
      1. Grade: Structural 1 Sheathing.
      2. Bond Classification: Exposure 1.
      3. Performance Category: 1/2 PERF CAT.
      5. Edges: Square.
   
   B. Tackwall panel: Forbo Tackable Wall Surface, 1/2" thick, square edges, 1.5 lb/sq. ft., in 48" x 90" rolls.
   
   C. Writing surface: Markerboard per specification section 10 1101, 1/2" thick.
   
   D. Hardwood Plywood: Face species maple, plain sawn, running matched, 1/2" medium density fiberboard core; HPVA HP-1, Front Face Grade AA, Back Face Grade 1, glue type as recommended for application.
   
   E. Trim around perimeter of each panel to be Schluter "Jolley" trim.
   
   F. Base: 5/8 inch x 4 inch gypsum board with rubber base as specified in 09 6500 Resilient Flooring.
   
   G. Fasteners: At interchangeable surfaces fasteners to be exposed surface mount. At writeable / tackable walls fasteners to be concealed.
   
   H. Adhesives: Low VOC or water-based, approved by wall system manufacturer, and complying with requirements of Section 01 6116.
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 and in accordance with approved shop
      drawings, complying with manufacturer's instructions.

3.04 CLEANING
   A. Clean exposed surfaces of tackable 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
SECTION 10 1400
SIGNAGE

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Room and door signs.
B. Building identification signs.
C. Plaque.

1.02 RELATED REQUIREMENTS
A. Section 26 5100 - Interior Lighting: Exit signs required by code.

1.03 REFERENCE STANDARDS

1.04 SUBMITTALS
A. See Section 01 3000 - 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 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. Manufacturer's Installation Instructions: Include installation templates and attachment devices.
G. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 01 6000 - 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.
B. Package room and door signs in sequential order of installation, labeled by floor or building.
C. Store tape adhesive at normal room temperature.

1.07 FIELD CONDITIONS
A. Do not install tape adhesive when ambient temperature is lower than recommended by manufacturer.
B. Maintain this minimum temperature during and after installation of signs.
PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Flat Signs:
   4. Innerface Sign Systems; www.innerface-signage.com
   5. Mohawk Sign Systems; www.mohawksign.com
   6. Vomar Products; www.vomarproducts.com
   7. Substitutions: See Section 01 6000 - Product Requirements.

B. Dimensional Letter Signs:
   5. Substitutions: See Section 01 6000 - Product Requirements.

C. Plaques:
   5. Mohawk Sign Systems; www.mohawksign.com
   6. Substitutions: See Section 01 6000 - Product Requirements.

2.02 SIGNAGE APPLICATIONS

A. Accessibility Compliance: Signs are required to comply with ADA Standards and ICC A117.1 2017, unless otherwise indicated; in the event of conflicting requirements, comply with the most comprehensive and specific requirements.

B. Room and Door Signs: Provide a sign for every doorway, whether it has a door or not, not including corridors, lobbies, and similar open areas.
   1. Sign Type: Flat signs with engraved panel media as specified.
   2. Provide “tactile” signage, with letters raised minimum 1/32 inch (0.8 mm) and Grade II braille.
   3. Office and Classroom: Identify with room numbers to be determined later, not the numbers indicated on drawings; in addition, provide “window” section for replaceable occupant name.
   4. Conference and Meeting Rooms: Identify with room numbers to be determined later, not the numbers indicated on drawings; in addition, provide “window” section with sliding "In Use/Vacant" indicator.
   5. Service Rooms: Identify with room names and numbers to be determined later, not those indicated on drawings.
   6. Rest Rooms: Identify with pictograms, the names "MEN" and "WOMEN", and braille.

C. Building Identification Signs:
   1. Use individual metal letters.
   2. Mount on outside wall in location indicated on drawings.

D. Plaque: See Allowance for details.

2.03 SIGN TYPES

A. Flat Signs: Signage media without frame.
   1. Edges: Square.
   2. Corners: Radiused.
   3. Clear Cover: For customer produced sign media, provide clear cover of polycarbonate plastic, glossy on back, non-glare on front.

B. Color and Font: Unless otherwise indicated:
   1. Character Font: Helvetica, Arial, or other sans serif font.
   2. Character Case: Upper case only.
   3. Background Color: manufactures full range of colors.

2.04 TACTILE SIGNAGE MEDIA
   A. Engraved Panels: Laminated colored plastic; engraved through face to expose core as background color:
      1. Total Thickness: 1/16 inch (1.6 mm).

2.05 PLAQUES
   A. Metal Plaques:
      1. Metal: Aluminum casting.
      2. Metal Thickness: 1/8 inch (3 mm), minimum.

2.06 DIMENSIONAL LETTERS
   A. Metal Letters:
      1. Metal: Aluminum casting.
      2. Finish: Brushed, satin.

2.07 ACCESSORIES
   A. Concealed Screws: Stainless steel, galvanized steel, chrome plated, or other non-corroding metal.
   B. Tape Adhesive: Double sided tape, permanent adhesive.

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 and mount at heights indicated on drawings and in accordance with ADA Standards and ICC A117.1.
   D. Protect from damage until Substantial Completion; repair or replace damaged items.

3.03 SIGNAGE SCHEDULE
   A. See Finish Plans for location of all signs.

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<td>B</td>
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### 3.04 SIGNAGE GRAPHICS

A. See attached signage graphics after the end of this section.

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<td>MAIN OFFICE</td>
</tr>
<tr>
<td>G41</td>
<td>C2</td>
<td>MEDIA CENTER</td>
</tr>
<tr>
<td>G42</td>
<td>C2</td>
<td>RESOURCE</td>
</tr>
<tr>
<td>G43</td>
<td>C2</td>
<td>TEACHER WORKROOM</td>
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<tr>
<td>G44</td>
<td>C2</td>
<td>FACULTY</td>
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<tr>
<td>G45</td>
<td>E</td>
<td>BOYS</td>
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<tr>
<td>G46</td>
<td>F</td>
<td>GIRLS</td>
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<tr>
<td>G47</td>
<td>G</td>
<td>FACULTY RESTROOM</td>
</tr>
<tr>
<td>G48</td>
<td>G</td>
<td>TOILET ROOM</td>
</tr>
<tr>
<td>G49</td>
<td>H</td>
<td>DEDICATION PLAQUE - BY OWNER/ARCHITECT (15&quot; X 23&quot;) - CAST ALUMINUM</td>
</tr>
<tr>
<td>G50</td>
<td>J</td>
<td>COOLER</td>
</tr>
<tr>
<td>G51</td>
<td>J</td>
<td>FREEZER</td>
</tr>
<tr>
<td>G52</td>
<td>J</td>
<td>ROOF ACCESS</td>
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<tr>
<td>G53</td>
<td>J</td>
<td>FIRE RISER</td>
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<tr>
<td>G54</td>
<td>J</td>
<td>MECHANICAL</td>
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<tr>
<td>G55</td>
<td>J</td>
<td>KITCHEN RECEIVING</td>
</tr>
<tr>
<td>G56</td>
<td>K</td>
<td>THIS IS NOT AN ENTRANCE ALL VISITORS ARE REQUIRED TO CHECK IN AT THE MAIN OFFICE THROUGH THE NORTH MAIN ENTRANCE</td>
</tr>
<tr>
<td>G57</td>
<td>K</td>
<td>THIS IS NOT AN ENTRANCE</td>
</tr>
<tr>
<td>G58</td>
<td>L</td>
<td>ELLIS ELEMENTARY [ALUMINUM 24&quot; H x 3&quot; D, Font: Swis721 Blk BT]</td>
</tr>
<tr>
<td>G59</td>
<td>M</td>
<td>CONSTRUCTION SIGN - SEE SHEET C-503 FOR LOCATION, C-001 FOR GRAPHIC (4’ x 8’)</td>
</tr>
<tr>
<td>G60</td>
<td>N</td>
<td>IN EVENT OF FIRE USE STAIR</td>
</tr>
<tr>
<td>G61</td>
<td>D</td>
<td>MAXIMUM OCCUPANCY</td>
</tr>
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</table>

**NOTE: SIGN TYPE WITH A NUMBER 2 (EXAMPLE C2) SIGNIFIES A GLASS MOUNT WITH A BLANK ON THE OPPOSITE SIDE OF GLASS**
<table>
<thead>
<tr>
<th>SIGN</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>ROOM NAME CHANGEABLE INSERT SIGN 6” X 6”</td>
</tr>
<tr>
<td>B</td>
<td>MESSAGE SIGN WITH CHANGEABLE INSERT 6” X 4”</td>
</tr>
<tr>
<td>C</td>
<td>MESSAGE SIGN 6” X 3”</td>
</tr>
<tr>
<td>D</td>
<td>MAXIMUM OCCUPANCY SIGN 6” X 4”</td>
</tr>
<tr>
<td>E</td>
<td>WORD &amp; PICTURE SIGN – BOY’S 6” X 7 3/4”</td>
</tr>
<tr>
<td>F</td>
<td>WORD &amp; PICTURE SIGN – GIRLS 6” X 7 3/4”</td>
</tr>
<tr>
<td>G</td>
<td>WORD &amp; PICTURE SIGN RESTROOM TO READ FACULTY AT ALL FACULTY RESTROOMS 6” X 7 3/4”</td>
</tr>
<tr>
<td>H</td>
<td>CAST BRONZE PLAQUE – TEXT TO BE PREPARED BY ARCHITECT – APPROVED BY OWNER 15” X 23”</td>
</tr>
<tr>
<td>J</td>
<td>VINYL LETTERS 3” HIGH – SEE SCHEDULE FOR TEXT</td>
</tr>
<tr>
<td>K</td>
<td>VINYL LETTERS 1” HIGH – SEE SCHEDULE FOR TEXT</td>
</tr>
<tr>
<td>L</td>
<td>ALUMINUM CAST OR CHANNEL LETTERS</td>
</tr>
<tr>
<td>M</td>
<td>CONSTRUCTION SIGN 4’ X 8’ MINIMUM – GRAPHIC BY ARCHITECT</td>
</tr>
<tr>
<td>N</td>
<td>IN CASE OF FIRE DO NOT USE ELEVATOR USE STAIRS 6” X 6”</td>
</tr>
</tbody>
</table>
SECTION 10 2113.17
PHENOLIC TOILET COMPARTMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Phenolic Core - Plastic Laminate Faced Toilet Compartments.

1.02 REFERENCE STANDARDS
A. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2015.
C. NEMA LD-3 - High Pressure Decorative Laminates

1.03 ADMINISTRATIVE REQUIREMENTS
A. Coordination: Coordinate the work with placement of support framing and anchors in walls and ceilings.

1.04 SUBMITTALS
A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide data on panel construction, hardware, and accessories.
C. Shop Drawings: Indicate partition plan, elevation views, dimensions, details of wall supports, door swings.
D. Manufacturer's Installation Instructions: Indicate special procedures.

PART 2 PRODUCTS

2.01 MANUFACTURERS
A. Phenolic Toilet Compartments:
   1. Scranton Products, Hiny Hiders

2.02 PHENOLIC TOILET COMPARTMENTS
A. Toilet Compartments: Factory fabricated solid phenolic panels of multiple layers of phenolic resin impregnated Kraft paper compressed under heat and pressure. Face with high pressure high pressure plastic laminate surface sheet fusion welded to surface of core. Edges: Black, polished and free of sharp edges. Factory fabricated doors, pilasters, and divider panels made of solid phenolic core panels with integral plastic laminate finish, floor-mounted headrail-braced.
B. Doors:
   1. Thickness: 3/4 inch (19 mm).
   2. Width: 24 inch (610 mm).
   3. Width for Handicapped Use: 36 inch (915 mm), out-swinging, self-closing.
   4. Height: 58 inch (1473 mm).
C. Panels:
   1. Thickness: 1/2 inch (13 mm).
   2. Height: 66 inch (1676 mm).
   3. Depth: As indicated on drawings.
D. Pilasters:
   1. Thickness: 3/4 inch (19 mm).
   2. Width: As required to fit space; minimum 3 inch (76 mm).

2.03 ACCESSORIES
A. Pilaster Shoes: Formed ASTM A666, Type 304 stainless steel with No. 4 finish, 3 inch (76 mm) high, concealing floor fastenings.
B. Head Rails: Hollow anodized aluminum, 1 inch by 1-1/2 inch (25 mm by 38 mm) size, with anti-grip profile and cast socket wall brackets.

C. Wall and Pilaster Brackets: Polished stainless steel; manufacturer's standard type for conditions indicated on drawings.

D. Attachments, Screws, and Bolts: Stainless steel, tamper proof type.
   1. For attaching panels and pilasters to brackets: Through-bolts and nuts; tamper proof.

E. Hardware: Polished stainless steel:
   1. Hinges: Self-closing type that can be adjusted to hold door open at any angle up to 90 degrees. Provide full height, continuous piano type door hinge of extruded aluminum, 6063-T5, bright anodized finish or Type 304, 16 gauge satin-finish stainless steel. Knuckles shall have nylon separators. Pivot pin shall be ¼" type 304 stainless steel. Hinge shall be predrilled for stainless steel tamper proof bolts, spaced at maximum 8” on center. Provide snap on cover over fasteners, attached at top and bottom with theft proof fasteners.
   2. Door Latch: Slide type with exterior emergency access feature.
   3. Door strike and keeper with rubber bumper; mounted on pilaster in alignment with door latch.
   4. Coat hook with rubber bumper; one per compartment, mounted on door.
   5. Provide door pull for outswinging doors.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install partitions secure, rigid, plumb, and level in accordance with manufacturer's instructions.

B. Maintain 3/8 inch to 1/2 inch (9 mm to 13 mm) 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. Locate head rail joints at pilaster center lines.

E. Field touch-up of scratches or damaged finish will not be permitted. Replace damaged or scratched materials with new materials.

END OF SECTION
SECTION 10 2239
FOLDING PANEL PARTITIONS

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Top-supported operable panel partitions, vertical opening, electrical operation.

1.02 RELATED REQUIREMENTS
A. Section 26 0533.13 - Conduit for Electrical Systems: Empty conduit from partition motor controller to disconnect and from motor controller to control buttons.

1.03 REFERENCE STANDARDS
F. ASTM E413 - Classification for Rating Sound Insulation; 2016.
H. NEMA MG 1 - Motors and Generators; 2017.
I. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

1.04 SUBMITTALS
A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide data on partition materials, operation, hardware and accessories, electric operating components, and colors and finishes available.
C. Shop Drawings: Indicate opening sizes, track layout, details of track and required supports, static and dynamic loads, location and details of pass door and frame, adjacent construction and finish trim, and stacking depth.
D. Samples for Selection: Submit two samples of full manufacturer's color range for selection of colors.
E. Samples for Review: Submit two samples of surface finish, 12 by 12 inches (300 by 300 mm) size, illustrating quality, colors selected, texture, and weight.
F. Certificates: Certify that partition system meets or exceeds specified acoustic requirements.
G. 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 the type specified and with at least three years of documented experience.
1.06 DELIVERY, STORAGE, AND HANDLING
A. Store products in manufacturer's unopened packaging until installation.

1.07 WARRANTY
A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
B. Correct defective Work within five year period after Date of Substantial Completion.
C. Provide 5,000 cycles or 2 year (which ever comes first) manufacturer warranty against defects in material and workmanship, excluding abuse.

PART 2 PRODUCTS

2.01 MANUFACTURERS
A. Operable Panel Partitions - Vertical Opening:
   2. Substitutions: See Section 01 6000 - Product Requirements.

2.02 OPERABLE PANEL PARTITIONS - VERTICAL OPENING
A. Operable Panel Partition: Vertical opening; individual panels stacked in drive box above ceiling; motor operated.
B. Panel Construction:
   1. Frame: 16 gage, 0.0598 inch (1.52 mm) thick formed sheet steel frame top, bottom, jambs, and intermediates; welded construction, with acoustical insulation fill.
   2. Panel Substrate Facing: Steel sheet, ___ gage, ___ inch (____ mm) thick.
C. Panel Finishes:
   2. Exposed Metal Trim: Custom powder coated paint finish.
D. Panel Seals:
   1. Panel to Panel Seals: Tongue and groove configuration, color to match panel finish.
   2. Horizontal Bottom Seal: Retractable safety sensor seal providing minimum of 2 inches (51 mm) floor adjustability to accommodate out-of-level floors.
E. Suspension System:
   1. Guide Rails: Extruded aluminum; 6 inches (152 mm) wide and 6 inches (152 mm) deep.
   3. Drive Box: Hardened steel construction.
      a. Supports weight of panels in stacked position.
F. Performance:
   1. Acoustic Performance:
      a. Sound Transmission Class (STC): 60 calculated in accordance with ASTM E413, based on tests conducted in accordance with ASTM E90, on panel size of 100 sq ft (9.3 sq m).
   2. Surface Burning Characteristics of Panel Finish: Flame spread/smoke developed index of 25/50, maximum, when tested in accordance with ASTM E84.
   3. Installed partition system track capable of supporting imposed loads, with maximum deflection of 1/360 of span.
   4. Seismic Performance: Operable partition shall withstand effects of earthquake motions determined according to ASCE 7.
G. Operation:
   1. Electric Operator: 5 to 10 feet per minute (1-1/2 to 3 meters per minute) vertical traveling speed.
      a. Drive system includes drive shafts, couplers, torque limiter, key pressure actuation control station wired in series, dual drive emergency operation and all necessary equipment for electric operation.
b. Chain drive attaches to dual direction lead panel.
c. Motor: NEMA MG 1,.

2. Control Station: One standard keyed switch (RESET-OFF-ON) and one two-position (OPEN-CLOSE, constant pressure) type rocker switch; 24 volt circuit; surface mounted.
   a. Master key switch prepared for mortise lock cylinder.
   b. Key switches alike.

3. Safety Features:
   a. Load Arrestor: Stops free fall occurrence.
   b. Entrapment Backup System: Automatically reverses downward movement when lead edge makes contact with obstruction within path of travel.
   c. Safety Monitor Switches: Automatically shuts off power to motor drives if failure occurs.
   d. Limit Switches: Automatic type, at both extremes of travel, to prevent over-travel.
   e. Emergency Release: Mechanism to disengage motor drive system and permit manual operation.

4. Electrical Requirements:
   a. 5 HP Motor: 60 Hz and 200-240 volt 3 phase.
   b. Motor drive shall be sized properly for wall operation over 10,000 cycle design.
   c. Conduit and Outlet Boxes: Surface type in accordance with Section 26 0533.13.
   d. 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.
   e. Disconnect Switch: Factory mount disconnect switch in control panel.

5. Operation Sequence:
   a. Stack/Store Panels: Panels are retracted above ceiling and stored by activating key-switch control.
   b. Extend Partition: When operable wall is being lowered (closed), panels stop and retract if leading (bottom) edge comes in contact with any object between it and floor. Operation of wall may resume once key switch has been reset and obstruction cleared.

2.03 MATERIALS
   A. Aluminum Extrusions: ASTM B221 (ASTM B221M), 6063 alloy, T6 temper.
   B. Markerboard: Porcelain enamel on steel, laminated to core; color as selected.
   C. Acoustic Insulation:
      1. Type: As required for acoustic performance indicated.
      2. Thickness: As required for acoustic performance indicated.

PART 3 EXECUTION

3.01 EXAMINATION
   A. Verify that field measurements are as indicated.
   B. Verify that required utilities are available, of the correct characteristics, in proper location, and ready for use.
   C. Verify track supports are laterally braced and will permit track to be level within 1/4 inch (6.4 mm) of required position and parallel to the floor surface.
   D. Verify floor flatness of 1/8 inch in 10 feet (3 mm in 3 m), non-cumulative.
   E. Verify wall plumbness of 1/8 inch in 10 feet (3 mm in 3 m), non-cumulative.

3.02 INSTALLATION
   A. Install partition in accordance with manufacturer’s instructions and ASTM E557.
   B. Install electric operator, wiring, and controls. Locate control station(s) as indicated.
   C. Fit and align partition assembly level and plumb.
   D. Lubricate moving components.
E. Install acoustic sealant to achieve required acoustic performance.
F. Coordinate electrical connections.

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. Demonstrate operation of partition and identify potential operational problems.

END OF SECTION
SECTION 10 2600
WALL AND DOOR PROTECTION

PART 1  GENERAL
1.01  SECTION INCLUDES
   A. Corner guards.

1.02  REFERENCE STANDARDS

1.03  SUBMITTALS
   A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
   B. Product Data: Indicate physical dimensions and anchorage details.
   C. Samples: Submit samples illustrating component design, configurations, joinery, color and finish.
      1. Submit two sections of corner guards, 24 inches (610 mm) long.
   D. Manufacturer's Instructions: Indicate special procedures, perimeter conditions requiring special attention.
   E. Warranty Documentation: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.
   F. Maintenance Materials: Furnish the following for Owner's use in maintenance of project:
      1. See Section 01 6000 - Product Requirements, for additional provisions.
      2. Extra Stock Materials: Two of each kind of minimum 48 inches (_______ mm) long unit of each kind of covers for corner guards.
   G. Maintenance Data: For each type of product. Include information regarding recommended and potentially detrimental cleaning materials and methods.

1.04  DELIVERY, STORAGE, AND HANDLING
   A. Deliver wall and door protection items in original, undamaged protective packaging. Label items to designate installation locations.
   B. Store products in either horizontal or vertical position, in conformance with manufacturer's instructions.

1.05  WARRANTY
   A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
   B. Correct defective Work within a one year period after Date of Substantial Completion.
   C. Provide five year manufacturer and installer warranty for metal corner guards.

PART 2  PRODUCTS
2.01  MANUFACTURERS
   A. Corner Guards:
      4. Substitutions: See Section 01 6000 - Product Requirements.
2.02 PERFORMANCE CRITERIA
   A. Impact Strength: Unless otherwise noted, provide protection products and assemblies that have been successfully tested for conformance to applicable provisions of ASTM D256 and/or ASTM F476.

2.03 PRODUCT TYPES
   A. Corner Guards - Surface Mounted:
      1. Material: Type 304 stainless steel, No. 4 finish, _______ gage, .0625 inch (______ mm) thick.
      2. Performance: Resist lateral impact force of 100 lbs (445 N) at any point without damage or permanent set.
      3. Width of Wings: 2 inches (51 mm).
      5. Length: One piece of 48 inches high.

   B. Adhesives and Primers: As recommended by manufacturer.

2.04 SOURCE QUALITY CONTROL
   A. See Section 01 4000 - Quality Requirements, for additional requirements.

PART 3 EXECUTION

3.01 EXAMINATION
   A. Verify that rough openings, concealed blocking, and anchors are correctly sized and located.
   B. Verify that field measurements are as indicated on drawings.
   C. Verify that substrate surfaces for adhered items are clean and smooth.
      1. Test painted or wall covering surfaces for adhesion in inconspicuous area, as recommended by manufacturer. Follow adhesive manufacturer's recommendations for remedial measures at locations and/or application conditions where adhesion test's results are unsatisfactory.
   D. Start of installation constitutes acceptance of project conditions.

3.02 INSTALLATION
   A. Install components in accordance with manufacturer's instructions, level and plumb, secured rigidly in position to supporting construction.
   B. Position corner guard 4 inches (102 mm) above finished floor to 52 inches high (______ mm high).

3.03 TOLERANCES
   A. Maximum Variation From Required Height: 1/4 inch (6 mm).

3.04 CLEANING
   A. Clean wall and door protection items of excess adhesive, dust, dirt, and other contaminants.

END OF SECTION
SECTION 10 2800
TOILET, BATH, AND LAUNDRY ACCESSORIES

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Commercial toilet accessories.
B. Utility room accessories.

1.02 RELATED REQUIREMENTS
A. Section 09 2116: Concealed supports for accessories, including in wall framing and plates.
B. Section 22 4000 - Plumbing Fixtures: Under-lavatory pipe and supply covers.

1.03 REFERENCE STANDARDS
D. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2015.

1.04 ADMINISTRATIVE REQUIREMENTS
A. Coordinate the work with the placement of internal wall reinforcement, concealed ceiling supports, and reinforcement of toilet partitions to receive anchor attachments.

1.05 SUBMITTALS
A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Product Data: Submit data on accessories describing size, finish, details of function, and 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.

PART 2 PRODUCTS

2.01 MANUFACTURERS
A. Commercial Toilet, Shower, and Bath Accessories:
   4. Substitutions: Section 01 6000 - Product Requirements.

2.02 MATERIALS
A. Accessories - General: Shop assembled, free of dents and scratches and packaged complete with anchors and fittings, steel anchor plates, adapters, and anchor components for installation.
   1. Grind welded joints smooth.
2. Fabricate units made of metal sheet of seamless sheets, with flat surfaces.
   
   B. Keys: Provide 2 keys for each accessory to Owner; master key lockable accessories.
   
   C. Stainless Steel Sheet: ASTM A666, Type 304.
   
   D. Stainless Steel Tubing: ASTM A269/A269M, Grade TP304 or TP316.
   
   
   F. Zinc Alloy: Die cast, ASTM B86.
   
   G. Mirror Glass: Annealed float glass, ASTM C1036 Type I, Class 1, Quality Q2, with silvering, protective and physical characteristics complying with ASTM C1503.
   
   H. Adhesive: Two component epoxy type, waterproof.
   
   I. Fasteners, Screws, and Bolts: Hot dip galvanized; tamper-proof; security type.
   
   J. Expansion Shields: Fiber, lead, or rubber as recommended by accessory manufacturer for component and substrate.

2.03 FINISHES

A. Stainless Steel: Satin finish, unless otherwise noted.
   
   B. Chrome/Nickel Plating: ASTM B456, SC 2, polished finish, unless otherwise noted.
   
   C. Baked Enamel: Pretreat to clean condition, apply one coat primer and minimum two coats epoxy baked enamel.
   
   D. Galvanizing for Items Other than Sheet: Comply with ASTM A123/A123M; galvanize ferrous metal and fastening devices.
   
   E. Shop Primed Ferrous Metals: Pretreat and clean, spray apply one coat primer and bake.
   
   F. Back paint components where contact is made with building finishes to prevent electrolysis.

2.04 COMMERCIAL TOILET ACCESSORIES

A. Toilet Paper Dispenser: Owner furnished, Contractor installed.
   
   B. Paper Towel Dispenser: Owner furnished, Contractor installed.
   
   C. Soap Dispenser: Owner furnished, Contractor installed.
   
   D. Mirrors: Stainless steel framed, 1/4 inch (6 mm) thick annealed float glass; ASTM C1036.
      1. Annealed Float Glass: Silvering, protective and physical characteristics in compliance with ASTM C1503.
      2. Size: as shown on the drawings.
      3. Frame: 0.05 inch (1.3 mm) angle shapes, with mitered and welded and ground corners, and tamperproof hanging system; satin finish.
      4. Backing: Full-mirror sized, minimum 0.03 inch (0.8 mm) galvanized steel sheet and nonabsorptive filler material.
   
   E. Grab Bars: Stainless steel, smooth surface.
      1. Heavy Duty Grab Bars: Floor supports are not acceptable.
         a. Push/Pull Point Load: Minimum 1000 pound-force (4448.2 N), minimum.
         b. Dimensions: 1-1/2 inch (38 mm) outside diameter, minimum 0.125 inch (3.17 mm) wall thickness, exposed flange mounting, 1-1/2 inch (38 mm) clearance between wall and inside of grab bar.
         c. Length and Configuration: As indicated on drawings.
   
   F. Sanitary Napkin Disposal Unit: Owner furnished, Contractor installed.

2.05 UNDER-LAVATORY PIPE AND SUPPLY COVERS

A. Specified in 22 4000 - Plumbing Fixtures.
2.06 UTILITY ROOM ACCESSORIES
   A. Mop and Broom Holder: 0.05 inch (1.3 mm) thick stainless steel, Type 304, hat-shaped channel.

PART 3 EXECUTION

3.01 EXAMINATION
   A. Verify existing conditions before starting work.
   B. Verify exact location of accessories for installation.
   C. Verify that field measurements are as indicated on drawings.

3.02 PREPARATION
   A. Deliver inserts and rough-in frames to site for timely installation.
   B. Provide templates and rough-in measurements as required.

3.03 INSTALLATION
   A. Install accessories in accordance with manufacturers’ instructions in locations indicated on drawings.
   B. Install plumb and level, securely and rigidly anchored to substrate.
   C. Mounting Heights: As required by accessibility regulations, unless otherwise indicated.
      1. Grab Bars: As indicated on drawings.
      2. Other Accessories: As indicated on drawings.

3.04 PROTECTION
   A. Protect installed accessories from damage due to subsequent construction operations.

END OF SECTION
SECTION 10 4400
FIRE PROTECTION SPECIALTIES

PART 1  GENERAL
1.01 SECTION INCLUDES
A. Fire extinguishers.
B. Fire extinguisher cabinets.
C. Accessories.

1.02 RELATED REQUIREMENTS
A. Section 09 2116 Gypsum Board Assemblies: Roughed-in wall openings.

1.03 REFERENCE STANDARDS
D. UL (DIR) - Online Certifications Directory; Current Edition.

1.04 SUBMITTALS
A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide extinguisher operational features.
C. Shop Drawings: Indicate locations of cabinets and cabinet physical dimensions.
D. Manufacturer's Installation Instructions: Indicate special criteria and wall opening coordination requirements.
E. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

1.05 FIELD CONDITIONS
A. Do not install extinguishers when ambient temperature may cause freezing of extinguisher ingredients.

PART 2  PRODUCTS
2.01 MANUFACTURERS
A. Fire Extinguishers:
   1. Ansul, a Tyco Business; www.ansul.com/#sle.
   3. JL Industries; www.jlindustries.com
   5. Substitutions: See Section 01 6000 - Product Requirements.
B. Fire Extinguisher Cabinets and Accessories:
   1. Ansul, a Tyco Business; www.ansul.com/#sle.
   4. Substitutions: See Section 01 6000 - Product Requirements.

2.02 FIRE EXTINGUISHERS
A. Fire Extinguishers - General: Comply with product requirements of NFPA 10 and applicable codes, whichever is more stringent.
   1. Provide extinguishers labeled by UL (DIR) or FM (AG) for purpose specified and as indicated.
B. Multipurpose Dry Chemical Type Fire Extinguishers: Carbon steel tank, with pressure gauge.
   2. Class: A:B:C type.
2.03 FIRE EXTINGUISHER CABINETS
A. Fire Rating: Listed and labeled in accordance with ASTM E814 requirements for fire resistance rating of walls where being installed.
B. Cabinet Construction: Non-fire rated.
   1. Formed aluminum; ____ inch (____ mm) thick base metal.
C. Fire Rated Cabinet Construction: One-hour fire rated.
   1. Steel; double wall or outer and inner boxes with 5/8 inch (15.9 mm) thick fire barrier material.
D. Cabinet Configuration: Semi-recessed type.
   1. Size to accommodate accessories.
   2. Trim: Flat rolled edge, with 1-1/2 inch (____ mm) wide face.
E. Door: 0.036 inch (0.9 mm) metal thickness, reinforced for flatness and rigidity with lock and breakable window access. Hinge doors for 180 degree opening with continuous piano hinge.
F. Door Glazing: Tempered glass, clear, 1/8 inch (3 mm) thick, and set in resilient channel glazing gasket.
G. Cabinet Mounting Hardware: Appropriate to cabinet, with pre-drilled holes for placement of anchors.
H. Weld, fill, and grind components smooth.
I. Finish of Cabinet Interior: White colored enamel.

2.04 ACCESSORIES
A. Extinguisher Theft Alarm: Battery operated alarm, 10 second delay for disarming, activated by opening cabinet door.
B. Cabinet Signage: FIRE EXTINGUISHER.

PART 3 EXECUTION
3.01 EXAMINATION
A. Verify existing conditions before starting work.
B. Verify rough openings for cabinet are correctly sized and located.

3.02 INSTALLATION
A. Install in accordance with manufacturer's instructions.
B. Secure rigidly in place.
C. Place extinguishers in cabinets.

END OF SECTION
SECTION 10 7500
FLAGPOLES

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Aluminum Flagpoles.

1.02 RELATED REQUIREMENTS
A. Section 03 3000 - Cast-in-Place Concrete: Concrete base and foundation construction.

1.03 REFERENCE STANDARDS

1.04 PERFORMANCE REQUIREMENTS
A. Structural Performance: Provide flagpole assemblies, including anchorages and supports, capable of withstanding the effects of wind loads, determined according to NAAMM FP 1001, "Guide Specifications for Design of Metal Flagpoles."
   1. Base flagpole design on polyester, nylon or cotton flags of maximum standard size suitable for use with flagpole or flag size indicated, whichever is more stringent.
   2. Basic Wind Speed: 90 mph (40 m/s); 3-second gust speed at 33 feet (10 m) aboveground.

1.05 SUBMITTALS
A. See Section 01 3000 - 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.
D. Structural Calculations: For flagpoles indicated to comply with design loads, include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
E. Finish Samples for Verification: For each finished material used for flagpoles and accessories.

1.06 QUALITY ASSURANCE
A. Source Limitations: Obtain flagpole as a complete unit, including fittings, accessories, bases, and anchorage devices, from a single manufacturer.

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.concordamericanflagpole.com
   2. Substitutions: See Section 01 6000 - Product Requirements.

2.02 FLAGPOLES
A. Flagpoles: Designed in accordance with NAAMM FP 1001.
   1. Material: Aluminum.
   2. Design: Cone tapered.
3. Mounting: Ground mounted type.
4. Outside Butt Diameter: 7 inches (____ mm).
5. Outside Tip Diameter: 3 inches (____ mm).
6. Nominal Wall Thickness: .188 inches (____ mm).
7. Nominal Height: 35 ft (____ m); measured from adjacent nominal ground elevation. Do not measure from top of planter.

2.03 POLE MATERIALS
   A. Aluminum: ASTM B241/B241M, 6063 alloy, T6 temper.

2.04 ACCESSORIES
   A. Finial Ball: Aluminum, 6 inch (150 mm) diameter.
   B. Truck Assembly: Cast aluminum; revolving, stainless steel ball bearings, non-fouling.
   C. Flag: US Flag design, 5 ft by 8 ft (1.5 m by 2.4 m) size, nylon fabric, brass grommets, hemmed edges.
   D. Cleat Box: Aluminum, with built-in hinge and hasp assembly, attached to pole with tamper proof screws inside box.
   E. Halyard: 5/16 inch (8 mm) diameter stainless steel aircraft cable.

2.05 OPERATORS
   A. Hand Crank: Removable type.

2.06 MOUNTING COMPONENTS
   A. Foundation Tube Sleeve: AASHTO M 36, corrugated 16 gage, 0.0598 inch (1.52 mm) steel, galvanized, depth of 60 inches (____ mm) as indicated.
   B. Lighting Ground Rod: 12 inch (____ mm) long steel rod, 3/4 inch (19 mm) diameter.

2.07 FINISHING
   A. Aluminum: Mill finish.
   B. Finial: Spun finish.

PART 3 EXECUTION

3.01 EXAMINATION
   A. Verify that concrete foundation is ready to receive work and dimensions are as indicated on shop drawings.

3.02 PREPARATION
   A. Coat metal sleeve surfaces below grade and surfaces in contact with dissimilar materials with asphaltic paint.

3.03 INSTALLATION
   A. Install flagpole, base assembly, and fittings in accordance with manufacturer's instructions.
   B. See Section on Landscape drawings for placement of anchor devices and foundation sleeve.
   C. Fill foundation tube sleeve with concrete specified in Section 03 3000.
   D. Install foundation plate and centering wedges for flagpoles base set in concrete base and fasten.

3.04 TOLERANCES
   A. Maximum Variation From Plumb: 1 inch (25 mm).

3.05 ADJUSTING
   A. Adjust operating devices so that halyard and flag function smoothly.

END OF SECTION
SECTION 11 4000
FOODSERVICE EQUIPMENT

PART 2 PRODUCTS

1.01 EQUIPMENT

A. Equipment Schedule: Refer to schedule at end of this section.
B. Installation Accessories: Provide rough-in hardware, supports and connections, attachment devices, closure trim, and accessories as required for complete installation.

END OF SECTION
SECTION 11 5213
PROJECTION SCREENS

PART 1 GENERAL
1.01 SECTION INCLUDES
  A. Front projection screen assemblies.
  B. Rear projection screen assemblies.

1.02 RELATED REQUIREMENTS
  A. Section 26 0583 - Wiring Connections: Electrical supply, conduit, and wiring for electric motor operated projection screens.

1.03 SUBMITTALS
  A. See Section 01 3000 - 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 by 6 inch (152 by 152 mm) in size.
  E. Samples: For case and frame finishes, submit two samples 6 by 6 inch (152 by 152 mm) in size, illustrating color and texture of finish.
  F. Operation and Maintenance Data: Provide manufacturer's operation and maintenance instructions.
  G. Warranty: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

1.04 DELIVERY, STORAGE, AND HANDLING
  A. Deliver projection screens to project site in manufacturer's original unopened packaging, and inspect for damage and proper size before accepting delivery.
  B. Store in a protected, clean, dry area with temperature maintained above 50 degrees F (10 degrees C), and stack in accordance with manufacturer's recommendations.
  C. Acclimate screens to building temperatures for 24 hours prior to installation, in accordance with manufacturer's recommendations.

1.05 FIELD CONDITIONS
  A. Maintain interior of building between 60 degrees F (15 degrees C) and ___ degrees F (___ degrees C) during and after installation of projection screens.

1.06 WARRANTY
  A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
  B. Provide 5 year manufacturer warranty for projection screen assembly.

PART 2 PRODUCTS
2.01 FRONT PROJECTION SCREENS
  A. Manufacturers:
     2. Substitutions: See Section 01 6000 - Product Requirements.
  B. Front Projection Screens: Factory assembled unless otherwise indicated.
     1. Dimensions: 6'-5" x 11'-5"
C. Exposed Screen Cases: Steel, with integral roller brackets.
   1. Finish: Baked enamel.
   3. End Caps: Steel; finished to match case.

D. Electrically-Operated Screens:
   1. Roller: Steel, 2 inch (51 mm) in diameter, with locking device.
   2. Vertical Tensioning: Screen fabric weighted at bottom with steel bar and plastic end caps.

E. 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 FABRIC REAR PROJECTION SCREENS

A. Manufacturers:

B. Rear Projection Screen Fabric: Translucent; washable; flame retardant and mildew resistant.
   1. Material: Vinyl fabric without backing, with nominal gain of 2.1 on axis, not less than 1.5 at 10 degrees from axis, and not less than 0.8 at 20 degrees from axis.
   2. Seams: No seams permitted in fabric up to 96 inch (2438 mm) high by 72 inch (1829 mm) wide.
   4. Screen Dimensions: 9'-0" x 16'-0"

C. Frame: Aluminum frame, reinforced with truss.
   1. Finish: Black powder coat; self-trimming.
   2. Screen Tensioning: Velcro tabs.
   3. Webbing: Black, four sides.
   5. Mounting: Hung from ceiling.

2.03 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 and lifetime lubricated; equipped with thermal overload cut-off, internal junction box, electric brake, and pre-set accessible limit switches.
      a. Electrical Characteristics: 1.2 amps.
      b. Motor mounted on sound absorber.

C. Controls: Three (3) position control switch with plate.

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 Architect 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 Date of Substantial Completion.

END OF SECTION
SECTION 11 6143
STAGE CURTAINS

PART 1 GENERAL
1.01 SECTION INCLUDES
   A. Stage curtain fabrics.
   B. Linings.
   C. Scrims and drops.
   D. Stage curtain track support systems.

1.02 REFERENCE STANDARDS
   D. ITS (DIR) - Directory of Listed Products; current edition.
   F. UL (DIR) - Online Certifications Directory; Current Edition.

1.03 ADMINISTRATIVE REQUIREMENTS
   A. Preinstallation Meeting: Conduct a preinstallation meeting one week prior to the start of the work of this section; require attendance by all affected installers.

1.04 SUBMITTALS
   A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
   B. Product Data: Provide for each type of product as follows:
       1. Stage Curtains: Provide information on type of curtain, weight, location for use on project, and type of flame retardancy.
       2. Tracks: Provide capacity of each curtain track to support curtain weight and control curtain operation.
   C. Shop Drawings: Indicate installation information for components not dimensioned or detailed in product data.
   D. Selection Samples: Submit color chart for each type of stage curtain indicated that includes full range of colors, textures, and patterns available, along with 12 inch (305 mm) square fabric sample, in any color, of each fabric type and seam.
   E. Delegated Design Data: Indicate stage curtain system structural attachments, including analysis data signed and sealed by qualified designer responsible for their preparation.
   F. Manufacturer's Qualification Statement.
   G. Operation and Maintenance Data: For stage curtains and rigging operations.
   H. Warranty Documentation: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

1.05 QUALITY ASSURANCE
   A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years of documented experience.
   B. Installer Qualifications: Company specializing in performing work of the type specified and with minimum three years of documented experience.
1.06 FIELD CONDITIONS

A. Ambient Conditions: Do not install stage curtains until spaces are fully enclosed and watertight, and the following:
   1. Wet work in adjacent areas is complete and surfaces are dry.
   2. Work at and above ceiling level has been completed.
   3. Ambient temperatures and humidity of adjacent areas are maintained at levels when occupied for intended use.

B. Field Measurements: Confirm supporting structural element locations and adjacent construction for stage curtains and rigging, and complete field measurements prior to fabrication and include these dimensions on shop drawings.

1.07 WARRANTY

A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

B. Correct defective Work within a two year period after Date of Substantial Completion.
   1. Defective Work includes, but is not limited to, stage curtain support and rigging that is not operating properly.

PART 2 PRODUCTS

2.01 PERFORMANCE REQUIREMENTS

A. Stage Curtain Systems Design: Engage qualified designer to develop design of stage curtain system, including comprehensive project specific analysis of necessary structural system attachments in compliance with performance requirements.

B. Structural Performance: Ensure attachment of stage curtain system to structure withstands material weight and operational loads applicable for this project and in compliance with local building codes and authorities having jurisdiction.
   1. Design Loads: Weight of stage curtains and track system.

C. Fire-Test Characteristics: Stage curtain fabrics in compliance with NFPA 701 flame propagation fire test requirements conducted by authorized testing agency, listed by UL (DIR), ITS (DIR), or FM (AG) and acceptable to authorities having jurisdiction.
   1. Permanently attach label to fabric of each curtain assembly indicating fabric treatment as follows:
      a. Inherently Flame Retardant (IFR), fibers/yarns that are non-combustible for life of fabric.
      b. Durable Flame Retardant (DFR), fibers/yarns that are non-combustible for life of fabric.
      c. Flame Retardant (FR), fabric has been topically treated in an immersion process with chemical fire retardant.
         1) Indicate retreatment requirements after cleaning or after designated period of time.

2.02 STAGE CURTAIN FABRICS

A. Provide curtains of matching fabric and color from single dye lot, and when size and quantity of curtains exceeds maximum dye lot size, provide curtain or adjacent pair of curtains from only one dye lot, and arrange curtain dye lots to minimize exposure of any differences.

B. Polyester Velour: Weighing at least 25 ounces/linear yard (778 grams/linear meter), napped fabric of 100 percent polyester with minimum pile height of 75 mils, 0.075 inch (1.9 mm) and minimum width of 54 inch (1.37 m).
   1. Application: Main Traveler, Main Valance, Olio Traveler, Olio Legs, Olio Valance, Cyclorama Traveler, Cyclorama Legs, Cyclorama Border, and _____ curtains
   2. Color: As selected by Architect from manufacturer's full range.
   3. Texture: As selected by Architect from manufacturer's full range.
   4. Pattern: As selected by Architect from manufacturer's full range.
   5. Products:
2.03 LININGS
A. Light-Weight Polyester Lining: Weighing at least 10 ounces/linear yard (310 grams/linear meter), 100 percent polyester fabric; 72 inch (1.83 m) minimum width.
   2. Products:
      b. Substitutions: See Section 01 6000 - Product Requirements.

2.04 SCRIMS AND DROPS
A. Scrim: Lightweight seamless gauze flat sewn fabric with an open weave.
   1. Application: Skydrop and Backdrop curtains.
   2. Color: As selected by Architect from manufacturer's full range.

2.05 CURTAIN TRACK
A. Steel Track: Commercial quality, roll-formed, galvanized steel sheet, ASTM A653/A653M, with G60 (Z180) coating designation; with continuous bottom slot and each half of track in single continuous piece; black paint finish; including support and operation accessories.
   1. Thickness: As recommended by manufacturer for curtain loads and operation.
      a. Heavy-Duty: 14 gage, 0.0747 inch (1.90 mm) minimum thickness.
   2. Products:
      b. Substitutions: See Section 01 6000 - Product Requirements.
B. Curtain Rails: Provide single curtain capacity as indicated on drawings, and end stops.
C. Operation:
   1. Manual Cord Operation: Curtain track with cord, pulleys, and floor pulley; must manually open and close the curtain.
      a. Operating Line: 3/8 inch (9.5 mm) diameter, stretch-resistant operating cord with braided synthetic-fiber cover over solid, synthetic-fiber, linear filaments.
      b. End Pulleys: One single dead-end and one double live-end pulley, with sheaves having shielded ball bearings housed in plated-steel covers that match track finish, and provide with bracket for securing off-stage end of curtain.
      c. Floor Pulleys: Sheave, adjustable type with 3 inch (76 mm) diameter wheels, and having shielded ball bearings housed in plated-steel covers, painted black.
D. Track System: Provide heavy-duty curtain track with components as recommended by manufacturer for loads and operation, including track end stops.
   1. Carriers: Standard plated-steel carriers with a pair of nylon tired ball-bearing wheels riveted parallel to body, and equip carriers with rubber or neoprene bumpers to reduce noise and plated-steel swivel eye and trim chain for attaching curtain snap or S-hook, and required number of curtain carriers for track length and curtain fabrication.
      a. Master Curtain Carriers: One plated-steel master carrier for each leading curtain edge, with two pairs of nylon tired ball-bearing wheels and with two line guides per carrier.
   2. Pulleys: One dead-end, single-wheel pulley; one live-end, double-wheel pulley; and one adjustable pulley to maintain proper tension on operating line; each with gas-filled-nylon-tired ball-bearing sheaves enclosed in steel housings; pulleys with steel housing finished to match track and with bracket for securing off-stage end of curtain.

2.06 FABRICATION - CURTAINS
A. General: Provide vertical seams unless otherwise indicated, locate vertical seams so they do not fall on faces of pleats, and only use fabric that is cut greater than half the width of fabric.
B. Vertical and Top Hems: Machine sew hems as follows, unless otherwise indicated:
1. **Vertical Hems:** Fabricate at least 2 inch (51 mm) wide, and at least 4 inch (102 mm) wide at borders, valances, teasers, and tormentors with at least 1 inch (25.4 mm) tuck and without visible selvedge material from front of curtain; sew open ends of hems closed.

2. **Turnbacks:** Fabricate leading-edge and trailing-edge turnbacks for traveler curtains by folding back at least 12 inch (305 mm) of face fabric, with at least 1 inch (25.4 mm) tuck, and vertically secured by sewing.

3. **Top Hems:** Fabricate by double-stitching 3-1/2 inch (89 mm) wide, heavy jute or laminated synthetic webbing to top edge at back side of curtain with at least 2 inch (51 mm) of face fabric turned under.

**C. Fullness:**
1. 50 Percent Fullness: Provide this fullness, exclusive of turnbacks and hems, and spaced at 12 inch (305 mm) on center along top hem reinforcement as follows:

**D. Grommets:**
1. **Pleated Curtains:** Provide grommets centered on each box pleat and placed 1 inch (25.4 mm) from corner of curtain; for snap hooks or S-hooks.

**E. Bottom Hems:** Machine sew hems as follows, unless otherwise indicated:
1. **For Curtains With Fullness:**
   a. **Curtains That Don't Hang to Floor:** Hems at least 3 inch (76 mm) deep, with weight tape, 3/4 inch (19 mm), and open ends of hems sewn closed.
   b. **Floor Length Curtains:** Provide hems at least 6 inch (152 mm) deep, with individual weights in individual closed pockets sewn above finished bottom edge of curtain, and open ends of hems sewn closed.
2. **Lining:** Provide lining for curtain with matching fullness of face fabric and finished 2 inch (51 mm) shorter than face fabric, and sew or otherwise securely fasten lining to top hem of face fabric.
   a. Attach lining to face fabric along bottom and side seams with 4 inch (102 mm) long strips of heavy woven cotton tape.
   b. Sew lining to bottom edge of curtain to provide sufficient lining fabric for tucking and to accommodate for shrinkage.

**2.07 ACCESSORIES**
A. **Snap Hooks:** Manufacturer's standard heavy-duty snap hooks, sewn into top edge of curtain.
B. **Trim and Support Chain:** Hardened alloy steel chain rated for overhead lifting, Grade 80 in accordance with ASTM A391/A391M.
C. **Inserts, Bolts, Rivets, and Fasteners:** Manufacturer's standard and corrosion-resistant.

**PART 3 EXECUTION**

**3.01 EXAMINATION**
A. Examine areas and conditions, with installer present, for compliance with requirements for supporting structural members, blocking, clearances, installation tolerances, and other conditions that may impact performance of stage curtain assembly.
B. Examine placement and condition of inserts, clips, blocking, or other supports installed by others and for use in supporting track and battens of stage curtain assembly.
C. Proceed with installation only after unsatisfactory conditions have been corrected.

**3.02 INSTALLATION, GENERAL**
A. Install stage curtain assembly in accordance with curtain and track manufacturers written instructions.

**3.03 INSTALLATION - CURTAIN**
A. **Track Hung:** Secure curtains to track carriers with snap hooks.

**3.04 INSTALLATION - TRACK**
A. Mounting of Track Assembly:
1. Ceiling Mounted: Provide ceiling supports for mounting track direct to ceiling structure and within intervals indicated in manufacturer's written instructions for on center spacing.

B. Track Support Spacing: Comply with manufacturer's recommendations for applied loads, and not to exceed the following dimensions between track supports:
   1. Heavy-Duty Track: 6 feet (1.83 m), maximum.

C. Install track for center-parting curtains with at least 24 inch (610 mm) overlap of track sections at center-line, and supported with track lap clamps.

3.05 PROTECTION
   A. Protect installed stage curtain assembly from subsequent construction operations until Date of Substantial Completion.

END OF SECTION
SECTION 11 6623
GYMNASIUM EQUIPMENT

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Basketball backboards, goals, and support framing.
B. Wall mounted protection pads.

1.02 REFERENCE STANDARDS

1.03 SUBMITTALS
A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide manufacturer's data showing configuration, sizes, materials, finishes, hardware, and accessories; include:
   1. Structural steel welder certifications.
   2. 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.
D. 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: Company specializing in manufacturing products specified in this section, with not less than three years of documented experience.

1.05 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.

1.06 WARRANTY
A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
B. Provide 3 year manufacturer warranty for parts, finishes, and labor.

PART 2 PRODUCTS

2.01 MANUFACTURERS
A. Gymnasium Equipment:
   2. IPI by Bison, Inc: www.ipibybison.com/#sle.
   5. Substitutions: See Section 01 6000 - Product Requirements.

2.02 GENERAL REQUIREMENTS
A. See drawings for sizes and locations, unless noted otherwise.
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. Structural Steel Fabrications: Welded in accordance with AWS D1.1/D1.1M, using certified welders.

2.03 BASKETBALL

A. Basketball System: Backstop assembly, backboard, and goal.
   1. Manufacturers:
      b. IPI by Bison, Inc: www.ipibybison.com/#sle.
      c. Substitutions: See Section 01 6000 - Product Requirements.

B. General: Provide equipment complying with requirements in "NFHS Basketball Rule Book." Protruding fasteners or exposed bolt heads on front face of backboards are not permitted.

C. Wall-Mounted Backstops: Complete assembly extending from wall, including 2 x 8 solid red oak support wall pad framing to building structure, bracing, cables, chains, pulleys, fittings, hardware, pipe anchors, equipment pads, and fasteners.
   1. Center strut wall mounted with 3 point framing & horizontal wood wall pads.
   2. Framing: Steel pipe, tubing, and shapes. Design framing to minimize vibration during play.
      a. Finish: Manufacturer's standard factory-applied, baked powder-coating finish complying with finish manufacturer's written instructions for surface preparation including pretreatment, application, baking, and minimum dry film thickness; black
   3. Stationary Type: Provide manufacturer's standard assembly for stationary backstop.
   4. Extension: as indicated on Drawings.
   5. Goal Height Adjuster: Adjustable from 8 to 10 feet (2.4 to 3 m) with crank mechanism, locking in any position within adjustment range, with visible height scale and finish matching framing.

D. Goal Mounting Assembly: Compatible with goal, backboard, and support framing, with manufacturer's standard.

E. Basketball Goals: Complete with flanges, braces, attachment plate, and evenly spaced loops welded around underside of ring.
   1. Single-Rim Basket Ring Competition Goal: Materials, dimensions, and fabrication per manufacturer's standard design.
   2. Type: Movable, breakaway design with manufacturer's standard breakaway mechanism and rebound characteristics identical to those of fixed, nonmovable ring.
   5. Finish: Manufacturer's standard factory-applied, baked powder-coating finish complying with finish manufacturer's written instructions for surface preparation including pretreatment, application, baking, and minimum dry film thickness; orange.

F. Basketball Nets: 12-loop-mesh net, between 15 and 18 inches (400 to 450 mm) long, sized to fit rim diameter, and as follows:
   1. Cord: Made from white nylon.

G. Safety Pads: Provide safety pads, designed for backboard thickness indicated and extending continuously along bottom and up sides of backboard and over goal mounting and backboard supports as per manufacturer's standard design.
   1. Safety Pad Attachment: Manufacturer's standard.
   2. Color: As selected by Architect from manufacturer's full range.

2.04 WALL PADDOING

A. Wall Padding: Foam filling bonded to backing board, wrapped in covering; each panel fabricated in one piece.
      a. Color: As selected by the Architect from manufacturer's standard range.
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, and notify Architect in writing of unsatisfactory or detrimental conditions.
C. Do not proceed with this work until conditions have been corrected; commencing installation constitutes acceptance of work site conditions.

3.02 INSTALLATION
A. Install in accordance with Contract Documents and manufacturer’s instructions.
B. Install equipment rigid, straight, plumb, and level.
C. Secure 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.

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 Date of Substantial Completion.
B. Replace damaged products before Date of Substantial Completion.

END OF SECTION
SECTION 11 6813
PLAYGROUND EQUIPMENT

PART 1  GENERAL
1.01  SECTION INCLUDES
   A. Climbing Walls and accessories.

1.02  SUBMITTALS
   A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
   B. Shop Drawings: Detailed scale drawings showing wall layout.
      1. Show locations and dimensions.
      2. Clearly identify hand hold mounting elevations from grade.
   C. Samples: For each item that a color must be selected, provide color chart showing full range of colors and finishes.
   D. Maintenance Data: Provide manufacturer's recommended maintenance instructions and list of replaceable parts for each equipment item, with address and phone number of source of supply.

1.03  DELIVERY, STORAGE, AND HANDLING
   A. Store materials in a dry, covered area, elevated above grade.

PART 2  PRODUCTS
2.01  PLAYGROUND EQUIPMENT - GENERAL
2.02  CUSTOM PLAY STRUCTURES
   A. HDPE climbing walls attached to ICF walls as noted on the drawings.
      1. Manufacturer: Basis of Design - King Plastic Corporation, King ColorBoard and King StarBoard; kingplastic.com
         a. Color:
            1) King Blue (Colorboard)
            2) Dolphin Gray (StarBoard)
   B. Hand Holds
      1. Manufacturer: Basis of Design - Eldorado Climbing, Beginner; eldowalls.com
         a. Number and Shapes: As selected by Architect from manufacturers standard selection.

PART 3  EXECUTION
3.01  INSTALLATION
   A. Install in accordance manufacturer's instructions and requirements of authorities having jurisdiction (AHJ).
   B. Anchor panels and hand holds securely.
   C. Install without sharp points, edges or protrusions, entanglement hazards, pinch, crush, or shear points.

3.02  CLEANING
   A. Restore adjacent existing areas that have been damaged from the construction.
   B. Clean playground equipment of construction materials, dirt, stains, filings, and blemishes due to shipment or installation; clean in accordance with manufacturer's instructions, using cleaning agents as recommended by manufacturer.
   C. Clean playground area of excess construction materials, debris, and waste.
   D. Remove excess and waste material and dispose of off-site in accordance with requirements of authorities having jurisdiction (AHJ).

3.03  PROTECTION
   A. Protect installed products until Date of Substantial Completion.
B. Replace damaged products before Date of Substantial Completion.

END OF SECTION
SECTION 11 6823
EXTERIOR COURT ATHLETIC EQUIPMENT

PART 1 GENERAL

1.01 SUMMARY
A. Section Includes
   1. Tennis furnishings and equipment.

1.02 SUBMITTALS
A. Product Data: Manufacturer's data sheets on each product specified, including detailed installation diagrams and recommended installation methods.
B. Selection Samples: For each product specified, two complete sets of chips representing manufacturer's full range of colors and finishes.
C. Shop Drawings: Indicate all materials, dimensions, welds, finish, etc. for field fabricated items.
D. Maintenance Data: For site furnishings to include in O&M Manuals.

1.03 QUALITY ASSURANCE
A. Furnish paint for touch-up as required.
B. Install pre-manufactured items, poured-in-place or pre-cast items, and all related materials required to complete the work indicated on the drawings and/or specified.
C. Materials Inspection: The Contractor shall inspect all items upon delivery to ensure no damage to material or finish. Minor repairs and/or touch up shall be accepted only upon prior authorization from the landscape architect and shall conform, at minimum, to manufacturer's standards.

1.04 WARRANTY
A. Contractor shall warrant work as provided by the General and Supplementary Conditions and Division 01 Specifications.

PART 2 PRODUCTS

2.01 MATERIALS
A. Tennis Post: Douglas - Premier SQ Item #63053 & 24" Steel Ground Sleeve Item #63425.
B. Tennis Net: Douglas - TN-36T Championship Net Item #30036T - Tapered with Deluxe adjustable Center Strap Item #20600 and Center Pipe Anchor Item #63428.
C. Manufacturer’s standard Powder Coat finish. Color: Green or Black as selected by Owner and Architect during submittal process.
D. Installation per manufacturer's written installation procedures and details. Coordinate installation with Post Tensioned Concrete Paving.
E. Douglas Sports, (800) 553.8907 or www.douglas-sports.com, or approved equal.

PART 3 EXECUTION

3.01 EXAMINATION
A. Examine areas and conditions, with Installer present, for compliance with requirements for correct and level finished grade, mounting surfaces, installation tolerances, and other conditions affecting performance.
B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION
A. Comply with manufacturer's written installation instructions unless more stringent requirements are indicated. Complete field assembly of site furnishings where required.
B. Install furnishings and equipment level, plumb, true, securely anchored and positioned at locations indicated on Drawings.
C. Post Setting: Set cast-in support posts in concrete footing with smooth top, shaped to shed water. Protect portion of posts above footing from concrete splatter. Verify that posts are set plumb or at correct angle and are aligned and at correct height and spacing. Hold posts in position during placement and finishing operations until concrete is sufficiently cured.

D. Touch-up paint, as necessary, all blemishes incurred during shipping or assembly, color as designated, to manufacturer’s standards.

E. Reinstallation of existing items shall include the use of all required new fasteners, footings, etc. to result in a fully functional system. Provide touch-up paint as required.

3.03 ADJUSTING
A. Upon completion of the installation of site furnishings, check each item and verify that all equipment is properly installed; verify that all trim is in place; adjust all components as necessary to ensure proper operation; remove all labels from equipment.
B. Make necessary adjustments for safe, efficient and smooth operation.

3.04 PROTECTION
A. Protect installed products until completion of project.
B. Touch-up, repair or replace damaged products after Substantial Completion.

3.05 CLEANING
A. Remove all packing materials from job site.
B. Clean or restore marred surfaces.

END OF SECTION
SECTION 12 2400
WINDOW SHADES

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Window shades and accessories.

1.02 RELATED REQUIREMENTS
A. Section 06 1000 - Rough Carpentry: Concealed wood blocking for attachment of headrail brackets.
B. Section 09 2116 - Gypsum Board Assemblies: Substrate for window shade systems.
C. Section 26 2726 - Wiring Devices: Finish requirements for wall controls specified in this section.

1.03 REFERENCE STANDARDS
C. 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. 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 3000 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide manufacturer’s standard catalog pages and data sheets including materials, finishes, fabrication details, dimensions, profiles, mounting requirements, and accessories.
C. Shop Drawings: Include shade schedule indicating size, location and keys to details.
D. Certificates: Manufacturer’s documentation that line voltage components are UL listed or UL recognized.
E. Verification Samples: Minimum size 6 inches (150 mm) square, representing actual materials, color and pattern.
F. Project Record Documents: Record actual locations of control systems and show interconnecting wiring.
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. Maintenance contracts.

1.06 QUALITY ASSURANCE
A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than five years of documented experience.
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 7800 - Closeout Submittals, for additional warranty requirements.
B. Provide manufacturer's warranty from Date of Substantial Completion, covering the following:
   1. Shade Hardware: One year.
   2. Fabric: One year.
   3. Aluminum and Steel Coatings: One year.

PART 2 PRODUCTS

2.01 MANUFACTURERS
A. Manually Operated Roller Shades:
   2. Substitutions: See Section 01 6000 - Product Requirements.
B. Source Limitations: Furnish products produced by a single manufacturer and obtained from a single supplier.

2.02 WINDOW SHADE APPLICATIONS
A. Interior Roller Shades: Translucent shades.
   1. Type: Roll down, closed position is at window sill.
   2. Fabric Performance Requirements:
      a. Openness Factor: one percent (1%).
   3. Color: As indicated in the Finish Schedule.

2.03 ROLLER SHADES
A. Roller Shades: Fabric roller shades complete with mounting brackets, roller tubes, hembars, hardware and accessories.
   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.
   1. Flammability: Pass NFPA 701 large and small tests.
C. Roller Tubes: As required for type of operation.
   1. Material: Extruded aluminum or galvanized steel; as required for shade location.
   2. Fabric Attachment: Utilize extruded channel in tube to accept vinyl spline welded to fabric edge.
   3. Finish: Baked enamel; color from manufacturer's standards.
D. Hembars: Designed for weight requirements and adaptation to uneven surfaces, to maintain bottom of shade straight and flat.
E. Manual Operation for Interior Shades: Clutch operated continuous loop; nylon cord complying with WCMA A100.1.

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. Exterior Side Channels: As required in exterior applications for guiding and securing shade material.
D. Number Plates: Number each opening and shade. Provide aluminum number plates for each shade unit and each opening. Fasten shade plate to the back of roller. Fasten opening plate on unexposed surface of the opening.
E. Fasteners: Non-corrosive, and as recommended by shade manufacturer.

2.05 FABRICATION
A. Field measure finished openings prior to ordering or fabrication.
B. Fabricate shades to fit openings within specified tolerances.
   1. Vertical Dimensions: Fill openings from head to sill with 1/2 inch (13 mm) space between bottom bar and window sill.
   2. Horizontal Dimensions - Outside Mounting: Cover window frames, trim, and casings completely.
C. Dimensional Tolerances: As recommended in writing by manufacturer.
D. 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. Maximum Offset From Level: 1/16 inch (1.5 mm).
C. Replace shades 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 smooth shade operation.

3.04 CLEANING
A. Clean soiled shades and exposed components as recommended by manufacturer.
B. Replace shades that cannot be cleaned to “like new” condition.

3.05 CLOSEOUT ACTIVITIES
A. See Section 01 7800 - Closeout Submittals, for closeout submittals.
B. 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.

3.06 PROTECTION
   A. Protect installed products from subsequent construction operations.
   B. Touch-up, repair or replace damaged products before Substantial Completion.

3.07 MAINTENANCE
   A. See Section 01 7000 - Execution and Closeout Requirements, for additional requirements relating to maintenance service.
   B. Provide to Owner, a proposal as an alternate to the base bid, a separate renewable maintenance contract for the service and maintenance of a motorized shade system for one year from date of Substantial Completion. Include a complete description of preventive maintenance, systematic examination, adjustment, parts and labor, cleaning, and testing, with a detailed schedule.

END OF SECTION
SECTION 14 2400
MACHINE ROOM-LESS HYDRAULIC PASSENGER ELEVATORS

PART 1 GENERAL

1.01 SUMMARY

A. Section includes: Machine room-less hydraulic passenger elevators as shown and specified. Elevator work includes:

2. Elevator car enclosures, hoistway entrances and signal equipment.
3. Operation and control systems.
4. Jack(s).
5. Accessibility provisions for physically disabled persons.
6. Equipment, machines, controls, systems and devices as required for safely operating the specified elevators at their rated speed and capacity.
7. Materials and accessories as required to complete the elevator installation.

B. Related Sections:

1. Division 1 General Requirements: Meet or exceed all referenced sustainability requirements.
2. Division 3 Concrete: Installing inserts, sleeves and anchors in concrete.
3. Division 4 Masonry: Installing inserts, sleeves and anchors in masonry.
4. Division 5 Metals:
   a. Providing hoist beams, pit ladders, steel framing, auxiliary support steel and divider beams for supporting guide-rail brackets.
   b. Providing steel angle sill supports and grouting hoistway entrance sills and frames.
5. Division 9 Finishes: Providing elevator car finish flooring and field painting unfinished and shop primed ferrous materials.
6. Division 16 Sections:
   a. Providing electrical service to elevators, including fused disconnect switches where permitted. (note: fused disconnect switch to be provided as part of elevator manufacture product, see section 2.11 Miscellaneous elevator components for further details.)
   b. Emergency power supply, transfer switch and auxiliary contacts.
   c. Heat and smoke sensing devices.
   d. Convenience outlets and illumination in control room (if applicable), hoistway and pit.
7. Division 22 Plumbing
   a. Sump pit and oil interceptor.
8. Division 23 Heating, Ventilation and Air Conditioning
   a. Heating and ventilating hoistways and/or control room.

C. Work Not Included: General contractor shall provide the following in accordance with the requirements of the Model Building Code and ANSI A17.1 Code. For specific rules, refer to ANSI A17.1, Part 3 for hydraulic elevators. State or local requirements must be used if more stringent. The cost of this work is not included in the thyssenkrupp Elevator’s proposal, since it is a part of the building construction.

1. Elevator hoist beam to be provided at top of elevator shaft. Beam must be able to accommodate proper loads and clearances for elevator installation and operation.
2. Supply in ample time for installation by other trades, inserts, anchors, bearing plates, brackets, supports and bracing including all setting templates and diagrams for placement.
3. Hatch walls require a minimum two hours of fire rating. Hoistway should be clear and plumb with variations not to exceed 1/2” at any point.
4. Elevator hoistways shall have barricades, as required.
5. Install bevel guards at 75° on all recesses, projections or setbacks over 2” (4” for A17.1 2000 areas) except for loading or unloading.
6. Provide rail bracket supports at pit, each floor and roof. For guide rail bracket supports, provide divider beams between hoistway at each floor and roof.
7. Pit floor shall be level and free of debris. Reinforce dry pit to sustain normal vertical forces from rails and buffers.
8. Where pit access is by means of the lowest hoistway entrance, a vertical ladder of non-combustible material extending 42” minimum, (48” minimum for A17.1-2000 areas) shall be provided at the same height, above sill of access door or handgrips.
9. All wire and conduit should run remote from the hoistways.
10. When heat, smoke or combustion sensing devices are required, connect to elevator control cabinet terminals. Contacts on the sensors should be sized for 12 volt D.C.
11. Install and furnish finished flooring in elevator cab.
12. Finished floors and entrance walls are not to be constructed until after sills and door frames are in place. Consult elevator contractor for rough opening size. The general contractor shall supply the drywall framing so that the wall fire resistance rating is maintained, when drywall construction is used.
13. Where sheet rock or drywall construction is used for front walls, it shall be of sufficient strength to maintain the doors in true lateral alignment. Drywall contractor to coordinate with elevator contractor.
14. Before erection of rough walls and doors; erect hoistway sills, headers, and frames. After rough walls are finished; erect fascias and toe guards. Set sill level and slightly above finished floor at landings.
15. To maintain legal fire rating (masonry construction), door frames are to be anchored to walls and properly grouted in place.
16. The elevator wall shall interface with the hoistway entrance assembly and be in strict compliance with the elevator contractor's requirements.
17. General Contractor shall fill and grout around entrances, as required.
18. All walls and sill supports must be plumb where openings occur.
19. Locate a light fixture (200 lx / 19 fc) and convenience outlet in pit with switch located adjacent to the access door.
20. Provide telephone line, light fixture (200 lx / 19 fc), and convenience outlet in the hoistway at the landing where the elevator controller is located. Typically this will be at the landing above the 1st floor. Final location must be coordinated with elevator contractor.
21. As indicated by elevator contractor, provide a light outlet for each elevator, in center of hoistway.
22. For signal systems and power operated door: provide ground and branch wiring circuits.
23. For car light and fan: provide a feeder and branch wiring circuits to elevator control cabinet.
24. Controller landing wall thickness must be a minimum of 8 inches thick. This is due to the controller being mounted on the second floor landing in the door frame on the return side of the door. For center opening doors, the controller is located on the right hand frame (from inside the elevator cab looking out). These requirements must be coordinated between the general contractor and the elevator contractor.
25. Cutting, patching and recesses to accommodate hall button boxes, signal fixtures, etc..

1.02 SUBMITTALS
   A. Product data: When requested, the elevator contractor shall provide standard cab, entrance and signal fixture data to describe product for approval.
   B. Shop drawings:
      1. Show equipment arrangement in the corridor, pit, and hoistway and/or optional control room. Provide plans, elevations, sections and details of assembly, erection, anchorage, and equipment location.
      2. Indicate elevator system capacities, sizes, performances, safety features, finishes and other pertinent information.
      3. Show floors served, travel distances, maximum loads imposed on the building structure at points of support and all similar considerations of the elevator work.
      4. Indicate electrical power requirements and branch circuit protection device recommendations.
C. Powder Coat paint selection: Submit manufacturer’s standard selection charts for exposed finishes and materials.
D. Plastic laminate selection: Submit manufacturer’s standard selection charts for exposed finishes and materials.
E. Metal Finishes: Upon request, standard metal samples provided.
F. Operation and maintenance data. Include the following:
  1. Owner’s manuals and wiring diagrams.
  2. Parts list, with recommended parts inventory.

1.03 QUALITY ASSURANCE
A. Manufacturer Qualifications: An approved manufacturer with minimum 15 years of experience in manufacturing, installing, and servicing elevators of the type required for the project.
   1. The manufacturer of machines, controllers, signal fixtures, door operators cabs, entrances, and all other major parts of elevator operating equipment.
      a. The major parts of the elevator equipment shall be manufactured by the installing company, and not be an assembled system.
   2. The manufacturer shall have a documented, on-going quality assurance program.
   3. ISO-9001:2000 Manufacturer Certified
   4. ISO-14001:2004 Environmental Management System Certified
B. Installer Qualifications: The manufacturer or an authorized agent of the manufacturer with not less than 15 years of satisfactory experience installing elevators equal in character and performance to the project elevators.
C. Regulatory Requirements:
   1. ASME A17.1 Safety Code for Elevators and Escalators, latest edition or as required by the local building code.
   5. Americans with Disabilities Act - Accessibility Guidelines (ADAAG)
   6. Section 407 in ICC A117.1, when required by local authorities
D. Fire-rated entrance assemblies: Opening protective assemblies including frames, hardware, and operation shall comply with ASTM E2074, UL10(b), and NFPA Standard 80. Provide entrance assembly units bearing Class B or 1 1/2 hour label by a Nationally Recognized Testing Laboratory.
E. Inspection and testing:
   1. Elevator Installer shall obtain and pay for all required inspections, tests, permits and fees for elevator installation.
   2. Arrange for inspections and make required tests.
   3. Deliver to the Owner upon completion and acceptance of elevator work.

1.04 DELIVERY, STORAGE AND HANDLING
A. Manufacturing shall deliver elevator materials, components and equipment and the contractor is responsible to provide secure and safe storage on job site.

1.05 PROJECT CONDITIONS
A. Temporary Use: Elevators shall not be used for temporary service or for any other purpose during the construction period before Substantial Completion and acceptance by the purchaser unless agreed upon by Elevator Contractor and General Contractor with signed temporary agreement.

1.06 WARRANTY
A. Warranty: Submit elevator manufacturer's standard written warranty agreeing to repair, restore or replace defects in elevator work materials and workmanship not due to ordinary wear and tear or improper use or care for 12 months after final acceptance.
1.07 MAINTENANCE

A. Furnish maintenance and call back service for a period of 3 months for each elevator after completion of installation or acceptance thereof by beneficial use, whichever is earlier, during normal working hours excluding callbacks.
   1. Service shall consist of periodic examination of the equipment, adjustment, lubrication, cleaning, supplies and parts to keep the elevators in proper operation. Maintenance work, including emergency call back repair service, shall be performed by trained employees of the elevator contractor during regular working hours.
   2. Submit parts catalog and show evidence of local parts inventory with complete list of recommended spare parts. Parts shall be produced by manufacturer of original equipment.
   3. Manufacturer shall have a service office and full time service personnel within a 100 mile radius of the project site.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Basis of Design: thyssenkrupp Elevator, Endura Machine Room-Less hydraulic elevator, twin post, above ground 2-stage, 2500 lbs.

2.02 MATERIALS, GENERAL

A. Colors, patterns, and finishes: As selected by the Architect from manufacturer's full range of standard colors, patterns, and finishes.

B. Steel:
   1. Shapes and bars: Carbon.
   2. Sheet: Cold-rolled steel sheet, commercial quality, Class 1, matte finish.
   3. Finish: Factory-applied baked enamel for structural parts, powder coat for architectural parts. Color selection must be based on elevator manufacture’s standard selections.

C. Plastic laminate: Decorative high-pressure type, complying with NEMA LD3, Type GP-50 General Purpose Grade, nominal 0.050” thickness. Laminate selection must be based on elevator manufacture's standard selections.

D. Flooring by others.

2.03 HOISTWAY EQUIPMENT

A. Platform: Fabricated frame of formed or structural steel shapes, gusseted and rigidly welded with a wood sub-floor. Underside of the platform shall be fireproofed. The car platform shall be designed and fabricated to support one-piece loads weighing up to 25% of the rated capacity.

B. Sling: Steel stiles bolted or welded to a steel crosshead and bolstered with bracing members to remove strain from the car enclosure.

C. Guide Rails: Steel, omega shaped, fastened to the building structure with steel brackets.

D. Guides: Slide guides shall be mounted on top and bottom of the car.

E. Buffers: Provide substantial buffers in the elevator pit. Mount buffers on continuous channels fastened to the elevator guide rail or securely anchored to the pit floor. Provide extensions if required by project conditions.

F. Jack: A jack unit shall be of sufficient size to lift the gross load the height specified. Factory test jack to ensure adequate strength and freedom from leakage. Brittle material, such as gray cast iron, is prohibited in the jack construction. Provide the following jack type: Twin post holeless. Two jacks piped together, mounted one on each side of the car with a polished steel hydraulic plunger housed in a sealed steel casing having sufficient clearance space to allow for alignment during installation. Each plunger shall have a high pressure sealing system which will not allow for seal movement or displacement during the course of operation. Each Jack Assembly shall have a check valve built into the assembly to allow for automatically re-syncing the two plunger sections by moving the jack to its fully contracted position. The jack shall be designed to be
mounted on the pit floor or in a recess in the pit floor. Each jack section shall have a bleeder valve to discharge any air trapped in the section.

G. Automatic Self-Leveling: Provide each elevator car with a self-leveling feature to automatically bring the car to the floor landings and correct for over travel or under travel. Self-leveling shall, within its zone, be automatic and independent of the operating device. The car shall be maintained approximately level with the landing irrespective of its load.

H. Wiring, Piping, and Oil: Provide all necessary hoistway wiring in accordance with the National Electrical Code. All necessary code compliant pipe and fittings shall be provided to connect the power unit to the jack unit.

I. Pit moisture/water sensor located approximately 1 foot above the pit floor to be provided. Once activated, elevator will perform "flooded pit operation", which will run the car up to the designated floor, cycle the doors and shut down and trip the circuit breaker shunt to remove 3 phase power from all equipment, including pit equipment.

J. Motorized oil line shut-off valve shall be provided that can be remotely operated from the controller landing service panel. Also a means for manual operation at the valve in the pit is required.

2.04 POWER UNIT

A. Power Unit (Oil Pumping and Control Mechanism): A self-contained unit located in the elevator pit consisting of the following items:
   1. NEMA 4/Sealed Oil reservoir with tank cover including vapor removing tank breather
   2. An oil hydraulic pump.
   3. An electric motor.
   4. Electronic oil control valve with the following components built into single housing; high pressure relief valve, check valve, automatic unloading up start valve, lowering and leveling valve, and electro-magnetic controlling solenoids.

B. Pump: Positive displacement type pump specifically manufactured for oil-hydraulic elevator service. Pump shall be designed for steady discharge with minimum pulsation to give smooth and quiet operation. Output of pump shall not vary more than 10 percent between no load and full load on the elevator car.

C. Motor: Standard manufacture motor specifically designed for oil-hydraulic elevator service. Duty rating - motors shall be capable of 80 starts per hour with a 30% motor run time during each start.

D. Oil Control Unit: The following components shall be built into a single housing. Welded manifolds with separate valves to accomplish each function are not acceptable. Adjustments shall be accessible and be made without removing the assembly from the oil line.
   1. Relief valve shall be adjustable and be capable of bypassing the total oil flow without increasing back pressure more than 10 percent above that required to barely open the valve.
   2. Up start and stop valve shall be adjustable and designed to bypass oil flow during start and stop of motor pump assembly. Valve shall close slowly, gradually diverting oil to or from the jack unit, ensuring smooth up starts and up stops.
   3. Check valve shall be designed to close quietly without permitting any perceptible reverse flow.
   4. Lowering valve and leveling valve shall be adjustable for down start speed, lowering speed, leveling speed and stopping speed to ensure smooth "down" starts and stops. The leveling valve shall be designed to level the car to the floor in the direction the car is traveling after slowdown is initiated.
   5. Provided with constant speed regulation in both up and down direction. Feature to compensate for load changes, oil temperature, and viscosity changes.
   7. A secondary hydraulic power source (powered by 110VAC single phase) must be provided. This is required to be able to raise (reposition) the elevator in the event of a system component failure (i.e. pump motor, starter, etc.)
8. Oil Type: Provide a zinc free, inherently biodegradable lubricant formulated with premium base stocks to provide outstanding protection for demanding hydraulic systems, especially those operating in environmentally sensitive areas.

2.05 HOISTWAY ENTRANCES

A. Doors and Frames: Provide complete hollow metal type hoistway entrances at each hoistway opening bolted down construction.
   1. Manufacturer’s standard entrance design consisting of hangers, doors, hanger supports, hanger covers, fascia plates (where required), sight guards, and necessary hardware.
   2. Main landing door & frame finish: Stainless steel panels, no. 4 brushed finish.
   3. Typical door & frame finish: Stainless steel panels, No. 4 brushed finish.

B. Integrated Control System: the elevator controller to be mounted to hoistway entrance above 1st landing. The entrance at this level, shall be designed to accommodate the control system and provide a means of access to critical electrical components and troubleshooting features. See section 2.09 Control System for additional requirements.

C. At the controller landing, the hoistway entrance frame shall have space to accommodate and provide a lockable means of access (group 2 security) to a 3 phase circuit breaker. See section 2.11 Miscellaneous Elevator Components for further details

D. Interlocks: Equip each hoistway entrance with an approved type interlock tested as required by code. Provide door restriction devices as required by code.

E. Door Hanger and Tracks: Provide sheave type two point suspension hangers and tracks for each hoistway horizontal sliding door.
   1. Sheaves: Polyurethane tires with ball bearings properly sealed to retain grease.
   2. Hangers: Provide an adjustable device beneath the track to limit the up-thrust of the doors during operation.
   3. Tracks: Drawn steel shapes, smooth surface and shaped to conform to the hanger sheaves.

F. Hoistway Sills: Extruded metal, with groove(s) in top surface. Provide mill finish on aluminum.

2.06 PASSENGER ELEVATOR CAR ENCLOSURE

A. Car Enclosure:
   1. Walls: Cab type a steel shell design, reinforced cold-rolled steel with an applied panel design. The applied panels design, shall be arranged vertically on wood core panels covered on both sides with stainless steel: ASTM A 167, No. 4 brushed finish.
   2. Reveals and frieze: Factory applied powder coat
   3. Canopy: Cold-rolled steel with hinged exit.
   4. Ceiling: Suspended type, LED lighting with translucent diffuser mounted in a metal frame. Framework shall be finished with a factory applied powder coat finish.
   5. Cab Fronts, Return, Transom, Soffit and Strike: Provide panels faced with No. 4 brushed stainless steel
   6. Doors: Horizontal sliding car doors reinforced with steel for panel rigidity. Hang doors on sheave type hangers with polyurethane tires that roll on a polished steel track and are guided at the bottom by non-metallic sliding guides.
      a. Door Finish: Stainless steel panels: No. 4 brushed finish.
      b. Cab Sills: Extruded aluminum, mill finish.
   7. Handrail: Provide 1.5" diameter cylindrical metal on side and rear walls on front opening cars and side walls only on front and rear opening cars. Handrails shall have a stainless steel, No. 4 brushed finish.
   8. Ventilation: Manufacturer’s standard exhaust fan, mounted on the car top.
   9. Protection pads and buttons: Not required

B. Car Top Inspection: Provide a car top inspection station with an “Auto-Inspection” switch, an “emergency stop” switch, and constant pressure “up and down” direction and safety buttons to make the normal operating devices inoperative. The station shall give the inspector complete
control of the elevator. The car top inspection station shall be mounted in the door operator assembly.

2.07 DOOR OPERATION

A. Door Operation: Provide a direct or alternating current motor driven heavy duty operator designed to operate the car and hoistway doors simultaneously. The door control system shall be digital closed loop and the closed loop circuit shall give constant feedback on the position and velocity of the elevator door. The motor torque shall be constantly adjusted to maintain the correct door speed based on its position and load. All adjustments and setup shall be through the computer based service tool. Door movements shall follow a field programmable speed pattern with smooth acceleration and deceleration at the ends of travel. The mechanical door operating mechanism shall be arranged for manual operation in event of power failure. Doors shall automatically open when the car arrives at the landing and automatically close after an adjustable time interval or when the car is dispatched to another landing. AC controlled units with oil checks, or other deviations are not acceptable.

1. No Un-Necessary Door Operation: The car door shall open only if the car is stopping for a car or hall call, answering a car or hall call at the present position or selected as a dispatch car.

2. Door Open Time Saver: If a car is stopping in response to a car call assignment only (no coincident hall call), the current door hold open time is changed to a shorter field programmable time when the electronic door protection device is activated.

3. Double Door Operation: When a car stops at a landing with concurrent up and down hall calls, no car calls, and no other hall call assignments, the car door opens to answer the hall call in the direction of the car’s current travel. If an onward car call is not registered before the door closes to within 6 inches of fully closed, the travel shall reverse and the door shall reopen to answer the other call.

4. Nudging Operation: The doors shall remain open as long as the electronic detector senses the presence of a passenger or object in the door opening. If door closing is prevented for a field programmable time, a buzzer shall sound. When the obstruction is removed, the door shall begin to close at reduced speed. If the infra-red door protection system detects a person or object while closing on nudging, the doors shall stop and resume closing only after the obstruction has been removed.

5. Door Reversal: If the doors are closing and the infra-red beam(s) is interrupted, the doors shall reverse and reopen. After the obstruction is cleared, the doors shall begin to close.

6. Door Open Watchdog: If the doors are opening, but do not fully open after a field adjustable time, the doors shall recycle closed then attempt to open six times to try and correct the fault.

7. Door Close Watchdog: If the doors are closing, but do not fully close after a field adjustable time, the doors shall recycle open then attempt to close six times to try and correct the fault.

8. Door Close Assist: When the doors have failed to fully close and are in the recycle mode, the door drive motor shall have increased torque applied to possibly overcome mechanical resistance or differential air pressure and allow the door to close.

B. Door Protection Device: Provide a door protection system using microprocessor controlled infra-red light beams. The beams shall project across the car opening detecting the presence of a passenger or object. If door movement is obstructed, the doors shall immediately reopen.

2.08 CAR OPERATING STATION

A. Car Operating Station, General: The main car control in each car shall contain the devices required for specific operation mounted in an integral swing return panel requiring no applied faceplate. Wrap return shall have a No. 4 brushed stainless steel finish. The main car operating panel shall be mounted in the return and comply with handicap requirements. Pushbuttons that illuminate using long lasting LED’s shall be included for each floor served, and emergency buttons and switches shall be provided per code. Switches for car light and accessories shall be provided.

B. Emergency Communications System: Integral phone system provided.
C. Auxiliary Operating Panel: Not Required

D. Column Mounted Car Riding Lantern: A car riding lantern shall be installed in the elevator cab and located in the entrance. The lantern, when illuminated, will indicate the intended direction of travel. The lantern will illuminate and a signal will sound when the car arrives at a floor where it will stop. The lantern shall remain illuminated until the door(s) begin to close.

E. Special Equipment: Not Applicable

2.09 CONTROL SYSTEMS

A. Controller: Shall be integrated in a hoistway entrance jamb. Should be microprocessor based, software oriented and protected from environmental extremes and excessive vibrations in a NEMA 1 enclosure. Control of the elevator shall be automatic in operation by means of push buttons in the car numbered to correspond to floors served, for registering car stops, and by "up-down" push buttons at each intermediate landing and "call" push buttons at terminal landings.

B. Service Panel - to be located outside the hoistway in the controller entrance jamb and shall provide the following functionality/features:
   1. Access to main control board and CPU
   2. Main controller diagnostics
   3. Main controller fuses
   4. Universal Interface Tool (UIT)
   5. Remote valve adjustment
   6. Electronic motor starter adjustment and diagnostics
   7. Operation of pit motorized shut-off valve with LED feedback to the state of the valve in the pit
   8. Operation of auxiliary pump/motor (secondary hydraulic power source)
   9. Operation of electrical assisted manual lowering
   10. Provide male plug to supply 110VAC into the controller
   11. Run/Stop button

C. Automatic Light and Fan shut down: The control system shall evaluate the system activity and automatically turn off the cab lighting and ventilation fan during periods of inactivity. The settings shall be field programmable.

D. Emergency Power Operation: Full automatic operation (Simplex 10-D4A) Upon loss of the normal power supply, building-supplied standby power is available to the elevator on the same wires as the normal power. Once the loss of normal power has been detected and standby power is available, the elevator is lowered to a pre-designated landing and will open the doors. After passengers have exited the elevator, the doors are closed. At this time the elevator is automatically allowed to continue service using the building-supplied standby power.

E. Special Operation: Not Applicable

2.10 HALL STATIONS

A. Hall Stations, General: Provide buttons with white-illuminating or blue-illuminating LED halos to indicate that a call has been registered at that floor for the indicated direction. Provide 1 set of pushbutton risers.
   1. Provide one pushbutton riser with faceplates having a No. 4 brushed stainless steel finish.
      a. Phase 1 firefighter’s service key switch, with instructions, shall be incorporated into the hall station at the designated level.

B. Floor Identification Pads: Provide door jamb pads at each floor. Jamb pads shall comply with Americans with Disabilities Act (ADA) requirements.

C. Hall Position Indicator: An electronic dot matrix position indicator shall be provided and mounted for optimum viewing. As the car travels, its position in the hoistway shall be indicated by the illumination of the alphanumeric character corresponding to the landing which the elevator is stopped or passing. When hall lanterns are provided, the position indicator shall be combined
with the hall lanterns in the same faceplate. Faceplates shall match hall stations. Provide at main landing only.

D. Hall lanterns: Not Applicable

E. Special Equipment: Not Applicable

2.11 MISCELLANEOUS ELEVATOR COMPONENTS

A. Oil Hydraulic Silencer: Install multiple oil hydraulic silencers (muffler device) at the power unit location. The silencers shall contain pulsation absorbing material inserted in a blowout proof housing.

B. Lockable three phase circuit breaker with auxiliary contact with shunt trip capability to be provided. Circuit breaker to be located behind locked panel (Group 2 security access) at controller landing entrance jamb and should be sized according to the National Electrical Code.

C. Lockable single phase 110V circuit breaker for cab light and fan to be provided. Circuit breaker to be located behind locked panel (Group 2 security access) at controller landing entrance jamb should be sized according to the National Electrical Code

PART 3 EXECUTION

3.01 EXAMINATION

A. Before starting elevator installation, inspect hoistway, hoistway openings, pits and/or control room, as constructed, verify all critical dimensions, and examine supporting structures and all other conditions under which elevator work is to be installed. Do not proceed with elevator installation until unsatisfactory conditions have been corrected in a manner acceptable to the installer.

B. Installation constitutes acceptance of existing conditions and responsibility for satisfactory performance.

3.02 INSTALLATION

A. Install elevator systems components and coordinate installation of hoistway wall construction.
   1. Work shall be performed by competent elevator installation personnel in accordance with ASME A17.1, manufacturer's installation instructions and approved shop drawings.
   2. Comply with the National Electrical Code for electrical work required during installation.

B. Perform work with competent, skilled workmen under the direct control and supervision of the elevator manufacturer's experienced foreman.

C. Supply in ample time for installation by other trades, inserts, anchors, bearing plates, brackets, supports, and bracing including all setting templates and diagrams for placement.

D. Welded construction: Provide welded connections for installation of elevator work where bolted connections are not required for subsequent removal or for normal operation, adjustment, inspection, maintenance, and replacement of worn parts. Comply with AWS standards for workmanship and for qualification of welding operators.

E. Coordination: Coordinate elevator work with the work of other trades, for proper time and sequence to avoid construction delays. Use benchmarks, lines, and levels designated by the Contractor, to ensure dimensional coordination of the work.

F. Install machinery, guides, controls, car and all equipment and accessories to provide a quiet, smoothly operating installation, free from side sway, oscillation or vibration.

G. Alignment: Coordinate installation of hoistway entrances with installation of elevator guide rails for accurate alignment of entrances with cars. Where possible, delay final adjustment of sills and doors until car is operable in shaft. Reduce clearances to minimum safe, workable dimensions at each landing.

H. Erect hoistway sills, headers, and frames before erection of rough walls and doors; erect fascia and toe guards after rough walls finished. Set sill units accurately aligned and slightly above finish floor at landings.

I. Lubricate operating parts of system, where recommended by manufacturer.
3.03 FIELD QUALITY CONTROL

A. Acceptance testing: Upon completion of the elevator installation and before permitting use of elevator, perform acceptance tests as required and recommended by Code and governing regulations or agencies. Perform other tests, if any, as required by governing regulations or agencies.

B. Advise Owner, Contractor, Architect, and governing authorities in advance of dates and times tests are to be performed on the elevator.

3.04 ADJUSTING

A. Make necessary adjustments of operating devices and equipment to ensure elevator operates smoothly and accurately.

3.05 CLEANING

A. Before final acceptance, remove protection from finished surfaces and clean and polish surfaces in accordance with manufacturer's recommendations for type of material and finish provided. Stainless steel shall be cleaned with soap and water and dried with a non-abrasive surface; it shall not be cleaned with bleach-based cleansers.

B. At completion of elevator work, remove tools, equipment, and surplus materials from site. Clean equipment rooms and hoistway. Remove trash and debris.
   1. Use environmentally preferable and low VOC emitting cleaners for each application type. Cleaners that contain solvents, pine and/or citrus oils are not permitted.

3.06 PROTECTION

A. At time of Substantial Completion of elevator work, or portion thereof, provide suitable protective coverings, barriers, devices, signs, or other such methods or procedures to protect elevator work from damage or deterioration. Maintain protective measures throughout remainder of construction period.

3.07 DEMONSTRATION

A. Instruct Owner's personnel in proper use, operations, and daily maintenance of elevators. Review emergency provisions, including emergency access and procedures to be followed at time of failure in operation and other building emergencies. Train Owner's personnel in normal procedures to be followed in checking for sources of operational failures or malfunctions.

B. Make a final check of each elevator operation, with Owner's personnel present, immediately before date of substantial completion. Determine that control systems and operating devices are functioning properly.

3.08 ELEVATOR SCHEDULE

A. Elevator
   1. Elevator Model: enduraMRL Above-Ground (2-stage)
   2. Elevator Type: Hydraulic Machine Room-Less, Passenger
   4. Rated Speed: 80 ft./min.
   5. Operation System: TAC32H
   6. Travel: 15'-4" (V.I.F.)
   7. Landings: 2 total
   8. Openings:
      a. Front: 1
      b. Rear: 0
   9. Clear Car Inside: 6' - 8" wide x 4' - 3" deep
   10. Cab Height: 8'-0" standard
   11. Hoistway Entrance Size: 3' - 6" wide x 7'-0" high
   12. Door Type: Center Opening
   14. Seismic Requirements: Zone 1
15. Hoistway Dimensions: 8’ - 4” wide x 5’ - 9” deep
16. Pit Depth: 4’ - 0”
17. Button & Fixture Style: Signa4 Signal Fixtures
18. Special Operations: None