PROJECT MANUAL FOR

Riverview Junior High School Replacement

Project Location:
751 West Tripp Lane
Murray, Utah 84123

MURRAY CITY SCHOOL DISTRICT
We Are Murray!

Murray City School District
147 East 5065 South
Murray, Utah 84107

Bid Package 03
Bid Documents

Volume 1: Divisions 00 - 14; 31 - 33

March 31, 2025

BDK
BIG-D | KITCHELL
A JOINT VENTURE

naylor wentworth lund
architects

GENERAL CONTRACTORS
HUGHES
EST. 1958

SECTION 00 0103

PROJECT DIRECTORY

OWNER

Name: Murray City School District
Attention: Scott Taggert
Address: 5102 S. Commerce Drive, Murray, Utah 84107
Phone: (801) 264-7400

ARCHITECT

Name: Naylor Wentworth Lund Architects
Attention: Justin Nye, AIA
Address: 723 West Pacific Ave., Suite 101, Salt Lake City, Utah 84104
Phone: (801) 355-5959

CONSTRUCTION MANAGER/GENERAL CONTRACTOR

Name: Hughes General Contractors
Attention: Monica Hurst
Address: 900 North Redwood Road, North Salt Lake, Utah 84054
Phone: (801) 292-1411
Fax: (801) 295-0530

STRUCTURAL ENGINEER

Name: BHB Structural Engineering
Attention: Travis Brackus
Address: 2766 South Main Street, Salt Lake City, Utah 84115
Phone: (801) 355-5656

MECHANICAL ENGINEER

Name: Van Boerum and Frank Associates, Inc.
Attention: Meta Joles
Address: 181 East 5600 South, Murray, Utah 84107
Phone: (801) 530-3148

ELECTRICAL ENGINEER

Name: BNA Consulting Engineers
Attention: Drayton Bailey
Address: 635 South State Street, Salt Lake City, Utah 84111
Phone: (801) 523-2196

FOOD SERVICE CONSULTANT

Name: Jedrziewski Designs, L.L.C.
Attention: Ric Jedrziewski
Address: 1537 East Yale Avenue, Salt Lake City, Utah 84105
Phone: (801) 403-9073

CIVIL ENGINEER

Name: Meridian Engineering Inc.
Attention: Nichole Luthi
Address: 1628 West 11010 South, Suite 102, South Jordan, U 84095
Phone: (801) 394-4515

LANDSCAPE ARCHITECT

Name: J-U-B Engineers
Attention: Andrew Noorlander
Address: 392 E Winchester St, Salt Lake City, Utah 84107
Phone: (801) 886-9052

SECTION 00 0104

NOTICE TO CONTRACTORS

1.01 SALES TAX

A. Beginning January 1, 1996, the State of Utah provided an exemption from sales tax for construction materials purchased for public education. The exemption applies to all construction materials purchased by or on behalf of institutions of the public education system, provided the construction materials are clearly identified and installed or converted to real property which is owned by the public education institution.

B. It is the intent of the Owner to take advantage of the tax exemption on all construction material used in Riverview Junior High School Replacement - BP 03. The Owner can take advantage of this exemption by structuring its agreements with its Contractors and suppliers so that title to construction material passes from the supplier to the Owner or the Contractor (on behalf of the Owner) upon delivery to the construction site after this date.

1.02 COMPLIANCE WITH LABOR LAWS

A. All Contractors shall comply with all applicable Laws and Regulations relating to labor on Public Works in the State of Utah, including *U.S. Code Title 8 USC Sec.1324a. Utah Code Title 34 Chapter 30 and Title 13 Chapter 47*.

B. Specific References

1. The following references are included herein so that the Contractor shall be aware of specific requirements of these sections. Other Law sections are not shown herein, but this in no way relieves the Contractor of His obligation to comply with all Federal, State, and Local Labor Laws.

   a. ***U.S. Code Title 8 USC Sec. 1324a Unlawful Employment*** (1)(A) It is unlawful for a person or other entity - to hire, or to recruit or refer for a fee, for employment in the United States an alien knowing the alien is an unauthorized alien. (2) ***Continuing Employment*** - It is unlawful for a person or other entity, after hiring an alien for employment in accordance with paragraph (1) to continue to employ the alien n the United States knowing the alien is (or has become) an unauthorized alien with respect to such employment. (4) ***Use of Labor Through Contract*** - For purposes of this section, a person or other entity who uses a contract, subcontract, or exchange, entered into, renegotiated, or extended after November 6, 1986, to obtain the labor of an alien in the United States knowing that the alien is an unauthorized alien (as defined in subsection (h)(3) of this section) with respect ot performing such labor, shall be considered to have hired the alien for employment in the United States in violation of paragraph (1)(A).

   b. ***Ut Code 34-30-1. Citizens to be given preference*** - In employing workmen in the construction of public works by the state or any county or municipality, **or by persons contracting with** the state or any county or municipality, preferences shall be given citizens of the United States, or those having declared their intention of becoming citizens. In each contract for the construction of public works a provision shall be inserted to the effect that, if the provisions of this section are not complied with, **the contract shall be void**.

c. ***Ut Code 34-30-8. Forty-hour Work Week*** - Overtime at one and one-half regular rate. Forty hours shall constitute a working week on all works and undertakings carried on by the state, county, or municipal governments, or by any officer of the state or of any county or municipal government. Any persons, corporation, firm, contractor, agent, manager, or foreman, who shall require or contract with any person to work upon such works or undertakings longer than 40 hours in one week shall pay such employees at a rate not less than one and one-half times the regular rate at which he is employed. (Piece work rates have to be greater than or equal to minimum wage and one and one-half times minimum wage for hours worked over 40; minimum wage laws still apply.)

d. ***Ut Code 34-30-9. Violation of Chapter*** - Failure to keep or produce records - Misdemeanor. Any officer, agent or representative of the state, or of any political subdivision, district, or municipality of it who shall violate, or omit to comply with any of the provisions of this chapter, and any contractor or subcontractor, or agent or representative thereof, doing such public work, who shall neglect to keep, or cause to be kept, an accurate record of the names, occupation and actual wages paid to each laborer, workman and mechanic employed by him, in connection with this public work or who shall refuse to allow access to same at any reasonable hour to any person authorized ot inspect same under this chapter shall be guilty of a misdemeanor.

e. ***Ut Code 13-47-201. Verification required for new hires***. (1) A private employer who employs 15 or more employees as of July 1, 2010, may not hire a new employee on or after July 1, 2010, unless the private employer: (a) is registered with the status verification system to verify the federal legal working status of any new employee; and (b) uses the status verification system to verify the federal legal working status of the new employee in accordance with the requirements of the status verification system. (2) This section does not apply to a private employer of a foreign national if the foreign national holds a visa issued in response to a petition by the private employer that is classified as H-2A or H-2B.

1.03 EMPLOYEE DRUG TESTING

A. Effective July 1, 2010, a state public procurement unit may not enter into a state construction contract unless the contractor has and will maintain a drug and alcohol testing policy during the period of the state construction contract that applies to the covered individuals hired by the contractor. Refer to Utah Code - Title 63G, Chapter 6, Section 604: **(63G-6-604: Drug and alcohol testing required for state construction contracts)**. Therefore, the successful Contractor and all subcontractors working on the Riverview Junior High School Replacement - BP 03 must show that they have a mandatory drug and alcohol testing policy for their company.

1.04 SUBSTANTIAL COMPLETION TIME

A. It is agreed by the parties to the contract that if the contractor shall fail to complete his work on or before the date set for substantial completion, or extension thereof granted by the owner, damage will be sustained by the owner and that it is, and will be, impracticable and extremely difficult to fix the actual damage with the owner will sustain in the event of and by reason of such delays. It is, therefore, agreed that the contractor will pay the owner **liquidated damages** in the sum of $2,500.00 per calendar day exceeding the GMP defined Substantial Completion date. $2,500.00 per day for days exceeding the 30 days from Substantial to Final completion date. The contractor agrees that any sums which; may be due the owner as liquidated damages, may be deducted from any monies due, or to become due, the contractor under the contract or may be collected from the contractor's surety.

1. Refer to Bid Form for the date of substantial completion.

1.05 MANUFACTURERS AND PRODUCTS

A. This specification was prepared under the direction of the Owner with regard to adhering to their established standards. Although the items are the Owner's preferred choice, suppliers may bid other manufacturers as proposed substitutions for the Owner's review. The use of brand names in this specification manual is not intended to limit bidding competition, but to establish a level of quality, performance and characteristics desired.

B. **Deadline for Proposed Substitution Requests will be 72 hours prior to Bid Date. Refer to Section 01 6000 - Product Requirements.**

C. Note that substitutions for specified/approved products/manufacturers **will not** be reviewed if submitted as a part of submittal process.

D. Manufacturer's other than Basis of Design Manufacturers shall provide products or systems that meet or exceed Basis of Design products or systems. No change order shall be issued solely based on bid product or system not meeting Basis of Design and being rejected through submittal process.

END OF NOTICE TO CONTRACTORS

This page intentionally left blank

SECTION 00 0110

TABLE OF CONTENTS

DIVISION 00 -- PROCUREMENT AND CONTRACTING REQUIREMENTS

00 0101 - Title Page
00 0103 - Project Directory
00 0104 - Notice to Contractors
00 0110 - Index (Table of Contents)
00 1108 - AIA - A701 Instructions to Bidders
00 2213 - Supplementary Instructions to Bidders
00 4010 - AIA Document A132
00 4011 - AIA Document A132 Exhibit A
00 4011 - AIA Document A132 Exhibit B
00 4325 - Substitution Request Form
00 5500 - Notice to Proceed
00 6536 - Warranty Form
00 7200 - AIA Document A232 - 2019
00 7300 - Supplementary General Conditions
00 9500 - TC-721G - Tax Exempt Form

DIVISION 01 -- GENERAL REQUIREMENTS

01 2000 - Price and Payment Procedures
01 2020 - AIA - G732 Application and Certificate for Payment
01 2030 - AIA - G703 Continuation Sheet
01 2100 - Allowances
01 2200 - Unit Prices
01 2300 - Alternates
01 3000 - Administrative Requirements
01 3216 - Construction Progress Schedule
01 4000 - Quality Requirements
01 5000 - Temporary Facilities and Controls
01 5100 - Temporary Utilities
01 5639 - Tree Protection and Preservation
01 5713 - Temporary Erosion and Sediment Control
01 6000 - Product Requirements
01 6116 - Volatile Organic Compound (VOC) Content Restrictions
01 6116.01 - Accessory Material VOC Content Certification Form
01 7010 - AIA - G704 Certificate of Substantial Completion
01 7020 - AIA - G706 Affidavit of Payment
01 7030 - AIA - G706A Affidavit of Release of Liens
01 7040 - AIA - G707 Consent of Surety to Final Payment
01 7419 - Construction Waste Management and Disposal
01 7700 - Closeout Procedures
01 7800 - Closeout Submittals
01 7801 - Form of Guarantee/Warranty
01 7900 - Demonstration and Training

DIVISION 02 -- EXISTING CONDITIONS

02 4100 - Demolition

DIVISION 03 -- CONCRETE

03 1000 - Concrete Forming and Accessories
03 2000 - Reinforcing
03 3000 - Cast-in-Place Concrete
03 3515 - Dyed and Polished Concrete Floors
03 4500 - Precast Architectural Concrete
03 4713 - Tilt-Up Concrete

DIVISION 04 -- MASONRY

04 2001 - Masonry Veneer
04 2731 - Engineered Unit Masonry

DIVISION 05 -- METALS

05 1200 - Structural Steel Framing
05 2100 - Steel Joist Framing
05 3100 - Steel Decking
05 3400 - Acoustical Metal Decking
05 4000 - Cold-Formed Metal Framing
05 5000 - Metal Fabrications
05 5213 - Pipe and Tube Railings
05 7300 - Decorative Metal Railings

DIVISION 06 -- WOOD, PLASTICS, AND COMPOSITES

06 1000 - Rough Carpentry
06 4100 - Architectural Casework
06 6116 - Solid Surfacing Fabrications

DIVISION 07 -- THERMAL AND MOISTURE PROTECTION

07 1300 - Sheet Waterproofing
07 1900 - Exterior Water Repellents and Graffiti Resistant Sealers
07 2100 - Building Insulation
07 2119 - Foamed-In-Place Insulation
07 2129 - Sprayed Insulation
07 2500 - Membrane Weather Barriers
07 2600 - Under-Slab Vapor Barrier
07 4113 - Metal Roof Panels and Soffit Panels
07 4213 - Concealed Fastener Metal Wall Panels
07 4264 - Metal Composite Wall and Soffit Panels
07 5419 - PVC Thermoplastic Single-Ply Roofing
07 6200 - Sheet Metal Flashing and Trim
07 7200 - Roof Hatches and Accessories
07 8400 - Firestopping
07 9200 - Joint Sealants
07 9513 - Expansion Joint Cover Assemblies

DIVISION 08 -- OPENINGS

08 1113 - Hollow Metal Doors and Frames

08 1416 - Flush Wood Doors
08 3100 - Access Doors and Panels
08 3313 - Coiling Counter Doors
08 3323 - Overhead Coiling Doors
08 3326 - Overhead Coiling Grilles
08 4113.13 - Fire-Rated Aluminum-Framed Entrances
08 4413 - Glazed Aluminum Curtain Wall
08 4500 - Translucent Skylight Panel Assemblies
08 5659 - Interior Sliding Service Window
08 7100 - Door Hardware
08 8000 - Glazing
08 8100 - Glazed Wall System
08 8200 - Display Case Assemblies
08 8300 - Activity Mirrors

DIVISION 09 -- FINISHES

09 0561 - Common Work Results for Flooring Preparation
09 2116 - Gypsum Board Assemblies
09 2220 - Gypsum Board Metal Suspension Systems
09 2513 - Direct-Applied EFS
09 3000 - Tiling
09 5100 - Suspended Acoustical Ceilings
09 5153 - Direct-Applied Acoustical Ceilings
09 6413 - Wood Flooring
09 6466 - Wood Athletic Flooring
09 6500 - Resilient Flooring
09 6800 - Sheet Carpeting
09 6813 - Tile Carpeting
09 6819 - Entrance Flooring
09 7200 - Graphic Wall Covering
09 8400 - Acoustic Room Components
09 8405 - Ceiling Diffuser Panels
09 8413 - Cementitious Wood Fiber Acoustic Panels
09 9113 - Exterior Painting
09 9123 - Interior Painting
09 9724 - Sealers - Interior Concrete, Precast and Masonry Sealers

DIVISION 10 -- SPECIALTIES

10 1100 - Visual Display Units
10 1400 - Building and Site Signage
10 1463 - Marquee Message Center and Sign
10 2110 - Phenolic Toilet Compartments
10 2239 - Folding Panel Partitions
10 2601 - Wall and Corner Guards
10 2800 - Toilet, Bath, and Utility Accessories
10 4400 - Fire Protection Specialties
10 5100 - Metal Lockers
10 5613 - Metal Storage Shelving
10 7300 - Insulated Translucent Fiberglass Sandwich Panel Structural Canopy System
10 7500 - Flagpoles

DIVISION 11 -- EQUIPMENT

11 0600 - Stage Rigging and Lighting Control Systems
11 1616 - Security Safes
11 3100 - Residential Appliances
11 4000 - Foodservice Equipment
11 5300 - Laboratory Equipment
11 5413 - Kilns
11 5700 - Vocational Shop Equipment
11 6133 - Stage Rigging and Equipment
11 6143 - Stage Curtains
11 6623 - Gymnasium Equipment
11 6643 - Interior Electronic Scoreboards
11 6833 - Athletic Field Equipment
11 6844 - Exterior Electronic Softball Scoreboards
11 7910 - Changing Table

DIVISION 12 -- FURNISHINGS

12 3556 - Music Education Storage Casework
12 6100 - Fixed Audience Seating
12 6613 - Bleacher Seats
12 7000 - Telescoping Seating
12 9300 - Site Furnishings

DIVISION 13 -- SPECIAL CONSTRUCTION

13 3416 - Exterior Bleachers

DIVISION 14 -- CONVEYING EQUIPMENT

14 2400 - Hydraulic Elevators

DIVISION 31 -- EARTHWORK

31 0000 - Geotechnical Investigation
31 0001 - Geotechnical Study
31 1100 - Site Clearing
31 2000 - Earth Moving

DIVISION 32 -- EXTERIOR IMPROVEMENTS

32 0001 - Infield Mix for Softball
32 0002 - Batters Box Mix for Softball
32 0003 - Warning Track Mix for Softball
32 1216 - Hot Mix Asphalt Paving
32 1313 - Site Concrete
32 1373 - Concrete Paving Joint Sealants
32 1723 - Pavement Markings
32 3113 - Chain Link Fences and Gates
32 8423 - Irrigation - Traditional
32 9119 - Landscape Grading
32 9423 - Planting

DIVISION 33 -- UTILITIES

33 4100 - Storm Drainage System

This page intentionally left blank

AIA® Document A701™ – 1997

Instructions to Bidders

for the following PROJECT:
(Name and location or address)

THE OWNER:
(Name, legal status and address)

THE ARCHITECT:
(Name, legal status and address)
Naylor Wentworth Lund Architects
336 South 400 West
Salt Lake City, Utah 84101

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

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

TABLE OF ARTICLES

1 DEFINITIONS

2 BIDDER'S REPRESENTATIONS

3 BIDDING DOCUMENTS

4 BIDDING PROCEDURES

5 CONSIDERATION OF BIDS

6 POST-BID INFORMATION

7 PERFORMANCE BOND AND PAYMENT BOND

8 FORM OF AGREEMENT BETWEEN OWNER AND CONTRACTOR

AIA Document A701™ – 1997. Copyright © 1970, 1974, 1978, 1987 and 1997 by The American Institute of Architects. **All rights reserved.** WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law. This document was produced by AIA software at 15:34:40 on 03/14/2016 under Order No.5579111420_1 which expires on 12/19/2016, and is not for resale.
User Notes: (1332754770)

ARTICLE 1 DEFINITIONS

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

§ 1.2 Definitions set forth in the General Conditions of the Contract for Construction, AIA Document A201, or in other Contract Documents are applicable to the Bidding Documents.

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

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

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

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

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

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

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

ARTICLE 2 BIDDER'S REPRESENTATIONS

§ 2.1 The Bidder by making a Bid represents that:

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

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

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

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

ARTICLE 3 BIDDING DOCUMENTS

§ 3.1 COPIES

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

AIA Document A701™ – 1997. Copyright © 1970, 1974, 1978, 1987 and 1997 by The American Institute of Architects. **All rights reserved.** WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law. This document was produced by AIA software at 15:34:40 on 03/14/2016 under Order No.5579111420_1 which expires on 12/19/2016, and is not for resale.
User Notes: (1332754770)

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

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

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

§ 3.2 INTERPRETATION OR CORRECTION OF BIDDING DOCUMENTS

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

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

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

§ 3.3 SUBSTITUTIONS

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

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

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

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

§ 3.4 ADDENDA

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

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

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

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

AIA Document A701™ – 1997. Copyright © 1970, 1974, 1978, 1987 and 1997 by The American Institute of Architects. **All rights reserved.** WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law. This document was produced by AIA software at 15:34:40 on 03/14/2016 under Order No.5579111420_1 which expires on 12/19/2016, and is not for resale.
User Notes: (1332754770)

ARTICLE 4 BIDDING PROCEDURES

§ 4.1 PREPARATION OF BIDS

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

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

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

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

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

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

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

§ 4.2 BID SECURITY

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

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

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

§ 4.3 SUBMISSION OF BIDS

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

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

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

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

§ 4.4 MODIFICATION OR WITHDRAWAL OF BID

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

AIA Document A701™ – 1997. Copyright © 1970, 1974, 1978, 1987 and 1997 by The American Institute of Architects. **All rights reserved.** WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law. This document was produced by AIA software at 15:34:40 on 03/14/2016 under Order No.5579111420_1 which expires on 12/19/2016, and is not for resale.
User Notes: (1332754770)

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

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

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

ARTICLE 5 CONSIDERATION OF BIDS

§ 5.1 OPENING OF BIDS

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

§ 5.2 REJECTION OF BIDS

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

§ 5.3 ACCEPTANCE OF BID (AWARD)

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

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

ARTICLE 6 POST-BID INFORMATION

§ 6.1 CONTRACTOR'S QUALIFICATION STATEMENT

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

§ 6.2 OWNER'S FINANCIAL CAPABILITY

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

§ 6.3 SUBMITTALS

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

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

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

AIA Document A701™ – 1997. Copyright © 1970, 1974, 1978, 1987 and 1997 by The American Institute of Architects. **All rights reserved.** WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law. This document was produced by AIA software at 15:34:40 on 03/14/2016 under Order No.5579111420_1 which expires on 12/19/2016, and is not for resale.
User Notes: (1332754770)

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

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

ARTICLE 7 PERFORMANCE BOND AND PAYMENT BOND

§ 7.1 BOND REQUIREMENTS

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

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

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

§ 7.2 TIME OF DELIVERY AND FORM OF BONDS

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

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

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

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

ARTICLE 8 FORM OF AGREEMENT BETWEEN OWNER AND CONTRACTOR

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

AIA Document A701™ – 1997. Copyright © 1970, 1974, 1978, 1987 and 1997 by The American Institute of Architects. **All rights reserved.** WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law. This document was produced by AIA software at 15:34:40 on 03/14/2016 under Order No.5579111420_1 which expires on 12/19/2016, and is not for resale.
User Notes: (1332754770)

SECTION 00 2213

SUPPLEMENTARY INSTRUCTIONS TO BIDDERS

THE PROVISIONS CONTAINED HEREIN SHALL DELETE, MODIFY AND SUPPLEMENT THE PROVISIONS CONTAINED IN THE INSTRUCTIONS TO BIDDERS, AIA DOCUMENT A701, 2018 EDITION. WHERE A PORTION OF THE INSTRUCTIONS TO BIDDERS IS MODIFIED OR DELETED BY THESE SUPPLEMENTARY INSTRUCTIONS, THE REMAINING UNALTERED PORTIONS OF THE INSTRUCTIONS TO BIDDERS SHALL REMAIN IN AS IS.

ARTICLE 2 BIDDER'S REPRESENTATIONS

2.1 Bidder's Representations

Add New Subparagraph 2.1.5 as follows:

2.1.5 This bid has been arrived at independently, without consultation, communication or agreement as to any matter relating to this bid with any other bidder or with any competitor.

ARTICLE 3 BIDDING DOCUMENTS

3.2 Interpretation or Correction of Bidding Documents

Add New Sentence to Subparagraph 3.2.2 as follows:

3.2.2 After bids have been submitted, the bidder shall not assert that there was a misunderstanding concerning the quantities of work or of the nature of the Work to be done.

3.2.4 Should discrepancies or conflicts appear in the drawings or specifications which are not cleared up by the addenda, it will be assumed that the Contractor or Subcontractor has bid the project using the most expensive method shown on the drawings and as well as the most expensive material in the specifications.

3.2.5 It shall be the responsibility of each bidder to ascertain that he is in possession of a complete set of Contract Documents by comparing page numbers against indexes. Each bidder is responsible to review all Construction Documents such as drawings, specifications, addenda, etc.

3.3 Substitutions

Add New Subparagraph 3.3.2.1 as follows:

3.3.2.1 Unless listed in the Project Manual as an accepted substitution in specific section, amount for substitution whether addition or deduction from Base Bid amount shall be shown on the Bid Form where indicated.

1) Requests for Substitutons during the bidding period: Refer to Section 01 6000 Product Requirements

3.4 Addenda

Modify Subparagraph 3.4.1 as follows:

3.4.1 Addenda will be mailed, delivered, faxed, or emailed to all those who have paid a deposit for a complete set of bidding documents and to all listed plan rooms.

Omit Subparagraph 3.4.3 in its entirety.

ARTICLE 4 BIDDING PROCEDURES

4.1 Preparation of Bids

Modify Subparagraph 4.1.1 as follows:

4.1.1 Bids shall be submitted on forms identical to the forms included with the bidding documents. Only one copy of the bid is to be submitted.

Add New Subparagraph 4.1.8 as follows:

4.1.8 Beginning January 1, 1996, the State of Utah provided an exemption from sales tax for construction materials purchased for public education. The exemption applies to all construction materials purchased by or on behalf of institutions of the public education system, provided the construction materials are clearly identified and installed or converted to real property which is owned by the public education institution. It is the intent of the Murray City School District to take advantage of the tax exemption on all construction material used in the Project. The School District can take advantage of this exemption by structuring its agreements with its Contractor and Suppliers so that title to construction material passes from the supplier to the School District or the Contractor (on behalf of the School District) upon delivery to the construction site after January 1, 1996.

4.2 Bid Security

Add New Subparagraph 4.2.4 as follows:

4.2.4 Each bid shall be accompanied by a Certified or Cashier's Check or Bid Bond (AIA Document A310) for five percent (5%) of the amount of the bid, made payable to the order of Board of Education, Murray City School District , 5102 S Commerce Drive Murray, Utah 84107. The check or bond shall be in the form shown in the specifications and to be given as a guarantee that the bidder will enter into the contract if awarded to him and will be declared forfeited if the successful bidder refuses to enter into said contract after being requested to do so by the said board within a period of sixty (60) days.

4.3 Submission of Bids

Add new Subparagraph 4.3.5 as follows:

4.3.5 All applicable laws, ordinances, and the rules and regulations of all Authorities Having Jurisdiction over construction of the Project shall apply to the Contract throughout.

4.4 Modification or Withdrawal of Bid

Modify Subparagraph 4.4.1 as follows:

4.4.1 No bidder may withdraw a bid within 60 days after the actual date of the opening thereof. Should there be reasons why the Contract cannot be awarded within the specified period, the time may be extended by mutual agreement between the Owner and the bidder.

ARTICLE 5 CONSIDERATION OF BIDS

5.2 Rejection of Bids

Add new Subparagraph 5.2.2 as follows:

5.2.2 The General Contractor may make such investigations as deemed necessary to determine the ability of the bidder to perform the Work and the bidder shall furnish to the Owner all such information and data for this purpose as the Owner may request. The Owner reserves the right to reject any bid if the evidence submitted by, or investigation of such bidder, fails to satisfy the Owner that such bidder is properly qualified to carry out the obligations of the agreement and to complete the Work contemplated therein.

5.3 Acceptance of Bids (Award)

Substitute the words "minor defects" for the word "irregularities" in Subparagraph 5.3.1.

Modify Subparagraph 5.3.2 as follows:

5.3.2 The owner shall have the right to accept alternates in the sequence listed and to determine the low bidder on the basis of the sum of the base bid and the alternates accepted.

ARTICLE 7 PERFORMANCE AND PAYMENT BOND

7.1 Bond Requirements

Modify Subparagraph 7.1.1 as follows:

7.1.1 Prior to execution of the Contract, the bidder shall furnish bonds covering the faithful performance of the Contract and the payments of all obligations arising there under in such form and amount as the Owner may prescribe.

7.2 Time of Delivery and Form of Bonds

Modify Subparagraph 7.2.1 as follows:

7.2.1 The party to whom the Contract is awarded will be required to execute the agreement within ten (10) calendar days from the date when Notice of Award is delivered to the bidder. The Notice of Award shall be accompanied by the necessary agreement and bond forms.

ARTICLE 8 FORM OF AGREEMENT BETWEEN OWNER AND CONTRACTOR

Modify existing Paragraph as follows:

Contractors shall be aware that the agreement for the work shall be written as a change order to the General Contractor's contract and they will be bound to their requirements for schedule, payments, etc.

END OF SUPPLEMENTARY INSTRUCTIONS TO BIDDERS

This page intentionally left blank

AIA® Document A132® – 2019

Standard Form of Agreement Between Owner and Contractor, Construction Manager as Adviser Edition

AGREEMENT made as of the Twenty-fourth day of June in the year Two-Thousand Twenty-Four
(In words, indicate day, month, and year.)

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

Murray City School District
5002 S Commerce Dr
Murray, UT 84107

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

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

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

BDK A Joint Venture
404 West 400 South
Salt Lake City, UT 84101

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

The Owner and Contractor agree as follows.

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

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

This document is intended to be used in conjunction with AIA Documents A232™–2019, General Conditions of the Contract for Construction, Construction Manager as Adviser Edition; B132™–2019, Standard Form of Agreement Between Owner and Architect, Construction Manager as Adviser Edition; and C132™–2019, Standard Form of Agreement Between Owner and Construction Manager as Adviser. AIA Document A232™–2019 is adopted in this document by reference. Do not use with other general conditions unless this document is modified.

Init.
/
AIA Document A132 – 2019. Copyright © 1975, 1980, 1992, 2009, and 2019. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 18:27:25 ET on 07/02/2024 under Order No.4104248073 which expires on 01/07/2025, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (1431334764)

TABLE OF ARTICLES

1 THE CONTRACT DOCUMENTS

2 THE WORK OF THIS CONTRACT

3 DATE OF COMMENCEMENT AND DATES OF SUBSTANTIAL COMPLETION

4 CONTRACT SUM

5 PAYMENTS

6 DISPUTE RESOLUTION

7 TERMINATION OR SUSPENSION

8 MISCELLANEOUS PROVISIONS

9 ENUMERATION OF CONTRACT DOCUMENTS

EXHIBIT A INSURANCE AND BONDS
EXHIBIT B DETERMINATION OF THE COST OF THE WORK

ARTICLE 1 THE CONTRACT DOCUMENTS

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

ARTICLE 2 THE WORK OF THIS CONTRACT

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

ARTICLE 3 DATE OF COMMENCEMENT AND DATES OF SUBSTANTIAL COMPLETION

§ 3.1 The date of commencement of the Work shall be:
(Check one of the following boxes.)

[ ] The date of this Agreement.

[X] A date set forth in a notice to proceed issued by the Owner.

[ ] Established as follows:
(Insert a date or a means to determine the date of commencement of the Work.)

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

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

§ 3.3 Substantial Completion of the Project or Portions Thereof

§ 3.3.1 Subject to adjustments of the Contract Time as provided in the Contract Documents, the date of Substantial Completion of the Work of all of the Contractors for the Project will be:
(Insert the date of Substantial Completion of the Work of all Contractors for the Project.)

Init.
/

AIA Document A132 – 2019. Copyright © 1975, 1980, 1992, 2009, and 2019. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 18:27:25 ET on 07/02/2024 under Order No.4104248073 which expires on 01/07/2025, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes:
(1431334764)

Actual date of Substantial Completion to be determined at time of acceptance of GMP. Projected date is June 1, 2027.

§ 3.3.2 Subject to adjustments of the Contract Time as provided in the Contract Documents, if portions of the Work of all of the Contractors for the Project are to be completed prior to Substantial Completion of the entire Work of all of the Contractors for the Project, the Contractors shall achieve Substantial Completion of such portions by the following dates:

Portion of Work	Substantial Completion Date

§ 3.4 When the Work of this Contract, or any Portion Thereof, is Substantially Complete

§ 3.4.1 Subject to adjustments of the Contract Time as provided in the Contract Documents, the Contractor shall substantially complete the entire Work of this Contract:
(Check one of the following boxes and complete the necessary information.)

[ ] Not later than ( ) calendar days from the date of commencement of the Work.

[ ] By the following date:

§ 3.4.2 Subject to adjustments of the Contract Time as provided in the Contract Documents, if portions of the Work of this Contract are to be substantially complete prior to when the entire Work of this Contract shall be substantially complete, the Contractor shall substantially complete such portions by the following dates:

Portion of Work	Date to be substantially complete

§ 3.4.3 If the Contractor fails to substantially complete the Work of this Contract, or portions thereof, as provided in this Section 3.4, liquidated damages, if any, shall be assessed as set forth in Section 4.5.

ARTICLE 4 CONTRACT SUM

§ 4.1 The Owner shall pay the Contractor the Contract Sum in current funds for the Contractor's performance of the Contract. The Contract Sum shall be one of the following:
(Check the appropriate box.)

[ ] Stipulated Sum, in accordance with Section 4.2 below

[ ] Cost of the Work plus the Contractor's Fee, in accordance with Section 4.3 below

[X] Cost of the Work plus the Contractor's Fee with a Guaranteed Maximum Price, in accordance with Section 4.4 below

(Based on the selection above, complete Section 4.2, 4.3 or 4.4 below.)

§ 4.2 Stipulated Sum

§ 4.2.1 The Contract Sum shall be ($), subject to additions and deductions as provided in the Contract Documents.

§ 4.2.2 Alternates

§ 4.2.2.1 Alternates, if any, included in the Contract Sum:

Item	Price

§ 4.2.2.2 Subject to the conditions noted below, the following alternates may be accepted by the Owner following execution of this Agreement. Upon acceptance, the Owner shall issue a Modification to this Agreement.
(Insert below each alternate and the conditions that must be met for the Owner to accept the alternate.)

AIA Document A132 – 2019. Copyright © 1975, 1980, 1992, 2009, and 2019. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 18:27:25 ET on 07/02/2024 under Order No.4104248073 which expires on 01/07/2025, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes:
(1431334764)

Item	Price	Conditions for Acceptance

§ 4.2.3 Allowances, if any, included in the Contract Sum:
(Identify each allowance.)

Item	Price

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

Item	Units and Limitations	Price per Unit ($0.00)

§ 4.3 Cost of the Work Plus Contractor's Fee without a Guaranteed Maximum Price
§ 4.3.1 The Cost of the Work is as defined in Exhibit B, Determination of the Cost of the Work.

§ 4.3.2 The Contractor's Fee:
(State a lump sum, percentage of Cost of the Work or other provision for determining the Contractor's Fee.)

§ 4.3.3 The method of adjustment of the Contractor's Fee for changes in the Work:

§ 4.3.4 Limitations, if any, on a Subcontractor's overhead and profit for increases in the cost of its portion of the Work:

§ 4.3.5 Rental rates for Contractor-owned equipment shall not exceed percent (%) of the standard rental rate paid at the place of the Project.

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

Item	Units and Limitations	Price per Unit ($0.00)

§ 4.3.7 The Contractor shall prepare and submit to the Construction Manager, within 14 days of executing this Agreement, a written Control Estimate for the Owner's review and approval. The Control Estimate shall include the items in Section B.1 of Exhibit B, Determination of the Cost of the Work.

§ 4.4 Cost of the Work Plus Contractor's Fee with a Guaranteed Maximum Price
§ 4.4.1 The Cost of the Work is as defined in Exhibit B, Determination of the Cost of the Work.

§ 4.4.2 The Contractor's Fee:
(State a lump sum, percentage of Cost of the Work or other provision for determining the Contractor's Fee.)

A. The GMP and bid packages shall be determined as _% of the Cost of the Work to be finalized into a lump sum at time of GMP, and individual bid packages. This fee amount will be calculated using the fee percentage of the Cost of the Work solely and not including the GMP fee itself or the costs of required insurances and bonds.
B. The Contractor's preconstruction fee shall be $_ as a lump sum.

§ 4.4.3 The method of adjustment of the Contractor's Fee for changes in the Work:

AIA Document A132 – 2019. Copyright © 1975, 1980, 1992, 2009, and 2019. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 18:27:25 ET on 07/02/2024 under Order No.4104248073 which expires on 01/07/2025, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (1431334764)

Contractor Fee shall adjust for work added at _% of the Cost of the Work for items added to the overall Contract. Items adjusted for the scope of the work utilizing the contract contractor's and owner's contingency established at the time of GMP hall be included as part of the Cost of work, marked up at time of GMP and therefor will not be adjusted for further fee.

§ 4.4.4 Limitations, if any, on a Subcontractor's overhead and profit for increases in the cost of its portion of the Work:

Subcontractors overhead and profit shall be no greater than _% of the cost of its portion of the work.

§ 4.4.5 Rental rates for Contractor-owned equipment shall not exceed percent (%) of the standard rental rate paid at the place of the Project.

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

Item	Units and Limitations	Price per Unit ($0.00)
TBD		

§ 4.4.7 Guaranteed Maximum Price
§ 4.4.7.1 The Contract Sum is guaranteed by the Contractor not to exceed ($), subject to additions and deductions by Change Order as provided in the Contract Documents. This maximum sum is referred to in the Contract Documents as the Guaranteed Maximum Price. Costs which would cause the Guaranteed Maximum Price to be exceeded shall be paid by the Contractor without reimbursement by the Owner.

§ 4.4.7.2 Alternates
§ 4.4.7.2.1 Alternates, if any, included in the Guaranteed Maximum Price:

Item	Price
TBD	

§ 4.4.7.2.2 Subject to the conditions noted below, the following alternates may be accepted by the Owner following execution of this Agreement. Upon acceptance, the Owner shall issue a Modification to this Agreement.
(Insert below each alternate and the conditions that must be met for the Owner to accept the alternate.)

Item	Price	Conditions for Acceptance
TBD		

§ 4.4.7.3 Allowances, if any, included in the Guaranteed Maximum Price:
(Identify each allowance.)

Item	Price
TBD	

§ 4.4.7.4 Assumptions, if any, upon which the Guaranteed Maximum Price is based:
(Identify each assumption.)

TBD

§ 4.4.8 To the extent that the Contract Documents are anticipated to require further development, the Guaranteed Maximum Price includes the costs attributable to such further development consistent with the Contract Documents and reasonably inferable therefrom. Such further development does not include changes in scope, systems, kinds and quality of materials, finishes, or equipment, all of which, if required, shall be incorporated by Change Order.

§ 4.4.9 The Owner shall authorize preparation of revisions to the Contract Documents that incorporate the agreed-upon assumptions contained in Section 4.4.7.4. The Owner shall promptly furnish such revised Contract Documents to the Contractor. The Contractor shall notify the Owner and Architect of any inconsistencies between the agreed-upon assumptions contained in Section 4.4.7.4 and the revised Contract Documents.

Init.
/
AIA Document A132 – 2019. Copyright © 1975, 1980, 1992, 2009, and 2019. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 18:27:25 ET on 07/02/2024 under Order No.4104248073 which expires on 01/07/2025, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (1431334764)

§ 4.5 Liquidated damages, if any:
(Insert terms and conditions for liquidated damages, if any, to be assessed in accordance with Section 3.4.)

$2,500.00 per calendar day exceeding the GMP defined Substantial Completion date. $2,500 per day for days exceeding the 30 days from Substantial to Final completion date.

§ 4.6 Other:
(Insert provisions for bonus, cost savings or other incentives, if any, that might result in a change to the Contract Sum.)

None

ARTICLE 5 PAYMENTS

§ 5.1 Progress Payments

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

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

§ 5.1.3 Provided that an Application for Payment is received by the Construction Manager not later than the twenty-fith day of a month, the Owner shall make payment of the amount certified to the Contractor not later than the tenth day of the following month. If an Application for Payment is received by the Construction Manager after the application date fixed above, payment of the amount certified shall be made by the Owner not later than thirty (30) days after the Construction Manager receives the Application for Payment.
(Federal, state or local laws may require payment within a certain period of time.)

§ 5.1.4 Progress Payments Where the Contract Sum is Based on a Stipulated Sum

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

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

§ 5.1.4.3 In accordance with AIA Document A232™–2019, General Conditions of the Contract for Construction, Construction Manager as Adviser Edition, and subject to other provisions of the Contract Documents, the amount of each progress payment shall be computed as follows:

§ 5.1.4.3.1 The amount of each progress payment shall first include:

.1 That portion of the Contract Sum properly allocable to completed Work;

.2 That portion of the Contract Sum properly allocable to materials and equipment delivered and suitably stored at the site for subsequent incorporation in the completed construction, or, if approved in advance by the Owner, suitably stored off the site at a location agreed upon in writing; and

.3 That portion of Construction Change Directives that the Architect determines, in the Architect's professional judgment, to be reasonably justified.

§ 5.1.4.3.2 The amount of each progress payment shall then be reduced by:

.1 The aggregate of any amounts previously paid by the Owner;

.2 The amount, if any, for Work that remains uncorrected and for which the Architect has previously withheld a Certificate for Payment as provided in Article 9 of AIA Document A232–2019;

AIA Document A132 – 2019. Copyright © 1975, 1980, 1992, 2009, and 2019. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 18:27:25 ET on 07/02/2024 under Order No.4104248073 which expires on 01/07/2025, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (1431334764)

.3 Any amount for which the Contractor does not intend to pay a Subcontractor or material supplier, unless the Work has been performed by others the Contractor intends to pay;

.4 For Work performed or defects discovered since the last payment application, any amount for which the Architect may withhold payment, or nullify a Certificate of Payment in whole or in part, as provided in Article 9 of AIA Document A232–2019; and

.5 Retainage withheld pursuant to Section 5.1.7.

§ 5.1.5 Progress Payments Where the Contract Sum is Based on the Cost of the Work without a Guaranteed Maximum Price

§ 5.1.5.1 With each Application for Payment, the Contractor shall submit the cost control information required in Exhibit B, Determination of the Cost of the Work, along with payrolls, petty cash accounts, receipted invoices, or invoices with check vouchers attached, and any other evidence required by the Owner, Construction Manager or Architect to demonstrate that payments already made by the Contractor on account of the Cost of the Work equal or exceed progress payments already received by the Contractor, plus payrolls for the period covered by the present Application for Payment, less that portion of the payments attributable to the Contractor's Fee.

§ 5.1.5.2 Applications for Payment shall show the Cost of the Work actually incurred by the Contractor through the end of the period covered by the Application for Payment and for which the Contractor has made or intends to make actual payment prior to the next Application for Payment.

§ 5.1.5.3 In accordance with AIA Document A232-2019 and subject to other provisions of the Contract Documents, the amount of each progress payment shall be computed as follows:

§ 5.1.5.3.1 The amount of each progress payment shall first include:

.1 The Cost of the Work as described in Exhibit B, Determination of the Cost of the Work;

.2 That portion of Construction Change Directives that the Architect determines, in the Architect's professional judgment, to be reasonably justified; and

.3 The Contractor's Fee computed upon the Cost of the Work described in the preceding Section 5.1.5.3.1.1 at the rate stated in Section 4.3.2; or if the Contractor's Fee is stated as a fixed sum in Section 4.3.2 an amount which bears the same ratio to that fixed-sum Fee as the Cost of the Work included in Section 5.1.5.3.1.1 bears to a reasonable estimate of the probable Cost of the Work upon its completion.

§ 5.1.5.3.2 The amount of each progress payment shall then be reduced by:

.1 The aggregate of any amounts previously paid by the Owner;

.2 The amount, if any, for Work that remains uncorrected and for which the Architect has previously withheld a Certificate for Payment as provided in Article 9 of AIA Document A232–2019;

.3 Any amount for which the Contractor does not intend to pay a Subcontractor or material supplier, unless the Work has been performed by others the Contractor intends to pay;

.4 For Work performed or defects discovered since the last payment application, any amount for which the Architect may withhold payment, or nullify a Certificate of Payment in whole or in part, as provided in Article 9 of AIA Document A232–2019;

.5 The shortfall, if any, indicated by the Contractor in the documentation required by Section 5.1.5.1 to substantiate prior Applications for Payment, or resulting from errors subsequently discovered by the Owner's auditors in such documentation; and

.6 Retainage withheld pursuant to Section 5.1.7.

§ 5.1.5.4 The Owner, Construction Manager and Contractor shall agree upon a mutually acceptable procedure for review and approval of payments to Subcontractors and the percentage of retainage held on Subcontracts, and the Contractor shall execute subcontracts in accordance with those agreements.

§ 5.1.5.5 In taking action on the Contractor's Applications for Payment, the Construction Manager and Architect shall be entitled to rely on the accuracy and completeness of the information furnished by the Contractor, and such action shall not be deemed to be a representation that (1) the Construction Manager and Architect have made a detailed examination, audit or arithmetic verification of the documentation submitted in accordance with Article 5 or other supporting data; (2) that the Construction Manager and Architect have made exhaustive or continuous on-site inspections; or (3) that the Construction Manager and Architect have made examinations to ascertain how or for what purposes the Contractor has

AIA Document A132 – 2019. Copyright © 1975, 1980, 1992, 2009, and 2019. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 18:27:25 ET on 07/02/2024 under Order No.4104248073 which expires on 01/07/2025, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (1431334764)

used amounts previously paid on account of the Contract. Such examinations, audits and verifications, if required by the Owner, will be performed by the Owner's auditors acting in the sole interest of the Owner.

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

§ 5.1.5.7 If final completion of the Work is materially delayed through no fault of the Contractor, then the Owner shall pay the Contractor any additional amounts in accordance with Article 9 of AIA Document A232-2019.

§ 5.1.6 Progress Payments Where the Contract Sum is Based on the Cost of the Work with a Guaranteed Maximum Price

§ 5.1.6.1 With each Application for Payment, the Contractor shall submit payrolls, petty cash accounts, receipted invoices or invoices with check vouchers attached, and any other evidence required by the Owner, Construction Manager or Architect to demonstrate that payments already made by the Contractor on account of the Cost of the Work equal or exceed progress payments already received by the Contractor plus payrolls for the period covered by the present Application for Payment, less that portion of the progress payments attributable to the Contractor's Fee.

§ 5.1.6.2 Each Application for Payment shall be based on the most recent schedule of values submitted by the Contractor in accordance with the Contract Documents. The schedule of values shall allocate the entire Guaranteed Maximum Price among: (1) the various portions of the Work; (2) any contingency for costs that are included in the Guaranteed Maximum Price but not otherwise allocated to another line item or included in a Change Order; and (3) the Contractor's Fee.

§ 5.1.6.2.1 The schedule of values shall be prepared in such form, and supported by such data to substantiate its accuracy, as the Construction Manager and Architect may require. This schedule of values shall be used as a basis for reviewing the Contractor's Applications for Payment.

§ 5.1.6.2.2 The allocation of the Guaranteed Maximum Price under this Section 5.1.6.2 shall not constitute a separate guaranteed maximum price for the Cost of the Work of each individual line item in the schedule of values.

§ 5.1.6.2.3 When the Contractor allocates costs from a contingency to another line item in the schedule of values, the Contractor shall submit supporting documentation to the Architect and Construction Manager.

§ 5.1.6.3 Applications for Payment shall show the percentage of completion of each portion of the Work as of the end of the period covered by the Application for Payment. The percentage of completion shall be the lesser of (1) the percentage of that portion of the Work which has actually been completed; or (2) the percentage obtained by dividing (a) the expense that has actually been incurred by the Contractor on account of that portion of the Work and for which the Contractor has made payment or intends to make payment prior to the next Application for Payment by (b) the share of the Guaranteed Maximum Price allocated to that portion of the Work in the schedule of values.

§ 5.1.6.4 In accordance with AIA Document A232-2019, and subject to other provisions of the Contract Documents, the amount of each progress payment shall be computed as follows:

§ 5.1.6.4.1 The amount of each progress payment shall first include:

.1 That portion of the Guaranteed Maximum Price properly allocable to completed Work as determined by multiplying the percentage of completion of each portion of the Work by the share of the Guaranteed Maximum Price allocated to that portion of the Work in the most recent schedule of values;

.2 That portion of the Guaranteed Maximum Price properly allocable to materials and equipment delivered and suitably stored at the site for subsequent incorporation in the completed construction or, if approved in writing in advance by the Owner, suitably stored off the site at a location agreed upon in writing;

.3 That portion of Construction Change Directives that the Architect determines, in the Architect's professional judgment, to be reasonably justified; and

.4 The Contractor's Fee, computed upon the Cost of the Work described in the preceding Sections 5.1.6.4.1.1 and 5.1.6.4.1.2 at the rate stated in Section 4.4.2 or, if the Contractor's Fee is stated as a fixed sum in that Section, an amount that bears the same ratio to that fixed-sum fee as the Cost of the Work included in Sections 5.1.6.4.1.1 and 5.1.6.4.1.2 bears to a reasonable estimate of the probable Cost of the Work upon its completion.

Init.
/
AIA Document A132 – 2019. Copyright © 1975, 1980, 1992, 2009, and 2019. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 18:27:25 ET on 07/02/2024 under Order No.4104248073 which expires on 01/07/2025, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes:
(1431334764)

§ 5.1.6.4.2 The amount of each progress payment shall then be reduced by:

.1 The aggregate of any amounts previously paid by the Owner;

.2 The amount, if any, for Work that remains uncorrected and for which the Architect has previously withheld a Certificate for Payment as provided in Article 9 of AIA Document A232–2019;

.3 Any amount for which the Contractor does not intend to pay a Subcontractor or material supplier, unless the Work has been performed by others the Contractor intends to pay;

.4 For Work performed or defects discovered since the last payment application, any amount for which the Architect may withhold payment, or nullify a Certificate of Payment in whole or in part, as provided in Article 9 of AIA Document A232–2019;

.5 The shortfall, if any, indicated by the Contractor in the documentation required by Section 5.1.6.1 to substantiate prior Applications for Payment, or resulting from errors subsequently discovered by the Owner's auditors in such documentation; and

.6 Retainage withheld pursuant to Section 5.1.7.

§ 5.1.6.5 The Owner and the Contractor shall agree upon a mutually acceptable procedure for review and approval of payments to Subcontractors and the percentage of retainage held on Subcontracts, and the Contractor shall execute subcontracts in accordance with those agreements.

§ 5.1.6.6 In taking action on the Contractor's Applications for Payment, the Construction Manager and Architect shall be entitled to rely on the accuracy and completeness of the information furnished by the Contractor and such action shall not be deemed to be a representation that (1) the Construction Manager or Architect have made a detailed examination, audit, or arithmetic verification of the documentation submitted in accordance with Section 5.1.6.1 or other supporting data; (2) that the Construction Manager or Architect have made exhaustive or continuous on-site inspections; or (3) that the Construction Manager or Architect have made examinations to ascertain how or for what purposes the Contractor has used amounts previously paid on account of the Contract. Such examinations, audits, and verifications, if required by the Owner, will be performed by the Owner's auditors acting in the sole interest of the Owner.

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

§ 5.1.6.8 If final completion of the Work is materially delayed through no fault of the Contractor, then the Owner shall pay the Contractor any additional amounts in accordance with Article 9 of AIA Document A232-2019.

§ 5.1.7 Retainage

§ 5.1.7.1 For each progress payment made prior to when the Work of this Contract is substantially complete, the Owner may withhold the following amount, as retainage, from the payment otherwise due:
(Insert a percentage or amount to be withheld as retainage from each Application for Payment. The amount of retainage may be limited by governing law.)

5%

§ 5.1.7.1.1 The following items are not subject to retainage:
(Insert any items not subject to the withholding of retainage, such as general conditions, insurance, etc.)

Insurances and bonds are not subject to withholding of retainage.

§ 5.1.7.2 Reduction or limitation of retainage, if any, shall be as follows:
(If the retainage established in Section 5.1.7.1 is to be modified prior to when the entire Work of this Contract is substantially complete, including modifications for completion of portions of the Work as provided in Section 3.4.2, insert provisions for such modifications.)

§ 5.1.7.3 Except as set forth in this Section 5.1.7.3, when the Work of this Contract is substantially complete, the Contractor may submit an Application for Payment that includes the retainage withheld from prior Applications for Payment pursuant to this Section 5.1.7. The Application for Payment submitted when the Work of this Contract is substantially complete shall not include retainage as follows:

Init.
/
AIA Document A132 – 2019. Copyright © 1975, 1980, 1992, 2009, and 2019. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 18:27:25 ET on 07/02/2024 under Order No.4104248073 which expires on 01/07/2025, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (1431334764)

(Insert any other conditions for release of retainage when the Work of this Contract is substantially complete, or upon Substantial Completion of the Work of all Contractors on the Project or portions thereof.)

Remaining retainage will be held until Final completion.

§ 5.2 Final Payment

§ 5.2.1 Final Payment Where the Contract Sum is Based on a Stipulated Sum

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

.1 the Contractor has fully performed the Contract except for the Contractor's responsibility to correct Work as provided in Article 12 of AIA Document A232–2019, and to satisfy other requirements, if any, which extend beyond final payment; and

.2 a final Certificate for Payment or Project Certificate for Payment has been issued by the Architect.

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

§ 5.2.2 Final Payment Where the Contract Sum is Based on the Cost of the Work with or without a Guaranteed Maximum Price

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

.1 the Contractor has fully performed the Contract except for the Contractor's responsibility to correct Work as provided in Article 12 of AIA Document A232–2019, and to satisfy other requirements, if any, which extend beyond final payment;

.2 the Contractor has submitted a final accounting for the Cost of the Work, pursuant to Exhibit B, Determination of the Cost of the Work and a final Application for Payment; and

.3 a final Certificate for Payment or Project Certificate for Payment has been issued by the Architect in accordance with Exhibit B, Determination of the Cost of the Work.

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

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

12 % per annum

ARTICLE 6 DISPUTE RESOLUTION

§ 6.1 Initial Decision Maker

The Architect will serve as Initial Decision Maker pursuant to Article 15 of AIA Document A232–2019, unless the parties appoint below another individual, not a party to this Agreement, to serve as Initial Decision Maker.
(If the parties mutually agree, insert the name, address and other contact information of the Initial Decision Maker, if other than the Architect.)

Chris Kartchner
400 W 400 S
Salt Lake City, UT 84101

§ 6.2 Binding Dispute Resolution

For any Claim subject to, but not resolved by, mediation pursuant to Article 15 of AIA Document A232–2019, the method of binding dispute resolution shall be as follows:
(Check the appropriate box.)

AIA Document A132 – 2019. Copyright © 1975, 1980, 1992, 2009, and 2019. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 18:27:25 ET on 07/02/2024 under Order No.4104248073 which expires on 01/07/2025, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (1431334764)

[X] Arbitration pursuant to Article 15 of AIA Document A232–2019.

[ ] Litigation in a court of competent jurisdiction.

[ ] Other: *(Specify)*

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

ARTICLE 7 TERMINATION OR SUSPENSION

§ 7.1 Where the Contract Sum is a Stipulated Sum

§ 7.1.1 The Contract may be terminated by the Owner or the Contractor as provided in Article 14 of AIA Document A232–2019.

§ 7.1.1.1 If the Contract is terminated for the Owner's convenience in accordance with Article 14 of AIA Document A232–2019, then the Owner shall pay the Contractor a termination fee as follows:
(Insert the amount of, or method for determining, the fee, if any, payable to the Contractor following a termination for the Owner's convenience.)

§ 7.1.2 The Work may be suspended by the Owner as provided in Article 14 of AIA Document A232–2019.

§ 7.2 Where the Contract Sum is Based on the Cost of the Work with or without a Guaranteed Maximum Price

§ 7.2.1 Termination

§ 7.2.1.1 The Contract may be terminated by the Owner or the Contractor as provided in Article 14 of AIA Document A232–2019.

§ 7.2.1.2 Termination by the Owner for Cause

§ 7.2.1.2.1 If the Owner terminates the Contract for cause as provided in Article 14 of AIA Document A232–2019, the Owner shall then only pay the Contractor an amount as follows:

.1 Take the Cost of the Work incurred by the Contractor to the date of termination;

.2 Add the Contractor's Fee, computed upon the Cost of the Work to the date of termination at the rate stated in Section 4.3.2 or 4.4.2, as applicable, or, if the Contractor's Fee is stated as a fixed sum in that Section, an amount that bears the same ratio to that fixed-sum Fee as the Cost of the Work at the time of termination bears to a reasonable estimate of the probable Cost of the Work upon its completion;

.3 Subtract the aggregate of previous payments made by the Owner; and

.4 Subtract the costs and damages incurred, or to be incurred, by the Owner under Article 14 of AIA Document A232–2019.

§ 7.2.1.2.2 When the Contract Sum is based on the Cost of the Work with a Guaranteed Maximum Price, if the Owner terminates the Contract for cause as provided in Article 14 of AIA Document A232-2019, the amount, if any, to be paid to the Contractor under Article 14 of AIA Document A232-2019 shall not cause the Guaranteed Maximum Price to be exceeded, nor shall it exceed the amount calculated in Section 7.2.1.2.1.

§ 7.2.1.2.3 The Owner shall also pay the Contractor fair compensation, either by purchase or rental at the election of the Owner, for any equipment owned by the Contractor that the Owner elects to retain and that is not otherwise included in the Cost of the Work under Section 7.2.1.2.1.1. To the extent that the Owner elects to take legal assignment of subcontracts and purchase orders (including rental agreements), the Contractor shall, as a condition of receiving the payments referred to in this Article 7, execute and deliver all such papers and take all such steps, including the legal assignment of such subcontracts and other contractual rights of the Contractor, as the Owner may require for the purpose of fully vesting in the Owner the rights and benefits of the Contractor under such subcontracts or purchase orders. All Subcontracts,

Init. /

AIA Document A132 – 2019. Copyright © 1975, 1980, 1992, 2009, and 2019. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 18:27:25 ET on 07/02/2024 under Order No.4104248073 which expires on 01/07/2025, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (1431334764)

purchase orders and rental agreements entered into by the Contractor will contain provisions allowing for assignment to the Owner as described above.

§ 7.2.1.3 Termination by the Owner for Convenience

If the Owner terminates the Contract for convenience in accordance with Article 14 of AIA Document A232–2019, then the Owner shall pay the Contractor a termination fee as follows:

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

No termination fee will be paid.

§ 7.3 Suspension

The Work may be suspended by the Owner as provided in Article 14 of AIA Document A232–2019; in such case, the Contract Sum and Contract Time shall be increased as provided in Article 14 of AIA Document A232–2019, except that the term "profit" shall be understood to mean the Contractor's Fee as described in Section 4.3.2 or 4.4.2, as applicable, of this Agreement.

ARTICLE 8 MISCELLANEOUS PROVISIONS

§ 8.1 Where reference is made in this Agreement to a provision of AIA Document A232–2019 or another Contract Document, the reference refers to that provision as amended or supplemented by other provisions of the Contract Documents.

§ 8.2 The Owner's representative:

(Name, address, email address, and other information)

§ 8.3 The Contractor's representative:

(Name, address, email address, and other information)

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

§ 8.5 Insurance and Bonds

§ 8.5.1 The Owner and the Contractor shall purchase and maintain insurance as set forth in AIA Document A132™–2019, Standard Form of Agreement Between Owner and Contractor, Construction Manager as Adviser Edition, Exhibit A, Insurance and Bonds, and elsewhere in the Contract Documents.

§ 8.5.2 The Contractor shall provide bonds as set forth in AIA Document A132™–2019, Exhibit A, and elsewhere in the Contract Documents.

§ 8.6 Notice in electronic format, pursuant to Article 1 of AIA Document A232–2019, may be given in accordance with a building information modeling exhibit, if completed, or as otherwise set forth below:

(If other than in accordance with a building information modeling exhibit, insert requirements for delivering notice in electronic format such as name, title, and email address of the recipient and whether and how the system will be required to generate a read receipt for the transmission.)

AIA Document A132 – 2019. Copyright © 1975, 1980, 1992, 2009, and 2019. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 18:27:25 ET on 07/02/2024 under Order No.4104248073 which expires on 01/07/2025, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (1431334764)

§ 8.7 Relationship of the Parties

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

§ 8.8 Other provisions:

ARTICLE 9 ENUMERATION OF CONTRACT DOCUMENTS

§ 9.1 This Agreement is comprised of the following documents:

.1 AIA Document A132™–2019, Standard Form of Agreement Between Owner and Contractor, Construction Manager as Adviser Edition

.2 AIA Document A132™–2019, Exhibit A, Insurance and Bonds Exhibit

.3 AIA Document A232™–2019, General Conditions of the Contract for Construction, Construction Manager as Adviser Edition

.4 Building Information Modeling Exhibit, if completed:

.5 Drawings

Number	Title	Date
TBD		

.6 Specifications

Section	Title	Date	Pages
TBD			

.7 Addenda, if any:

Number	Date	Pages
TBD		

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

.8 Other Exhibits:
(Check all boxes that apply and include appropriate information identifying the exhibit where required.)

[X] AIA Document A132™–2019, Exhibit B, Determination of the Cost of the Work

[ ] AIA Document E235™–2019, Sustainable Projects Exhibit, Construction Manager as Adviser Edition, dated as indicated below:
(Insert the date of the E235-2019 incorporated into this Agreement.)

[ ] The Sustainability Plan:

Init.
/
AIA Document A132 – 2019. Copyright © 1975, 1980, 1992, 2009, and 2019. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 18:27:25 ET on 07/02/2024 under Order No.4104248073 which expires on 01/07/2025, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (1431334764)

Title	Date	Pages

[ ] Supplementary and other Conditions of the Contract:

Document	Title	Date	Pages

.9 Other documents, if any, listed below:
(List here any additional documents that are intended to form part of the Contract Documents. AIA Document A232–2019 provides that the advertisement or invitation to bid, Instructions to Bidders, sample forms, the Contractor's bid or proposal, portions of Addenda relating to bidding or proposal requirements, and other information furnished by the Owner in anticipation of receiving bids or proposals, are not part of the Contract Documents unless enumerated in this Agreement. Any such documents should be listed here only if intended to be part of the Contract Documents.)

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

OWNER *(Signature)*	**CONTRACTOR** *(Signature)*
(Printed name and title)	*(Printed name and title)*

AIA Document A132 – 2019. Copyright © 1975, 1980, 1992, 2009, and 2019. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 18:27:25 ET on 07/02/2024 under Order No.4104248073 which expires on 01/07/2025, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (1431334764)

Additions and Deletions Report for
AIA® Document A132® – 2019

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

Note: This Additions and Deletions Report is provided for information purposes only and is not incorporated into or constitute any part of the associated AIA document. This Additions and Deletions Report and its associated document were generated simultaneously by AIA software at 18:27:25 ET on 07/02/2024.

PAGE 1

AGREEMENT made as of the Twenty-fourth day of June in the year Two-Thousand Twenty-Four

...

Murray City School District
5002 S Commerce Dr
Murray, UT 84107

...

BDK A Joint Venture
404 West 400 South
Salt Lake City, UT 84101

PAGE 2

[X] A date set forth in a notice to proceed issued by the Owner.

PAGE 3

Actual date of Substantial Completion to be determined at time of acceptance of GMP. Projected date is June 1, 2027.

...

[X] Cost of the Work plus the Contractor's Fee with a Guaranteed Maximum Price, in accordance with Section 4.4 below

PAGE 4

A. The GMP and bid packages shall be determined as _% of the Cost of the Work to be finalized into a lump sum at time of GMP, and individual bid packages. This fee amount will be calculated using the fee percentage of the Cost of the Work solely and not including the GMP fee itself or the costs of required insurances and bonds.
B. The Contractor's preconstruction fee shall be $_ as a lump sum.

PAGE 5

Contractor Fee shall adjust for work added at _% of the Cost of the Work for items added to the overall Contract. Items adjusted for the scope of the work utilizing the contract contractor's and owner's contingency established at the time of GMP hall be included as part of the Cost of work, marked up at time of GMP and therefor will not be adjusted for further fee.

...

Subcontractors overhead and profit shall be no greater than _% of the cost of its portion of the work.

...

Additions and Deletions Report for AIA Document A132 – 2019. Copyright © 1975, 1980, 1992, 2009, and 2019. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 18:27:25 ET on 07/02/2024 under Order No.4104248073 which expires on 01/07/2025, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (1431334764)

TBD

...

TBD

...

TBD

...

TBD

...

TBD
PAGE 6

$2,500.00 per calendar day exceeding the GMP defined Substantial Completion date. $2,500 per day for days exceeding the 30 days from Substantial to Final completion date.

...

None

...

§ 5.1.3 Provided that an Application for Payment is received by the Construction Manager not later than the twenty-fith day of a month, the Owner shall make payment of the amount certified to the Contractor not later than the tenth day of the following month. If an Application for Payment is received by the Construction Manager after the application date fixed above, payment of the amount certified shall be made by the Owner not later than thirty (30) days after the Construction Manager receives the Application for Payment.
PAGE 9

5%

...

Insurances and bonds are not subject to withholding of retainage.
PAGE 10

Remaining retainage will be held until Final completion.

...

12 % per annum

...

Chris Kartchner
400 W 400 S
Salt Lake City, UT 84101
PAGE 11

[X] Arbitration pursuant to Article 15 of AIA Document A232–2019.

Additions and Deletions Report for AIA Document A132 – 2019. Copyright © 1975, 1980, 1992, 2009, and 2019. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 18:27:25 ET on 07/02/2024 under Order No.4104248073 which expires on 01/07/2025, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (1431334764)

PAGE 12

No termination fee will be paid.

PAGE 13

TBD

...

TBD

...

TBD

...

[X] AIA Document A132™–2019, Exhibit B, Determination of the Cost of the Work

Additions and Deletions Report for AIA Document A132 – 2019. Copyright © 1975, 1980, 1992, 2009, and 2019. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 18:27:25 ET on 07/02/2024 under Order No.4104248073 which expires on 01/07/2025, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (1431334764)

Certification of Document's Authenticity

AIA® Document D401™ – 2003

I, , hereby certify, to the best of my knowledge, information and belief, that I created the attached final document simultaneously with its associated Additions and Deletions Report and this certification at 18:27:25 ET on 07/02/2024 under Order No. 4104248073 from AIA Contract Documents software and that in preparing the attached final document I made no changes to the original text of AIA® Document A132™ – 2019, Standard Form of Agreement Between Owner and Contractor, Construction Manager as Adviser Edition, other than those additions and deletions shown in the associated Additions and Deletions Report.

_____

(Signed)

_____

(Title)

_____

(Dated)

AIA Document D401 – 2003. Copyright © 1992 and 2003. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 18:27:25 ET on 07/02/2024 under Order No.4104248073 which expires on 01/07/2025, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes:
(1431334764)

AIA® Document A132® – 2019 Exhibit A

Insurance and Bonds

This Insurance and Bonds Exhibit is part of the Agreement, between the Owner and the Contractor, dated the day of in the year
(In words, indicate day, month, and year.)

for the following **PROJECT**:
(Name and location or address)

THE OWNER:
(Name, legal status, and address)

THE CONTRACTOR:
(Name, legal status, and address)

TABLE OF ARTICLES

A.1 GENERAL

A.2 OWNER'S INSURANCE

A.3 CONTRACTOR'S INSURANCE AND BONDS

A.4 SPECIAL TERMS AND CONDITIONS

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

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

This document is intended to be used in conjunction with AIA Document A232™–2019, General Conditions of the Contract for Construction. Article 11 of A232™–2019 contains additional insurance provisions

ARTICLE A.1 GENERAL

The Owner and Contractor shall purchase and maintain insurance, and provide bonds, as set forth in this Exhibit. As used in this Exhibit, the term General Conditions refers to AIA Document A232™–2019, General Conditions of the Contract for Construction.

ARTICLE A.2 OWNER'S INSURANCE

§ A.2.1 General

Prior to commencement of the Work, the Owner shall secure the insurance, and provide evidence of the coverage, required under this Article A.2 and, upon the Contractor's request, provide a copy of the property insurance policy or policies required by Section A.2.3. The copy of the policy or policies provided shall contain all applicable conditions, definitions, exclusions, and endorsements.

§ A.2.2 Liability Insurance

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

Init.
/

AIA Document A132 – 2019 Exhibit A. Copyright © 2019. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 11:19:48 ET on 07/03/2024 under Order No.4104248073 which expires on 01/07/2025, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (896871282)

§ A.2.3 Required Property Insurance

§ A.2.3.1 Unless this obligation is placed on the Contractor pursuant to Section A.3.3.2.1, the Owner shall purchase and maintain, from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located, property insurance written on a builder's risk "all-risks" completed value or equivalent policy form and sufficient to cover the total value of the entire Project on a replacement cost basis. The Owner's property insurance coverage shall be no less than the amount of the initial Contract Sum, plus the value of subsequent Modifications and labor performed and materials or equipment supplied by others. The property insurance shall be maintained until Substantial Completion and thereafter as provided in Section A.2.3.1.3, unless otherwise provided in the Contract Documents or otherwise agreed in writing by the parties to this Agreement. This insurance shall include the interests of the Owner, Contractor, Subcontractors, and Sub-subcontractors in the Project as insureds. This insurance shall include the interests of mortgagees as loss payees.

The owner shall provide property insurance on the site as provided through the State Risk Management. The deductible shall be $5,000.00 per claim. The Contractor shall be liable to pay the deductible.

§ A.2.3.1.1 Causes of Loss. The insurance required by this Section A.2.3.1 shall provide coverage for direct physical loss or damage, and shall not exclude the risks of fire, explosion, theft, vandalism, malicious mischief, collapse, earthquake, flood, or windstorm. The insurance shall also provide coverage for ensuing loss or resulting damage from error, omission, or deficiency in construction methods, design, specifications, workmanship, or materials. Sub-limits, if any, are as follows:
(Indicate below the cause of loss and any applicable sub-limit.)

Causes of Loss	Sub-Limit

§ A.2.3.1.2 Specific Required Coverages. The insurance required by this Section A.2.3.1 shall provide coverage for loss or damage to false work and other temporary structures, and to building systems from testing and startup. The insurance shall also cover debris removal, including demolition occasioned by enforcement of any applicable legal requirements, and reasonable compensation for the Architect's, Construction Manager's, and Contractor's services and expenses required as a result of such insured loss, including claim preparation expenses. Sub-limits, if any, are as follows:
(Indicate below type of coverage and any applicable sub-limit for specific required coverages.)

Coverage	Sub-Limit

§ A.2.3.1.3 Unless the parties agree otherwise, upon Substantial Completion, the Owner shall continue the insurance required by Section A.2.3.1 or, if necessary, replace the insurance policy required under Section A.2.3.1 with property insurance written for the total value of the Project that shall remain in effect until expiration of the period for correction of the Work set forth in Section 12.2.2 of the General Conditions.

§ A.2.3.1.4 Deductibles and Self-Insured Retentions. If the insurance required by this Section A.2.3 is subject to deductibles or self-insured retentions, the Owner shall be responsible for all loss not covered because of such deductibles or retentions.

§ A.2.3.2 Occupancy or Use Prior to Substantial Completion. The Owner's occupancy or use of any completed or partially completed portion of the Work prior to Substantial Completion shall not commence until the insurance company or companies providing the insurance under Section A.2.3.1 have consented in writing to the continuance of coverage. The Owner and the Contractor shall take no action with respect to partial occupancy or use that would cause cancellation, lapse, or reduction of insurance, unless they agree otherwise in writing.

§ A.2.3.3 Insurance for Existing Structures

If the Work involves remodeling an existing structure or constructing an addition to an existing structure, the Owner shall purchase and maintain, until the expiration of the period for correction of Work as set forth in Section 12.2.2 of the General Conditions, "all-risks" property insurance, on a replacement cost basis, protecting the existing structure against direct physical loss or damage from the causes of loss identified in Section A.2.3.1, notwithstanding the undertaking of the Work. The Owner shall be responsible for all co-insurance penalties.

Init.
/
AIA Document A132 – 2019 Exhibit A. Copyright © 2019. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 11:19:48 ET on 07/03/2024 under Order No.4104248073 which expires on 01/07/2025, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (896871282)

§ A.2.4 Optional Extended Property Insurance.
The Owner shall purchase and maintain the insurance selected and described below.
(Select the types of insurance the Owner is required to purchase and maintain by placing an X in the box(es) next to the description(s) of selected insurance. For each type of insurance selected, indicate applicable limits of coverage or other conditions in the fill point below the selected item.)

[ ] **§ A.2.4.1 Loss of Use, Business Interruption, and Delay in Completion Insurance,** to reimburse the Owner for loss of use of the Owner's property, or the inability to conduct normal operations due to a covered cause of loss.

[ ] **§ A.2.4.2 Ordinance or Law Insurance,** for the reasonable and necessary costs to satisfy the minimum requirements of the enforcement of any law or ordinance regulating the demolition, construction, repair, replacement or use of the Project.

[ ] **§ A.2.4.3 Expediting Cost Insurance,** for the reasonable and necessary costs for the temporary repair of damage to insured property, and to expedite the permanent repair or replacement of the damaged property.

[ ] **§ A.2.4.4 Extra Expense Insurance,** to provide reimbursement of the reasonable and necessary excess costs incurred during the period of restoration or repair of the damaged property that are over and above the total costs that would normally have been incurred during the same period of time had no loss or damage occurred.

[ ] **§ A.2.4.5 Civil Authority Insurance,** for losses or costs arising from an order of a civil authority prohibiting access to the Project, provided such order is the direct result of physical damage covered under the required property insurance.

[ ] **§ A.2.4.6 Ingress/Egress Insurance,** for loss due to the necessary interruption of the insured's business due to physical prevention of ingress to, or egress from, the Project as a direct result of physical damage.

[ ] **§ A.2.4.7 Soft Costs Insurance,** to reimburse the Owner for costs due to the delay of completion of the Work, arising out of physical loss or damage covered by the required property insurance: including construction loan fees; leasing and marketing expenses; additional fees, including those of architects, engineers, consultants, attorneys and accountants, needed for the completion of the construction, repairs, or reconstruction; and carrying costs such as property taxes, building permits, additional interest on loans, realty taxes, and insurance premiums over and above normal expenses.

§ A.2.5 Other Optional Insurance.
The Owner shall purchase and maintain the insurance selected below.
(Select the types of insurance the Owner is required to purchase and maintain by placing an X in the box(es) next to the description(s) of selected insurance.)

Init.
/
AIA Document A132 – 2019 Exhibit A. Copyright © 2019. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 11:19:48 ET on 07/03/2024 under Order No.4104248073 which expires on 01/07/2025, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (896871282)

[ ] § A.2.5.1 Cyber Security Insurance for loss to the Owner due to data security and privacy breach, including costs of investigating a potential or actual breach of confidential or private information. *(Indicate applicable limits of coverage or other conditions in the fill point below.)*

[ ] § A.2.5.2 Other Insurance
(List below any other insurance coverage to be provided by the Owner and any applicable limits.)

Coverage	Limits

ARTICLE A.3 CONTRACTOR'S INSURANCE AND BONDS

§ A.3.1 General

§ A.3.1.1 Certificates of Insurance. The Contractor shall provide certificates of insurance acceptable to the Owner evidencing compliance with the requirements in this Article A.3 at the following times: (1) prior to commencement of the Work; (2) upon renewal or replacement of each required policy of insurance; and (3) upon the Owner's written request. An additional certificate evidencing continuation of commercial liability coverage, including coverage for completed operations, shall be submitted with the final Application for Payment and thereafter upon renewal or replacement of such coverage until the expiration of the periods required by Section A.3.2.1 and Section A.3.3.1. The certificates will show the Owner as an additional insured on the Contractor's Commercial General Liability and excess or umbrella liability policy or policies.

§ A.3.1.2 Deductibles and Self-Insured Retentions. The Contractor shall disclose to the Owner any deductible or self-insured retentions applicable to any insurance required to be provided by the Contractor.

§ A.3.1.3 Additional Insured Obligations. To the fullest extent permitted by law, the Contractor shall cause the commercial general liability coverage to include (1) the Owner, the Architect and the Architect's consultants, and the Construction Manager and the Construction Manager's consultants, as additional insureds for claims caused in whole or in part by the Contractor's negligent acts or omissions during the Contractor's operations; and (2) the Owner as an additional insured for claims caused in whole or in part by the Contractor's negligent acts or omissions for which loss occurs during completed operations. The additional insured coverage shall be primary and non-contributory to any of the Owner's general liability insurance policies and shall apply to both ongoing and completed operations. To the extent commercially available, the additional insured coverage shall be no less than that provided by Insurance Services Office, Inc. (ISO) forms CG 20 10 07 04, CG 20 37 07 04, and, with respect to the Architect and the Architect's consultants, and the Construction Manager and the Construction Manager's consultants, CG 20 32 07 04.

§ A.3.2 Contractor's Required Insurance Coverage

§ A.3.2.1 The Contractor shall purchase and maintain the following types and limits of insurance from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located. The Contractor shall maintain the required insurance until the expiration of the period for correction of Work as set forth in Section 12.2.2 of the General Conditions, unless a different duration is stated below:
(If the Contractor is required to maintain insurance for a duration other than the expiration of the period for correction of Work, state the duration.)

§ A.3.2.2 Commercial General Liability

§ A.3.2.2.1 Commercial General Liability insurance for the Project written on an occurrence form with policy limits of not less than One Million Dollars and Zero Cents ($ 1,000,000.00) each occurrence, Two Million Dollars and Zero Cents ($ 2,000,000.00) general aggregate, and Two Million Dollars and Zero Cents ($ 2,000,000.00) aggregate for products-completed operations hazard, providing coverage for claims including

.1 damages because of bodily injury, sickness or disease, including occupational sickness or disease, and death of any person;

.2 personal injury and advertising injury;

AIA Document A132 – 2019 Exhibit A. Copyright © 2019. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 11:19:48 ET on 07/03/2024 under Order No.4104248073 which expires on 01/07/2025, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (896871282)

.3 damages because of physical damage to or destruction of tangible property, including the loss of use of such property;
.4 bodily injury or property damage arising out of completed operations; and
.5 the Contractor's indemnity obligations under Section 3.18 of the General Conditions.

§ A.3.2.2.2 The Contractor's Commercial General Liability policy under this Section A.3.2.2 shall not contain an exclusion or restriction of coverage for the following:

.1 Claims by one insured against another insured, if the exclusion or restriction is based solely on the fact that the claimant is an insured, and there would otherwise be coverage for the claim.
.2 Claims for property damage to the Contractor's Work arising out of the products-completed operations hazard where the damaged Work or the Work out of which the damage arises was performed by a Subcontractor.
.3 Claims for bodily injury other than to employees of the insured.
.4 Claims for indemnity under Section 3.18 of the General Conditions arising out of injury to employees of the insured.
.5 Claims or loss excluded under a prior work endorsement or other similar exclusionary language.
.6 Claims or loss due to physical damage under a prior injury endorsement or similar exclusionary language.
.7 Claims related to residential, multi-family, or other habitational projects, if the Work is to be performed on such a project.
.8 Claims related to roofing, if the Work involves roofing.
.9 Claims related to exterior insulation finish systems (EIFS), synthetic stucco or similar exterior coatings or surfaces, if the Work involves such coatings or surfaces.
.10 Claims related to earth subsidence or movement, where the Work involves such hazards.
.11 Claims related to explosion, collapse and underground hazards, where the Work involves such hazards.

§ A.3.2.3 Automobile Liability covering vehicles owned, and non-owned vehicles used, by the Contractor, with policy limits of not less than One Million Dollars and Zero Cents ($ 1,000,000.00) per accident, for bodily injury, death of any person, and property damage arising out of the ownership, maintenance and use of those motor vehicles along with any other statutorily required automobile coverage.

§ A.3.2.4 The Contractor may achieve the required limits and coverage for Commercial General Liability and Automobile Liability through a combination of primary and excess or umbrella liability insurance, provided such primary and excess or umbrella insurance policies result in the same or greater coverage as the coverages required under Section A.3.2.2 and A.3.2.3, and in no event shall any excess or umbrella liability insurance provide narrower coverage than the primary policy. The excess policy shall not require the exhaustion of the underlying limits only through the actual payment by the underlying insurers.

§ A.3.2.5 Workers' Compensation at statutory limits.

§ A.3.2.6 Employers' Liability with policy limits not less than One Million Dollars and Zero Cents ($ 1,000,000.00) each accident, One Million Dollars and Zero Cents ($ 1,000,000.00) each employee, and One Million Dollars and Zero Cents ($ 1,000,000.00) policy limit.

§ A.3.2.7 Jones Act, and the Longshore & Harbor Workers' Compensation Act, as required, if the Work involves hazards arising from work on or near navigable waterways, including vessels and docks

§ A.3.2.8 If the Contractor is required to furnish professional services as part of the Work, the Contractor shall procure Professional Liability insurance covering performance of the professional services, with policy limits of not less than ($) per claim and ($) in the aggregate.

§ A.3.2.9 If the Work involves the transport, dissemination, use, or release of pollutants, the Contractor shall procure Pollution Liability insurance, with policy limits of not less than ($) per claim and ($) in the aggregate.

§ A.3.2.10 Coverage under Sections A.3.2.8 and A.3.2.9 may be procured through a Combined Professional Liability and Pollution Liability insurance policy, with combined policy limits of not less than ($) per claim and ($) in the aggregate.

Init.
/
AIA Document A132 – 2019 Exhibit A. Copyright © 2019. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 11:19:48 ET on 07/03/2024 under Order No.4104248073 which expires on 01/07/2025, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (896871282)

§ A.3.2.11 Insurance for maritime liability risks associated with the operation of a vessel, if the Work requires such activities, with policy limits of not less than ($) per claim and ($) in the aggregate.

§ A.3.2.12 Insurance for the use or operation of manned or unmanned aircraft, if the Work requires such activities, with policy limits of not less than ($) per claim and ($) in the aggregate.

§ A.3.3 Contractor's Other Insurance Coverage

§ A.3.3.1 Insurance selected and described in this Section A.3.3 shall be purchased from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located. The Contractor shall maintain the required insurance until the expiration of the period for correction of Work as set forth in Section 12.2.2 of the General Conditions, unless a different duration is stated below:
(If the Contractor is required to maintain any of the types of insurance selected below for a duration other than the expiration of the period for correction of Work, state the duration.)

§ A.3.3.2 The Contractor shall purchase and maintain the following types and limits of insurance in accordance with Section A.3.3.1.
(Select the types of insurance the Contractor is required to purchase and maintain by placing an X in the box(es) next to the description(s) of selected insurance. Where policy limits are provided, include the policy limit in the appropriate fill point.)

[ ] **§ A.3.3.2.1** If there is only one Contractor performing the Work on the Project, property insurance of the same type and scope satisfying the requirements identified in Section A.2.3, which, if selected in this section A.3.3.2.1, relieves the Owner of the responsibility to purchase and maintain such insurance except insurance required by Section A.2.3.1.3 and Section A.2.3.3. The Contractor shall comply with all obligations of the Owner under Section A.2.3 except to the extent provided below. The Contractor shall disclose to the Owner the amount of any deductible, and the Owner shall be responsible for losses within the deductible. Upon request, the Contractor shall provide the Owner with a copy of the property insurance policy or policies required. The Owner shall adjust and settle the loss with the insurer and be the trustee of the proceeds of the property insurance in accordance with Article 11 of the General Conditions unless otherwise set forth below:
(Where the Contractor's obligation to provide property insurance differs from the Owner's obligations as described under Section A.2.3, indicate such differences in the space below. Additionally, if a party other than the Owner will be responsible for adjusting and settling a loss with the insurer and acting as the trustee of the proceeds of property insurance in accordance with Article 11 of the General Conditions, indicate the responsible party below.)

[ ] **§ A.3.3.2.2 Railroad Protective Liability Insurance**, with policy limits of not less than ($) per claim and ($) in the aggregate, for Work within fifty (50) feet of railroad property.

[ ] **§ A.3.3.2.3 Asbestos Abatement Liability Insurance**, with policy limits of not less than ($) per claim and ($) in the aggregate, for liability arising from the encapsulation, removal, handling, storage, transportation, and disposal of asbestos-containing materials.

[ ] **§ A.3.3.2.4** Insurance for physical damage to property while it is in storage and in transit to the construction site on an "all-risks" completed value form.

[ ] **§ A.3.3.2.5** Property insurance on an "all-risks" completed value form, covering property owned by the Contractor and used on the Project, including scaffolding and other equipment.

[ ] **§ A.3.3.2.6 Other Insurance**
(List below any other insurance coverage to be provided by the Contractor and any applicable limits.)

AIA Document A132 – 2019 Exhibit A. Copyright © 2019. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 11:19:48 ET on 07/03/2024 under Order No.4104248073 which expires on 01/07/2025, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (896871282)

Coverage	Limits

§ A.3.4 Performance Bond and Payment Bond

The Contractor shall provide surety bonds, from a company or companies lawfully authorized to issue surety bonds in the jurisdiction where the Project is located, as follows:
(Specify type and penal sum of bonds.)

Type	Penal Sum ($0.00)
Payment Bond	Equal to 100% of the Contract Sum
Performance Bond	Equal to 100% of the Contract Sum

Payment and Performance Bonds shall be AIA Document A312™, Payment Bond and Performance Bond, or contain provisions identical to AIA Document A312™, current as of the date of this Agreement.

ARTICLE A.4 SPECIAL TERMS AND CONDITIONS

Special terms and conditions that modify this Insurance and Bonds Exhibit, if any, are as follows:

AIA Document A132 – 2019 Exhibit A. Copyright © 2019. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 11:19:48 ET on 07/03/2024 under Order No.4104248073 which expires on 01/07/2025, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (896871282)

Additions and Deletions Report for

AIA® Document A132® – 2019 Exhibit A

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

Note: This Additions and Deletions Report is provided for information purposes only and is not incorporated into or constitute any part of the associated AIA document. This Additions and Deletions Report and its associated document were generated simultaneously by AIA software at 11:19:48 ET on 07/03/2024.

PAGE 2

The owner shall provide property insurance on the site as provided through the State Risk Management. The deductible shall be $5,000.00 per claim. The Contractor shall be liable to pay the deductible.

PAGE 4

§ A.3.2.2.1 Commercial General Liability insurance for the Project written on an occurrence form with policy limits of not less than One Million Dollars and Zero Cents ($ 1,000,000.00) each occurrence, Two Million Dollars and Zero Cents ($ 2,000,000.00) general aggregate, and Two Million Dollars and Zero Cents ($ 2,000,000.00) aggregate for products-completed operations hazard, providing coverage for claims including

PAGE 5

§ A.3.2.3 Automobile Liability covering vehicles owned, and non-owned vehicles used, by the Contractor, with policy limits of not less than One Million Dollars and Zero Cents ($ 1,000,000.00) per accident, for bodily injury, death of any person, and property damage arising out of the ownership, maintenance and use of those motor vehicles along with any other statutorily required automobile coverage.

...

§ A.3.2.6 Employers' Liability with policy limits not less than One Million Dollars and Zero Cents ($ 1,000,000.00) each accident, One Million Dollars and Zero Cents ($ 1,000,000.00) each employee, and One Million Dollars and Zero Cents ($ 1,000,000.00) policy limit.

PAGE 7

Payment Bond	Equal to 100% of the Contract Sum
Performance Bond	Equal to 100% of the Contract Sum

Additions and Deletions Report for AIA Document A132 – 2019 Exhibit A. Copyright © 2019. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 11:19:48 ET on 07/03/2024 under Order No.4104248073 which expires on 01/07/2025, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (896871282)

AIA® Document A132® – 2019 Exhibit B

Determination of the Cost of the Work

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

THE OWNER:
(Name, legal status, address, and other information)

THE CONTRACTOR:
(Name, legal status, address, and other information)

THE CONSTRUCTION MANAGER:
(Name, legal status, address, and other information)

THE ARCHITECT:
(Name, legal status, address, and other information)

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

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

This document is intended to be used in conjunction with AIA Documents A232™–2019, General Conditions of the Contract for Construction, Construction Manager as Adviser Edition; B132™–2019, Standard Form of Agreement Between Owner and Architect, Construction Manager as Adviser Edition; and C132™–2019, Standard Form of Agreement Between Owner and Construction Manager as Adviser. AIA Document A232™–2019 is adopted in this document by reference. Do not use with other general conditions unless this document is modified.

ARTICLE B.1 CONTROL ESTIMATE

§ B.1.1 Where the Contract Sum is based on the Cost of the Work, plus the Contractor's Fee without a Guaranteed Maximum Price pursuant to Section 4.1 of the Agreement, the Contractor shall prepare and submit to the Construction Manager, within 14 days of executing this Agreement, a written Control Estimate, for the Owner's review and acceptance. The Control Estimate shall include the estimated Cost of the Work plus the Contractor's Fee. The Control Estimate shall be used to monitor actual costs and the timely performance of the Work. The Contractor shall update the Control Estimate with each Application for Payment as needed to reflect Changes in the Work.

§ B.1.2 The Control Estimate shall include

Init.
/

AIA Document A132 – 2019 Exhibit B (formerly A132™ – 2009 Exhibit A). Copyright © 1975, 1980, 1992, 2009, and 2019. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 11:19:54 ET on 07/03/2024 under Order No.4104248073 which expires on 01/07/2025, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (1634882415)

.1 the documents enumerated in Article 1 of the Agreement, including all Modifications thereto;
.2 a list of the assumptions made by the Contractor in the preparation of the Control Estimate, including assumptions under B.1.4, to supplement the information provided by the Owner and contained in the Contract Documents;
.3 a statement of the estimated Cost of the Work organized by trade categories or systems and the Contractor's Fee;
.4 schedules, upon which the Control Estimate is based, indicating proposed Subcontractors, activity sequences and durations, milestone dates for receipt and approval of pertinent information, schedule of shop drawings and samples, procurement and delivery of materials or equipment, and the Owner's occupancy requirements; and
.5 contingencies for further development of design and construction as required by Section B.1.4.

§ B.1.3 The Contractor shall meet with the Owner and Construction Manager to review the Control Estimate. In the event that the Owner or Construction Manager discovers any inconsistencies or inaccuracies in the information presented, they shall promptly notify the Contractor, who shall make appropriate adjustments to the Control Estimate. When the Control Estimate is acceptable to the Owner, the Owner shall acknowledge it in writing. The Owner's acceptance of the Control Estimate does not imply that the Control Estimate constitutes a Guaranteed Maximum Price.

§ B.1.4 To the extent that the Contract Documents are anticipated to require further development, the Contractor shall provide in the Control Estimate for such further development consistent with the Contract Documents and reasonably inferable therefrom. Such further development does not include changes in scope, systems, kinds and quality of materials, finishes or equipment, all of which, if required, shall be incorporated in a revised Control Estimate by mutual agreement of the parties.

§ B.1.5 The Contractor shall develop and implement a detailed system of cost control that will provide the Owner and Construction Manager with timely information as to the anticipated total Cost of the Work. The cost control system shall compare the Control Estimate with the actual cost for activities in progress and estimates for uncompleted tasks and proposed changes. This information shall be reported to the Owner in writing, through the Construction Manager, no later than the Contractor's first Application for Payment and shall be revised and submitted with each Application for Payment.

§ B.1.6 The Owner shall authorize preparation of revisions to the Contract Documents that incorporate the agreed-upon assumptions contained in the Control Estimate. The Owner shall promptly furnish such revised Contract Documents to the Contractor. The Contractor shall notify the Owner, Architect, and Construction Manager of any inconsistencies between the Control Estimate and the revised Contract Documents.

ARTICLE B.2 COSTS TO BE REIMBURSED

§ B.2.1 Cost of the Work

§ B.2.1.1 The term Cost of the Work shall mean costs necessarily incurred by the Contractor in the proper performance of the Work. The Cost of the Work shall include only the items set forth in this Article B.2.

§ B.2.1.2 Where, pursuant to the Contract Documents, any cost is subject to the Owner's prior approval, the Contractor shall obtain such approval in writing prior to incurring the cost.

§ B.2.1.3 Costs shall be at rates not higher than the standard paid at the place of the Project, except with prior approval of the Owner.

§ B.2.2 Labor Costs

§ B.2.2.1 Wages or salaries of construction workers directly employed by the Contractor to perform the construction of the Work at the site or, with the Owner's prior approval, at off-site workshops.

§ B.2.2.2 Wages or salaries of the Contractor's supervisory and administrative personnel when stationed at the site and performing Work, with the Owner's prior approval.

§ B.2.2.2.1 Wages or salaries of the Contractor's supervisory and administrative personnel when performing Work and stationed at a location other than the site, but only for that portion of time required for the Work, and limited to the personnel and activities listed below:

Init.
/
AIA Document A132 – 2019 Exhibit B (formerly A132™ – 2009 Exhibit A). Copyright © 1975, 1980, 1992, 2009, and 2019. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 11:19:54 ET on 07/03/2024 under Order No.4104248073 which expires on 01/07/2025, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (1634882415)

(Identify the personnel, type of activity and, if applicable, any agreed upon percentage of time to be devoted to the Work.)

Preconstruction services not to exceed the amount agreed upon in contract from scope of preconstruction work.

§ B.2.2.3 Wages or salaries of the Contractor's supervisory or administrative personnel engaged at factories or workshops, or while traveling, in expediting the production or transportation of materials or equipment required for the Work, but only for that portion of their time required for the Work.

§ B.2.2.4 Costs paid or incurred by the Contractor, as required by law or collective bargaining agreements, for taxes, insurance, contributions, assessments, and benefits and, for personnel not covered by collective bargaining agreements, customary benefits such as sick leave, medical and health benefits, holidays, vacations and pensions, provided such costs are based on wages and salaries included in the Cost of the Work under Sections B.2.2.1 through B.2.2.3.

§ B.2.2.5 If agreed rates for labor costs, in lieu of actual costs, are provided in this Agreement, the rates shall remain unchanged throughout the duration of this Agreement, unless the parties execute a Modification.

§ B.2.3 Subcontract Costs

Payments made by the Contractor to Subcontractors in accordance with the requirements of the subcontracts and this Agreement.

§ B.2.4 Costs of Materials and Equipment Incorporated in the Completed Construction

§ B.2.4.1 Costs, including transportation and storage at the site, of materials and equipment incorporated, or to be incorporated, in the completed construction.

§ B.2.4.2 Costs of materials described in the preceding Section B.2.4.1 in excess of those actually installed to allow for reasonable waste and spoilage. Unused excess materials, if any, shall become the Owner's property at the completion of the Work or, at the Owner's option, shall be sold by the Contractor. Any amounts realized from such sales shall be credited to the Owner as a deduction from the Cost of the Work.

§ B.2.5 Costs of Other Materials and Equipment, Temporary Facilities and Related Items

§ B.2.5.1 Costs of transportation, storage, installation, dismantling, maintenance, and removal of materials, supplies, temporary facilities, machinery, equipment, and hand tools not customarily owned by construction workers that are provided by the Contractor at the site and fully consumed in the performance of the Work. Costs of materials, supplies, temporary facilities, machinery, equipment, and tools that are not fully consumed, shall be based on the cost or value of the item at the time it is first used on the Project site less the value of the item when it is no longer used at the Project site. Costs for items not fully consumed by the Contractor shall mean fair market value.

§ B.2.5.2 Rental charges for temporary facilities, machinery, equipment, and hand tools not customarily owned by construction workers that are provided by the Contractor at the site and the costs of transportation, installation, dismantling, minor repairs, and removal of such temporary facilities, machinery, equipment, and hand tools. Rates and quantities of equipment owned by the Contractor, or a related party as defined in Section B.2.8, shall be subject to the Owner's prior approval. The total rental cost of any such equipment may not exceed the purchase price of any comparable item.

§ B.2.5.3 Costs of removal of debris from the site of the Work and its proper and legal disposal.

§ B.2.5.4 Costs of the Contractor's site office, including general office equipment and supplies.

§ B.2.5.5 Costs of materials and equipment suitably stored off the site at a mutually acceptable location, subject to the Owner's prior approval.

§ B.2.6 Miscellaneous Costs

§ B.2.6.1 Premiums for that portion of insurance and bonds required by the Contract Documents that can be directly attributed to this Contract.

AIA Document A132 – 2019 Exhibit B (formerly A132™ – 2009 Exhibit A). Copyright © 1975, 1980, 1992, 2009, and 2019. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 11:19:54 ET on 07/03/2024 under Order No.4104248073 which expires on 01/07/2025, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (1634882415)

§ B.2.6.1.1 Costs for self-insurance, for either full or partial amounts of the coverages required by the Contract Documents, with the Owner's prior approval.

§ B.2.6.1.2 Costs for insurance through a captive insurer owned or controlled by the Contractor, with the Owner's prior approval.

§ B.2.6.2 Sales, use, or similar taxes, imposed by a governmental authority, that are related to the Work and for which the Contractor is liable.

§ B.2.6.3 Fees and assessments for the building permit, and for other permits, licenses, and inspections, for which the Contractor is required by the Contract Documents to pay.

§ B.2.6.4 Fees of laboratories for tests required by the Contract Documents; except those related to defective or nonconforming Work for which reimbursement is excluded under Article 13 of AIA Document A232™–2019, or by other provisions of the Contract Documents, and which do not fall within the scope of Section B.2.7.3.

§ B.2.6.5 Royalties and license fees paid for the use of a particular design, process, or product, required by the Contract Documents.

§ B.2.6.5.1 The cost of defending suits or claims for infringement of patent rights arising from requirements of the Contract Documents, payments made in accordance with legal judgments against the Contractor resulting from such suits or claims, and payments of settlements made with the Owner's consent, unless the Contractor had reason to believe that the required design, process, or product was an infringement of a copyright or a patent, and the Contractor failed to promptly furnish such information to the Architect, as required by Article 3 of AIA Document A232™–2019. The costs of legal defenses, judgments, and settlements, shall not be included in the Cost of the Work used to calculate the Contractor's Fee or subject to the Guaranteed Maximum Price.

§ B.2.6.6 Costs for communications services, electronic equipment, and software, directly related to the Work and located at the site, with the Owner's prior approval.

§ B.2.6.7 Costs of document reproductions and delivery charges.

§ B.2.6.8 Deposits lost for causes other than the Contractor's negligence or failure to fulfill a specific responsibility in the Contract Documents.

§ B.2.6.9 Legal, mediation, and arbitration costs, including attorneys' fees, other than those arising from disputes between the Owner and Contractor, reasonably incurred by the Contractor after the execution of this Agreement in the performance of the Work and with the Owner's prior approval, which shall not be unreasonably withheld.

§ B.2.6.10 Expenses incurred in accordance with the Contractor's standard written personnel policy for relocation and temporary living allowances of the Contractor's personnel required for the Work, with the Owner's prior approval.

§ B.2.6.11 That portion of the reasonable expenses of the Contractor's supervisory or administrative personnel incurred while traveling in discharge of duties connected with the Work.

§ B.2.7 Other Costs and Emergencies

§ B.2.7.1 Other costs incurred in the performance of the Work, with the Owner's prior approval.

§ B.2.7.2 Costs incurred in taking action to prevent threatened damage, injury, or loss, in case of an emergency affecting the safety of persons and property as provided in article 10 of AIA Document A232-2019.

§ B.2.7.3 Costs of repairing or correcting damaged or nonconforming Work executed by the Contractor, Subcontractors, or suppliers, provided that such damaged or nonconforming Work was not caused by negligence of, or failure to fulfill a specific responsibility by, the Contractor, and only to the extent that the cost of repair or correction is not recovered by the Contractor from insurance, sureties, Subcontractors, suppliers, or others.

AIA Document A132 – 2019 Exhibit B (formerly A132™ – 2009 Exhibit A). Copyright © 1975, 1980, 1992, 2009, and 2019. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 11:19:54 ET on 07/03/2024 under Order No.4104248073 which expires on 01/07/2025, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (1634882415)

§ B.2.8 Related Party Transactions

§ B.2.8.1 For purposes of this Section B.2.8, the term "related party" shall mean (1) a parent, subsidiary, affiliate, or other entity having common ownership of, or sharing common management with, the Contractor; (2) any entity in which any stockholder in, or management employee of, the Contractor holds an equity interest in excess of ten percent in the aggregate; (3) any entity which has the right to control the business or affairs of the Contractor; or (4) any person, or any member of the immediate family of any person, who has the right to control the business or affairs of the Contractor.

§ B.2.8.2 If any of the costs to be reimbursed arise from a transaction between the Contractor and a related party, the Contractor shall notify the Owner and the Construction Manager of the specific nature of the contemplated transaction, including the identity of the related party and the anticipated cost to be incurred, before any such transaction is consummated or cost incurred. If the Owner, after such notification, authorizes the proposed transaction in writing, then the cost incurred shall be included as a cost to be reimbursed, and the Contractor shall procure the Work, equipment, goods, or service, from the related party, as a Subcontractor, according to the terms of Article B.5. If the Owner fails to authorize the transaction in writing, the Contractor shall procure the Work, equipment, goods, or service from some person or entity other than a related party according to the terms of Article B.5.

ARTICLE B.3 COSTS NOT TO BE REIMBURSED

§ B.3.1 The Cost of the Work shall not include the items listed below:

.1 Salaries and other compensation of the Contractor's personnel stationed at the Contractor's principal office or offices other than the site office, except as specifically provided in Section B.2.2.2;

.2 Bonuses, profit sharing, incentive compensation, and any other discretionary payments, paid to anyone hired by the Contractor or paid to any Subcontractor or vendor, unless the Owner has provided prior approval;

.3 Expenses of the Contractor's principal office and offices other than the site office;

.4 Overhead and general expenses, except as may be expressly included in Article B.2;

.5 The Contractor's capital expenses, including interest on the Contractor's capital employed for the Work;

.6 Except as provided in Section B.2.7.3 of this Agreement, costs due to the negligence of, or failure to fulfill a specific responsibility of the Contract by, the Contractor, Subcontractors, and suppliers, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable;

.7 Any cost not specifically and expressly described in Article B.2; and

.8 Where a Guaranteed Maximum Price is part of the Agreement, costs, other than costs included in Change Orders approved by the Owner, that would cause the Guaranteed Maximum Price to be exceeded.

ARTICLE B.4 DISCOUNTS, REBATES AND REFUNDS

§ B.4.1 Cash discounts obtained on payments made by the Contractor shall accrue to the Owner if (1) before making the payment, the Contractor included the amount to be paid, less such discount, in an Application for Payment and received payment from the Owner, or (2) the Owner has deposited funds with the Contractor with which to make payments; otherwise, cash discounts shall accrue to the Contractor. Trade discounts, rebates, refunds, and amounts received from sales of surplus materials, and equipment shall accrue to the Owner, and the Contractor shall make provisions so that they can be obtained.

§ B.4.2 Amounts that accrue to the Owner in accordance with Section B.4.1 shall be credited to the Owner as a deduction from the Cost of the Work.

ARTICLE B.5 SUBCONTRACTS AND OTHER AGREEMENTS

§ B.5.1 Those portions of the Work that the Contractor does not customarily perform with the Contractor's own personnel shall be performed under subcontracts or other appropriate agreements with the Contractor. The Owner may designate specific persons from whom, or entities from which, the Contractor shall obtain bids. The Contractor shall obtain bids from Subcontractors, and from suppliers of materials or equipment fabricated especially for the Work, who are qualified to perform that portion of the Work in accordance with the requirements of the Contract Documents. The Contractor shall deliver such bids to the Construction Manager, Architect, and Owner, with an indication as to which bids the Contractor intends to accept. The Owner then has the right to review the Contractor's list of proposed subcontractors and suppliers and, in consultation with the Construction Manager and Architect, object to any subcontractor or supplier. Any advice of the Construction Manager or Architect, or approval or objection by the

AIA Document A132 – 2019 Exhibit B (formerly A132™ – 2009 Exhibit A). Copyright © 1975, 1980, 1992, 2009, and 2019. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 11:19:54 ET on 07/03/2024 under Order No.4104248073 which expires on 01/07/2025, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (1634882415)

Owner, shall not relieve the Contractor of its responsibility to perform the Work in accordance with the Contract Documents. The Contractor shall not be required to contract with anyone to whom the Contractor has reasonable objection.

§ B.5.2 When a Contractor has provided a Guaranteed Maximum Price, and a specific subcontractor or supplier (1) is recommended to the Owner by the Contractor; (2) is qualified to perform that portion of the Work; and (3) has submitted a bid that conforms to the requirements of the Contract Documents without reservations or exceptions, but the Owner requires that another bid be accepted, then the Contractor may require that a Change Order be issued to adjust the Guaranteed Maximum Price by the difference between the bid of the person or entity recommended to the Owner by the Contractor and the amount of the subcontract or other agreement actually signed with the person or entity designated by the Owner.

§ B.5.3 Subcontracts or other agreements shall conform to the applicable payment provisions of this Agreement, and shall not be awarded on the basis of cost plus a fee without the Owner's prior written approval. If a subcontract is awarded on the basis of cost-plus a fee, the Contractor shall provide in the subcontract for the Owner to receive the same audit rights with regard to the Subcontractor as the Owner receives with regard to the Contractor in Article B.6, below.

§ B.5.4 Where the Contract Sum is based upon the Cost of the Work Plus a Fee without a Guaranteed Maximum Price, the Contractor shall prepare, for the Construction Manager and Architect's review and the Owner's acceptance, a procurement schedule for items that must be ordered well in advance of construction. The Contractor shall expedite and coordinate the ordering and delivery of materials that must be ordered well in advance of construction. If the Owner agrees to procure any items prior to the Owner's approval of the Control Estimate, the Owner shall procure the items on terms and conditions acceptable to the Contractor. Upon the Owner's approval of the Control Estimate, the Owner shall assign all contracts for these items to the Contractor and the Contractor shall thereafter accept responsibility for them.

ARTICLE B.6 ACCOUNTING RECORDS

§ B.6.1 The Contractor shall keep full and detailed records and accounts related to the Cost of the Work, and exercise such controls as may be necessary for proper financial management under this Contract and to substantiate all costs incurred. The accounting and control systems shall be satisfactory to the Owner and the Construction Manager. The Owner and the Owner's auditors shall, during regular business hours and upon reasonable notice, be afforded access to, and shall be permitted to audit and copy, the Contractor's records and accounts, including complete documentation supporting accounting entries, books, job cost reports, correspondence, instructions, drawings, receipts, subcontracts, Subcontractor's proposals, Subcontractor's invoices, purchase orders, vouchers, memoranda, and other data relating to this Contract. The Contractor shall preserve these records, for a period of three years after final payment, or for such longer period as may be required by law.

§ B.6.2 When the Contractor believes that all the Work required by the Agreement has been fully performed, the Contractor shall deliver to the Owner, through the Construction Manager, a final accounting of the Cost of the Work.

§ B.6.3 Within 30 days after the Owner's receipt of the Contractor's final accounting for the Cost of the Work, the Owner shall conduct an audit of the Cost of the Work or notify the Construction Manager and Architect that it will not conduct an audit.

§ B.6.3.1 If the Owner conducts an audit of the Cost of the Work, the Owner shall, within 10 days after completion of the audit, submit a written report based upon the auditor's findings to the Construction Manager and Architect.

§ B.6.3.2 Within seven days after receipt of the written report described in Section B.6.3.1, or receipt of notice that the Owner will not conduct an audit, and provided that the other conditions of Section 5.2 of the Agreement have been met, the Architect will either issue to the Owner, through the Construction Manager, a final Certificate for Payment, with a copy to the Contractor, or notify the Contractor, Construction Manager, and Owner, in writing, of the Architect's reasons for withholding a certificate as provided in Article 9 of AIA Document A232-2019. The time periods stated in this Section B.6.3.2 supersede those stated in Article 9 of AIA Document A232-2019. Neither the Architect, nor the Construction Manager, is responsible for verifying the accuracy of the Contractor's final accounting.

AIA Document A132 – 2019 Exhibit B (formerly A132™ – 2009 Exhibit A). Copyright © 1975, 1980, 1992, 2009, and 2019. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 11:19:54 ET on 07/03/2024 under Order No.4104248073 which expires on 01/07/2025, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (1634882415)

§ B.6.3.3 If the Owner's auditors' report concludes that the Cost of the Work, as substantiated by the Contractor's final accounting, is less than claimed by the Contractor, the Contractor shall be entitled to request mediation of the disputed amount without seeking an initial decision pursuant to Article 15 of AIA Document A232-2019. A request for mediation shall be made by the Contractor within 30 days after the Contractor's receipt of a copy of the final Certificate for Payment. Failure to request mediation within this 30-day period shall result in the substantiated amount reported by the Owner's auditors becoming binding on the Contractor. Pending a final resolution of the disputed amount, the Owner shall pay the Contractor the amount certified in the final Certificate for Payment.

§ B.6.4 If, subsequent to final payment, and at the Owner's request, the Contractor incurs costs, described in Article B.2, and not excluded by Article B.3, to correct defective or nonconforming Work, the Owner shall reimburse the Contractor for such costs and the Contractor's Fee applicable thereto, on the same basis as if such costs had been incurred prior to final payment, but not in excess of the Guaranteed Maximum Price, if any. If adjustments to the Contract Sum are provided for in Section 4.6 of the Agreement, the amount of those adjustments shall be recalculated, taking into account any reimbursements made pursuant to this Section B.6.4 in determining the net amount to be paid by the Owner to the Contractor.

AIA Document A132 – 2019 Exhibit B (formerly A132™ – 2009 Exhibit A). Copyright © 1975, 1980, 1992, 2009, and 2019. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 11:19:54 ET on 07/03/2024 under Order No.4104248073 which expires on 01/07/2025, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (1634882415)

Additions and Deletions Report for

AIA® Document A132® – 2019 Exhibit B

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

Note: This Additions and Deletions Report is provided for information purposes only and is not incorporated into or constitute any part of the associated AIA document. This Additions and Deletions Report and its associated document were generated simultaneously by AIA software at 11:19:54 ET on 07/03/2024.

PAGE 3

Preconstruction services not to exceed the amount agreed upon in contract from scope of preconstruction work.

Additions and Deletions Report for AIA Document A132 – 2019 Exhibit B (formerly A132™ – 2009 Exhibit A). Copyright © 1975, 1980, 1992, 2009, and 2019. All rights reserved. "The American Institute of Architects," "American Institute of Architects," "AIA," the AIA Logo, and "AIA Contract Documents" are trademarks of The American Institute of Architects. This document was produced at 11:19:54 ET on 07/03/2024 under Order No.4104248073 which expires on 01/07/2025, is not for resale, is licensed for one-time use only, and may only be used in accordance with the AIA Contract Documents® Terms of Service. To report copyright violations, e-mail docinfo@aiacontracts.com.
User Notes: (1634882415)

SUBSTITUTION REQUEST FORM (During Bidding Process)

Project Designation: _____ Request Number: _____

To: _____

From: _____

Bid Date: _____

Architect will only consider requests for proposed substitutions made 10 days prior to bid date.
Proposed substitutions may be considered after this date when a project becomes unavailable through no fault of the contractor.

A proposed product is not legally approved and cannot legally be included in a bid or used in the Work until it appears in an Addendum or other Contract Modification as defined in the General Conditions. See Instructions To Bidders.

PROPOSED EQUAL PRODUCT:

Specification Section: _____

Specified Products: _____

Proposed Product: _____

As specified in 01 6000 the undersigned certifies:

1. Has investigated proposed product and determined that it meets or exceeds the quality level of the specified product.
2. Agrees to provide the same warranty for the substitution as for the specified product.
3. Agrees to coordinate installation and make changes to other Work that may be required for the Work to be complete with no additional cost o Owner.
4. Waives claims for additional costs or time extension that may subsequently become apparent.
5. Agrees to reimburse Owner and Architect for review or redesign services associated with re-approval by authorities.

ATTACHMENTS:

Include the following attachments:

1. Copy of the Project Manual Section where the proposed equal product would be specified, rewritten or red-lined to include any changes necessary to correctly specify the proposed equal product. Identify completely changes necessary to the original Project Manual Section.
2. Copies of details, elevations, cross-sections, and other elements of the Project Drawings redone as necessary to show changes necessary to accommodate proposed equal product. Identify completely the changes from the original Drawings.
3. Complete product literature, technical data, installation and maintenance instructions, test results, and other information required to show complete conformance with requirements of the Contract Documents.

SIGNED: _____

Company _____

Address _____

City, State, Zip _____

Telephone _____ FAX _____

REVIEW COMMENTS:

_____ Accepted. See Addenda Number _____

_____Submission Not In Compliance with Instructions. Respond to attached comments and resubmit.

_____Proposed Equal Product Not Acceptable. Use specified products.

_____Not Reviewed. Submission received too late. Use specified products.

ADDITIONAL COMMENTS:

BY: _____ DATE: _____

SECTION 00 5500

NOTICE TO PROCEED

PROJECT: **RIVERVIEW JUNIOR HIGH SCHOOL REPLACEMENT - BP 03**

PROJECT ADDRESS: **751 WEST TRIPP LANE, MURRAY, UTAH 84123**

DATE: _____

NOTICE:

YOU ARE HEREBY NOTIFIED TO COMMENCE WORK IN ACCORDANCE WITH THE FORM OF AGREEMENT DATED [_____], ON OR BEFORE [_____], AND YOU ARE TO COMPLETE THE WORK ON OR BEFORE [_____].

CERTIFIED BY:

_____
Owner's Name

_____
Printed Name

_____
Title

_____
Signature

RECEIPT OF THE ABOVE NOTICE TO PROCEED IS HEREBY ACKNOWLEDGED BY:

_____
Firm Name

_____
Print Name

_____
Title

_____
Signature

_____
Date

This page intentionally left blank

SECTION 00 6536
WARRANTY FORM

PROJECT INFORMATION

Project Name: Riverview Junior High School Replacement - BP 03.
Project Address: 751 West Tripp Lane, Murray, Utah 84123
Owner: Murray City School District.
Owner's Address: 5102 S Commerce Drive Murray, Utah 84107

CONTRACTOR

Contractor Name: _____

Contractor's Address: _____

_____

GUARANTEE/WARRANTY

Date: _____

Know all persons by these present that, in consideration of my (our) having been awarded the Contract for complete furnishing and installation of: (List specific sections and extent of work.)

_____
_____
_____
_____

In conformity with the drawings and specifications prepared by Naylor Wentworth Lund Architects, 723 West Pacific Ave., Salt Lake City, Utah 84104.

We do hereby agree to return to the project with three (3) working days upon notification by the Owner that materials and/or workmanship has proven faulty and to repair, replace or otherwise make good to the full satisfaction of the Owner and/or Architect all such work (including adjacent work disturbed in completing required work under this warranty) without cost to the Owner.

This agreement shall remain in full force and effect until _____ year(s) from date of Substantial Completion established for the project by the Architect on the Certificate of Substantial Completion.

_____ Authorized Signature

_____ Title

_____ Contractor

This page intentionally left blank

AIA® Document A232™ – 2019

General Conditions of the Contract for Construction, Construction Manager as Adviser Edition

for the following PROJECT:
(Name, and location or address)

THE CONSTRUCTION MANAGER:
(Name, legal status, and address)

THE OWNER:
(Name, legal status, and address)

THE ARCHITECT:
(Name, legal status, and address)

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

This document is intended to be used in conjunction with AIA Documents A132™–2019, Standard Form of Agreement Between Owner and Contractor, Construction Manager as Adviser Edition; B132™–2019, Standard Form of Agreement Between Owner and Architect, Construction Manager as Adviser Edition; and C132™–2019, Standard Form of Agreement Between Owner and Construction Manager as Adviser.

Sample

TABLE OF ARTICLES

1 GENERAL PROVISIONS
2 OWNER
3 CONTRACTOR
4 ARCHITECT AND CONSTRUCTION MANAGER
5 SUBCONTRACTORS
6 CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS
7 CHANGES IN THE WORK
8 TIME
9 PAYMENTS AND COMPLETION
10 PROTECTION OF PERSONS AND PROPERTY
11 INSURANCE AND BONDS
12 UNCOVERING AND CORRECTION OF WORK
13 MISCELLANEOUS PROVISIONS
14 TERMINATION OR SUSPENSION OF THE CONTRACT
15 CLAIMS AND DISPUTES

AIA Document A232™ – 2019. Copyright © 1992, 2009, and 2019 by The American Institute of Architects. **All rights reserved. WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law.** To report copyright violations of AIA Contract Documents, e-mail The American Institute of Architects' legal counsel, copyright@aia.org.

Init.

/

ARTICLE 1 GENERAL PROVISIONS

§ 1.1 Basic Definitions

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

§ 1.1.2 The Contract. The Contract Documents form the Contract for Construction. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations, or agreements, either written or oral. The Contract may be amended or modified only by a Modification. The Contract Documents shall not be construed to create a contractual relationship of any kind (1) between the Contractor and the Architect or the Architect's consultants, (2) between the Owner and the Construction Manager or the Construction Manager's consultants, (3) between the Owner and the Architect or the Architect's consultants, (4) between the Contractor and the Construction Manager or the Construction Manager's consultants, (5) between the Owner and a Subcontractor or Sub-subcontractor (6) between the Construction Manager and the Architect, or (7) between any persons or entities other than the Owner and Contractor. The Construction Manager and Architect shall, however, be entitled to performance and enforcement of obligations under the Contract intended to facilitate performance of their duties.

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

§ 1.1.4 The Project. The Project is the total construction of which the Work performed under the Contract Documents may be the whole or a part and which may include construction by other Contractors, and by the Owner's own forces and Separate Contractors.

§ 1.1.5 Contractors. Contractors are persons or entities, other than the Contractor or Separate Contractors, who perform Work under contracts with the Owner that are administered by the Architect and Construction Manager.

§ 1.1.6 Separate Contractors. Separate Contractors are persons or entities who perform construction under separate contracts with the Owner not administered by the Architect and Construction Manager.

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

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

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

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

§ 1.2 Correlation and Intent of the Contract Documents

§ 1.2.1 The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work by the Contractor. The Contract Documents are complementary, and what is required by one shall be as

Sample

AIA Document A232™ – 2019. Copyright © 1992, 2009, and 2019 by The American Institute of Architects. **All rights reserved. WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law.** To report copyright violations of AIA Contract Documents, e-mail The American Institute of Architects' legal counsel, copyright@aia.org.

binding as if required by all; performance by the Contractor shall be required only to the extent consistent with the Contract Documents and reasonably inferable from them as being necessary to produce the indicated results.

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

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

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

§ 1.3 Capitalization

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

§ 1.4 Interpretation

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

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

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

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

§ 1.6 Notice

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

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

§ 1.7 Digital Data Use and Transmission

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

Sample

AIA Document A232™ – 2019. Copyright © 1992, 2009, and 2019 by The American Institute of Architects**. All rights reserved. WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law.** To report copyright violations of AIA Contract Documents, e-mail The American Institute of Architects' legal counsel, copyright@aia.org.

§ 1.8 Building Information Models Use and Reliance

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

ARTICLE 2 OWNER

§ 2.1 General

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

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

§ 2.2 Evidence of the Owner's Financial Arrangements

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

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

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

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

§ 2.3 Information and Services Required of the Owner

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

Sample

AIA Document A232™ – 2019. Copyright © 1992, 2009, and 2019 by The American Institute of Architects. **All rights reserved. WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law.** To report copyright violations of AIA Contract Documents, e-mail The American Institute of Architects' legal counsel, copyright@aia.org.

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

§ 2.3.3 The Owner shall retain a construction manager adviser lawfully practicing construction management in the jurisdiction where the Project is located. That person or entity is identified as the Construction Manager in the Agreement and is referred to throughout the Contract Documents as if singular in number.

§ 2.3.4 If the employment of the Construction Manager or Architect terminates, the Owner shall employ a successor construction manager or architect to whom the Contractor has no reasonable objection and whose status under the Contract Documents shall be that of the Construction Manager or Architect, respectively.

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

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

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

§ 2.3.8 The Owner shall forward all communications to the Contractor through the Construction Manager. Other communication shall be made as set forth in Section 4.2.6.

§ 2.4 Owner's Right to Stop the Work

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

§ 2.5 Owner's Right to Carry Out the Work

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

ARTICLE 3 CONTRACTOR

§ 3.1 General

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

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

Sample

AIA Document A232™ – 2019. Copyright © 1992, 2009, and 2019 by The American Institute of Architects. **All rights reserved. WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law.** To report copyright violations of AIA Contract Documents, e-mail The American Institute of Architects' legal counsel, copyright@aia.org.

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

§ 3.2 Review of Contract Documents and Field Conditions by Contractor

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

§ 3.2.2 Because the Contract Documents are complementary, the Contractor shall, before starting each portion of the Work, carefully study and compare the various Contract Documents relative to that portion of the Work, as well as the information furnished by the Owner pursuant to Section 2.3.5, shall take field measurements of any existing conditions related to that portion of the Work, and shall observe any conditions at the site affecting it. These obligations are for the purpose of facilitating coordination and construction by the Contractor and are not for the purpose of discovering errors, omissions, or inconsistencies in the Contract Documents; however, the Contractor shall promptly report to the Construction Manager and Architect any errors, inconsistencies or omissions discovered by or made known to the Contractor as a request for information submitted to the Construction Manager in such form as the Construction Manager and Architect may require. It is recognized that the Contractor's review is made in the Contractor's capacity as a contractor and not as a licensed design professional, unless otherwise specifically provided in the Contract Documents.

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

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

§ 3.3 Supervision and Construction Procedures

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

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

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

Sample

AIA Document A232™ – 2019. Copyright © 1992, 2009, and 2019 by The American Institute of Architects. **All rights reserved. WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law.** To report copyright violations of AIA Contract Documents, e-mail The American Institute of Architects' legal counsel, copyright@aia.org.

§ 3.4 Labor and Materials

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

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

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

§ 3.5 Warranty

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

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

§ 3.6 Taxes

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

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

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

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

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

§ 3.7.4 Concealed or Unknown Conditions. If the Contractor encounters conditions at the site that are (1) subsurface or otherwise concealed physical conditions that differ materially from those indicated in the Contract Documents or (2) unknown physical conditions of an unusual nature that differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Contract Documents, the Contractor shall promptly provide notice to the Owner, Construction Manager, and the Architect before conditions are disturbed and in no event later than 14 days after first observance of the conditions. The Architect and Construction Manager will promptly investigate such conditions and, if the Architect, in consultation with the Construction Manager, determines that they differ materially and cause an increase or decrease in the Contractor's cost of, or time required for, performance of any part of the Work, will recommend that an equitable adjustment be made in the Contract Sum or Contract Time, or both. If the Architect, in consultation with the Construction Manager, determines that the conditions at the site are not materially different from those indicated in the Contract Documents and that no change in the terms of

Sample

AIA Document A232™ – 2019. Copyright © 1992, 2009, and 2019 by The American Institute of Architects. **All rights reserved. WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law.** To report copyright violations of AIA Contract Documents, e-mail The American Institute of Architects' legal counsel, copyright@aia.org.

the Contract is justified, the Architect shall promptly notify the Owner, Construction Manager, and Contractor, stating the reasons. If the Owner or Contractor disputes the Architect's determination or recommendation, either party may submit a Claim as provided in Article 15.

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

§ 3.8 Allowances

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

§ 3.8.2 Unless otherwise provided in the Contract Documents:

.1 allowances shall cover the cost to the Contractor of materials and equipment delivered at the site and all required taxes, less applicable trade discounts;

.2 Contractor's costs for unloading and handling at the site, labor, installation costs, overhead, profit, and other expenses contemplated for stated allowance amounts shall be included in the Contract Sum but not in the allowances; and

.3 whenever costs are more than or less than allowances, the Contract Sum shall be adjusted accordingly by Change Order. The amount of the Change Order shall reflect (1) the difference between actual costs and the allowances under Section 3.8.2.1 and (2) changes in Contractor's costs under Section 3.8.2.2.

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

§ 3.9 Superintendent

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

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

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

§ 3.10 Contractor's Construction and Submittal Schedules

§ 3.10.1 The Contractor, promptly after being awarded the Contract, shall submit for the Owner's and Architect's information, and the Construction Manager's use in developing the Project schedule, a Contractor's construction schedule for the Work. The schedule shall contain detail appropriate for the Project, including (1) the date of commencement of the Work, interim schedule milestone dates, and the date of Substantial Completion; (2) an apportionment of the Work by construction activity; and (3) the time required for completion of each portion of the Work. The schedule shall provide for the orderly progression of the Work to completion and shall not exceed time limits current under the Contract Documents. The schedule shall be revised at appropriate intervals as required by the conditions of the Work and Project. The Contractor shall cooperate with the Construction Manager in scheduling and performing the Contractor's Work to avoid conflict with, and as to cause no delay in, the work or activities of other Contractors, or the construction or operations of the Owner's own forces or Separate Contractors.

Sample

AIA Document A232™ – 2019. Copyright © 1992, 2009, and 2019 by The American Institute of Architects. **All rights reserved. WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law.** To report copyright violations of AIA Contract Documents, e-mail The American Institute of Architects' legal counsel, copyright@aia.org.

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

§ 3.10.3 The Contractor shall participate with other Contractors, the Construction Manager, and the Owner in reviewing and coordinating all schedules for incorporation into the Project schedule that is prepared by the Construction Manager. The Contractor shall make revisions to the construction schedule and submittal schedule as deemed necessary by the Construction Manager to conform to the Project schedule.

§ 3.10.4 The Contractor shall perform the Work in general accordance with the most recent schedules submitted to the Owner, Construction Manager, and Architect, and incorporated into the approved Project schedule.

§ 3.11 Documents and Samples at the Site

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

§ 3.12 Shop Drawings, Product Data, and Samples

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

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

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

§ 3.12.4 Shop Drawings, Product Data, Samples, and similar submittals are not Contract Documents. Their purpose is to demonstrate how the Contractor proposes to conform to the information given and the design concept expressed in the Contract Documents for those portions of the Work for which the Contract Documents require submittals. Review by the Architect and Construction Manager is subject to the limitations of Sections 4.2.10 through 4.2.12. Informational submittals upon which the Construction Manager and Architect are not expected to take responsive action may be so identified in the Contract Documents. Submittals that are not required by the Contract Documents may be returned by the Construction Manager or Architect without action.

§ 3.12.5 The Contractor shall review for compliance with the Contract Documents, approve, and submit to the Construction Manager, Shop Drawings, Product Data, Samples, and similar submittals required by the Contract Documents, in accordance with the Project submittal schedule approved by the Construction Manager and Architect or, in the absence of an approved Project submittal schedule, with reasonable promptness and in such sequence as to cause no delay in the Work or in the activities of other Contractors, Separate Contractors, or the Owner's own forces. The Contractor shall cooperate with the Construction Manager in the coordination of the Contractor's Shop Drawings, Product Data, Samples, and similar submittals with related documents submitted by other Contractors.

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

Sample

AIA Document A232™ – 2019. Copyright © 1992, 2009, and 2019 by The American Institute of Architects. **All rights reserved. WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law.** To report copyright violations of AIA Contract Documents, e-mail The American Institute of Architects' legal counsel, copyright@aia.org.

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

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

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

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

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

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

§ 3.13 Use of Site

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

§ 3.13.2 The Contractor shall coordinate the Contractor's operations with, and secure the approval of, the Construction Manager before using any portion of the site.

§ 3.14 Cutting and Patching

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

§ 3.14.2 The Contractor shall not damage or endanger a portion of the Work or fully or partially completed construction of the Owner, Separate Contractors, or of other Contractors by cutting, patching, or otherwise altering such

Sample

AIA Document A232™ – 2019. Copyright © 1992, 2009, and 2019 by The American Institute of Architects. **All rights reserved. WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law.** To report copyright violations of AIA Contract Documents, e-mail The American Institute of Architects' legal counsel, copyright@aia.org.

construction, or by excavation. The Contractor shall not cut or otherwise alter construction by the Owner, Separate Contractors, or by other Contractors except with written consent of the Construction Manager, Owner, and such other Contractors or Separate Contractors. Consent shall not be unreasonably withheld. The Contractor shall not unreasonably withhold, from the Separate Contractors, other Contractors, or the Owner, its consent to cutting or otherwise altering the Work.

§ 3.15 Cleaning Up

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

§ 3.15.2 If the Contractor fails to clean up as provided in the Contract Documents, the Owner, or Construction Manager with the Owner's approval, may do so and the Owner shall be entitled to reimbursement from the Contractor.

§ 3.16 Access to Work

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

§ 3.17 Royalties, Patents and Copyrights

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

§ 3.18 Indemnification

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

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

ARTICLE 4 ARCHITECT AND CONSTRUCTION MANAGER

§ 4.1 General

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

§ 4.1.2 The Construction Manager is the person or entity retained by the Owner pursuant to Section 2.3.3 and identified as such in the Agreement.

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

Sample

AIA Document A232™ – 2019. Copyright © 1992, 2009, and 2019 by The American Institute of Architects. **All rights reserved. WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law.** To report copyright violations of AIA Contract Documents, e-mail The American Institute of Architects' legal counsel, copyright@aia.org.

§ 4.2 Administration of the Contract

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

§ 4.2.2 The Architect will visit the site at intervals appropriate to the stage of construction, or as otherwise agreed with the Owner, to become generally familiar with the progress and quality of the portion of the Work completed, and to determine in general if the Work observed is being performed in a manner indicating that the Work, when fully completed, will be in accordance with the Contract Documents. However, the Architect will not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the Work. On the basis of the site visits, the Architect will keep the Owner and the Construction Manager reasonably informed about the progress and quality of the portion of the Work completed, and promptly report to the Owner and Construction Manager known deviations from the Contract Documents and defects and deficiencies observed in the Work.

§ 4.2.3 The Construction Manager shall provide one or more representatives who shall be in attendance at the Project site whenever the Work is being performed. The Construction Manager will determine in general if the Work observed is being performed in accordance with the Contract Documents, will keep the Owner and Architect reasonably informed of the progress of the Work, and will promptly report to the Owner and Architect known deviations from the Contract Documents and the most recent Project schedule, and defects and deficiencies observed in the Work.

§ 4.2.4 The Construction Manager will schedule and coordinate the activities of the Contractor and other Contractors in accordance with the latest approved Project schedule.

§ 4.2.5 The Construction Manager, except to the extent required by Section 4.2.4, and Architect will not have control over, charge of, or responsibility for, the construction means, methods, techniques, sequences or procedures, or for the safety precautions and programs in connection with the Work, since these are solely the Contractor's rights and responsibilities under the Contract Documents, and neither will be responsible for the Contractor's failure to perform the Work in accordance with the requirements of the Contract Documents. Neither the Construction Manager nor the Architect will have control over or charge of, or be responsible for acts or omissions of, the Contractor, Subcontractors, or their agents or employees, or of any other persons or entities performing portions of the Work.

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

§ 4.2.7 The Construction Manager and Architect will review and certify all Applications for Payment by the Contractor, in accordance with the provisions of Article 9.

§ 4.2.8 The Architect and Construction Manager have authority to reject Work that does not conform to the Contract Documents, and will notify each other about the rejection. Whenever the Construction Manager considers it necessary or advisable, the Construction Manager will have authority to require inspection or testing of the Work in accordance with Sections 13.4.2 and 13.4.3, upon written authorization of the Owner, whether or not the Work is fabricated, installed or completed. The foregoing authority of the Construction Manager will be subject to the provisions of Sections 4.2.18 through 4.2.20 inclusive, with respect to interpretations and decisions of the Architect. However, neither the Architect's nor the Construction Manager's authority to act under this Section 4.2.8 nor a decision made by either of them in good faith either to exercise or not to exercise such authority shall give rise to a duty or responsibility of the Architect or the Construction Manager to the Contractor, Subcontractors, suppliers, their agents or employees, or other persons performing any of the Work.

§ 4.2.9 Utilizing the submittal schedule provided by the Contractor, the Construction Manager shall prepare, and revise as necessary, a Project submittal schedule incorporating information from other Contractors, the Owner, Owner's

Sample

AIA Document A232™ – 2019. Copyright © 1992, 2009, and 2019 by The American Institute of Architects. **All rights reserved. WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law.** To report copyright violations of AIA Contract Documents, e-mail The American Institute of Architects' legal counsel, copyright@aia.org.

consultants, Owner's Separate Contractors and vendors, governmental agencies, and participants in the Project under the management of the Construction Manager. The Project submittal schedule and any revisions shall be submitted to the Architect for approval.

§ 4.2.10 The Construction Manager will receive and promptly review for conformance with the submittal requirements of the Contract Documents, all submittals from the Contractor such as Shop Drawings, Product Data, and Samples. Where there are other Contractors, the Construction Manager will also check and coordinate the information contained within each submittal received from the Contractor and other Contractors, and transmit to the Architect those recommended for approval. By submitting Shop Drawings, Product Data, Samples, and similar submittals, the Construction Manager represents to the Owner and Architect that the Construction Manager has reviewed and recommended them for approval. The Construction Manager's actions will be taken in accordance with the Project submittal schedule approved by the Architect or, in the absence of an approved Project submittal schedule, with reasonable promptness while allowing sufficient time to permit adequate review by the Architect.

§ 4.2.11 The Architect will review and approve, or take other appropriate action upon, the Contractor's submittals such as Shop Drawings, Product Data, and Samples, but only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Architect's action will be taken in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness while allowing sufficient time in the Architect's professional judgment to permit adequate review. Upon the Architect's completed review, the Architect shall transmit its submittal review to the Construction Manager.

§ 4.2.12 Review of the Contractor's submittals by the Construction Manager and Architect is not conducted for the purpose of determining the accuracy and completeness of other details such as dimensions and quantities, or for substantiating instructions for installation or performance of equipment or systems, all of which remain the responsibility of the Contractor as required by the Contract Documents. The Construction Manager and Architect's review of the Contractor's submittals shall not relieve the Contractor of the obligations under Sections 3.3, 3.5, and 3.12. The Construction Manager and Architect's review shall not constitute approval of safety precautions or of any construction means, methods, techniques, sequences, or procedures. The Architect's approval of a specific item shall not indicate approval of an assembly of which the item is a component.

§ 4.2.13 The Construction Manager will prepare Change Orders and Construction Change Directives.

§ 4.2.14 The Construction Manager and the Architect will take appropriate action on Change Orders or Construction Change Directives in accordance with Article 7, and the Architect will have authority to order minor changes in the Work as provided in Section 7.4. The Architect, in consultation with the Construction Manager, will investigate and make determinations and recommendations regarding concealed and unknown conditions as provided in Section 3.7.4.

§ 4.2.15 Utilizing the documents provided by the Contractor, the Construction Manager will maintain at the site for the Owner one copy of all Contract Documents, approved Shop Drawings, Product Data, Samples, and similar required submittals, in good order and marked currently to record all changes and selections made during construction. These will be available to the Architect and the Contractor, and will be delivered to the Owner upon completion of the Project.

§ 4.2.16 The Construction Manager will assist the Architect in conducting inspections to determine the date or dates of Substantial Completion and the date of final completion; issue Certificates of Substantial Completion in conjunction with the Architect pursuant to Section 9.8; and receive and forward to the Owner written warranties and related documents required by the Contract and assembled by the Contractor pursuant to Section 9.10. The Construction Manager will forward to the Architect a final Application and Certificate for Payment or final Project Application and Project Certificate for Payment upon the Contractor's compliance with the requirements of the Contract Documents.

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

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

Sample

AIA Document A232™ – 2019. Copyright © 1992, 2009, and 2019 by The American Institute of Architects. **All rights reserved. WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law.** To report copyright violations of AIA Contract Documents, e-mail The American Institute of Architects' legal counsel, copyright@aia.org.

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

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

§ 4.2.21 The Construction Manager will receive and review requests for information from the Contractor, and forward each request for information to the Architect, with the Construction Manager's recommendation. The Architect will review and respond in writing, through the Construction Manager, to requests for information about the Contract Documents. The Construction Manager's recommendation and the Architect's response to each request will be made in writing within any time limits agreed upon or otherwise with reasonable promptness. If appropriate, the Architect will prepare and issue supplemental Drawings and Specifications in response to the requests for information.

ARTICLE 5 SUBCONTRACTORS

§ 5.1 Definitions

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

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

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

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

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

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

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

§ 5.3 Subcontractual Relations

By appropriate written agreement, the Contractor shall require each Subcontractor, to the extent of the Work to be performed by the Subcontractor, to be bound to the Contractor by terms of the Contract Documents, and to assume toward the Contractor all the obligations and responsibilities, including the responsibility for safety of the Subcontractor's Work, that the Contractor, by these Contract Documents, assumes toward the Owner, Construction Manager and Architect. Each subcontract agreement shall preserve and protect the rights of the Owner, Construction Manager and Architect under the Contract Documents with respect to the Work to be performed by the Subcontractor so that subcontracting thereof will not prejudice such rights, and shall allow to the Subcontractor, unless specifically

Sample

AIA Document A232™ – 2019. Copyright © 1992, 2009, and 2019 by The American Institute of Architects. **All rights reserved. WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law.** To report copyright violations of AIA Contract Documents, e-mail The American Institute of Architects' legal counsel, copyright@aia.org.

provided otherwise in the subcontract agreement, the benefit of all rights, remedies, and redress against the Contractor that the Contractor, by the Contract Documents, has against the Owner. Where appropriate, the Contractor shall require each Subcontractor to enter into similar agreements with Sub-subcontractors. The Contractor shall make available to each proposed Subcontractor, prior to the execution of the subcontract agreement, copies of the Contract Documents to which the Subcontractor will be bound, and, upon written request of the Subcontractor, identify to the Subcontractor terms and conditions of the proposed subcontract agreement that may be at variance with the Contract Documents. Subcontractors will similarly make copies of applicable portions of such documents available to their respective proposed Sub-subcontractors.

§ 5.4 Contingent Assignment of Subcontracts

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

.1 assignment is effective only after termination of the Contract by the Owner for cause pursuant to Section 14.2 and only for those subcontract agreements that the Owner accepts by notifying the Subcontractor and Contractor; and

.2 assignment is subject to the prior rights of the surety, if any, obligated under bond relating to the Contract.

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

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

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

ARTICLE 6 CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS

§ 6.1 Owner's Right to Perform Construction with Own Forces and to Award Other Contracts

§ 6.1.1 The Owner reserves the right to perform construction or operations related to the Project with the Owner's own forces, and with Separate Contractors retained under Conditions of the Contract substantially similar to those of this Contract, including those provisions of the Conditions of the Contract related to insurance and waiver of subrogation.

§ 6.1.2 When the Owner performs construction or operations with the Owner's own forces or Separate Contractors, the Owner shall provide for coordination of such forces and Separate Contractors with the Work of the Contractor, who shall cooperate with them.

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

§ 6.2 Mutual Responsibility

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

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

Sample

AIA Document A232™ – 2019. Copyright © 1992, 2009, and 2019 by The American Institute of Architects. **All rights reserved. WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law.** To report copyright violations of AIA Contract Documents, e-mail The American Institute of Architects' legal counsel, copyright@aia.org.

discrepancies or defects in the construction or operations by the Owner or Separate Contractors or other Contractors that are not apparent.

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

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

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

§ 6.3 Owner's Right to Clean Up

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

ARTICLE 7 CHANGES IN THE WORK

§ 7.1 General

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

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

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

§ 7.2 Change Orders

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

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

§ 7.3 Construction Change Directives

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

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

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

.1 Mutual acceptance of a lump sum properly itemized and supported by sufficient substantiating data to permit evaluation;
.2 Unit prices stated in the Contract Documents or subsequently agreed upon;

Sample

AIA Document A232™ – 2019. Copyright © 1992, 2009, and 2019 by The American Institute of Architects. **All rights reserved. WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law.** To report copyright violations of AIA Contract Documents, e-mail The American Institute of Architects' legal counsel, copyright@aia.org.

.3 Cost to be determined in a manner agreed upon by the parties and a mutually acceptable fixed or percentage fee; or

.4 As provided in Section 7.3.4.

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

.1 Costs of labor, including applicable payroll taxes, fringe benefits required by agreement or custom, workers' compensation insurance, and other employee costs approved by the Construction Manager and Architect;

.2 Costs of materials, supplies, and equipment, including cost of transportation, whether incorporated or consumed;

.3 Rental costs of machinery and equipment, exclusive of hand tools, whether rented from the Contractor or others;

.4 Costs of premiums for all bonds and insurance, permit fees, and sales, use, or similar taxes, directly related to the change; and

.5 Costs of supervision and field office personnel directly attributable to the change.

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

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

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

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

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

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

§ 7.4 Minor Changes in the Work

The Architect may order minor changes in the Work that are consistent with the intent of the Contract Documents and do not involve an adjustment in the Contract Sum or an extension of the Contract Time. The Architect's order for minor changes shall be in writing. If the Contractor believes that the proposed minor change in the Work will affect the Contract Sum or Contract Time, the Contractor shall notify the Construction Manager and shall not proceed to implement the change in the Work. If the Contractor performs the Work set forth in the Architect's order for a minor

Sample

AIA Document A232™ – 2019. Copyright © 1992, 2009, and 2019 by The American Institute of Architects. **All rights reserved. WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law.** To report copyright violations of AIA Contract Documents, e-mail The American Institute of Architects' legal counsel, copyright@aia.org.

change without prior notice to the Construction Manager that such change will affect the Contract Sum or Contract Time, the Contractor waives any adjustment to the Contract Sum or extension of the Contract Time.

ARTICLE 8 TIME

§ 8.1 Definitions

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

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

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

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

§ 8.2 Progress and Completion

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

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

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

§ 8.3 Delays and Extensions of Time

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

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

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

ARTICLE 9 PAYMENTS AND COMPLETION

§ 9.1 Contract Sum

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

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

§ 9.2 Schedule of Values

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

Sample

AIA Document A232™ – 2019. Copyright © 1992, 2009, and 2019 by The American Institute of Architects. **All rights reserved. WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law.** To report copyright violations of AIA Contract Documents, e-mail The American Institute of Architects' legal counsel, copyright@aia.org.

accuracy as the Construction Manager and the Architect may require, and unless objected to by the Construction Manager or the Architect, shall be used as a basis for reviewing the Contractor's subsequent Applications for Payment.

§ 9.3 Applications for Payment

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

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

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

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

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

§ 9.4 Certificates for Payment

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

§ 9.4.2 Where there is more than one Contractor performing portions of the Project, the Construction Manager will, within seven days after the Construction Manager receives all of the Contractors' Applications for Payment: (1) review the Applications and certify the amount the Construction Manager determines is due each of the Contractors; (2) prepare a Summary of Contractors' Applications for Payment by combining information from each Contractor's application with information from similar applications for progress payments from the other Contractors; (3) prepare a Project Application and Certificate for Payment; (4) certify the amount the Construction Manager determines is due all Contractors; and (5) forward the Summary of Contractors' Applications for Payment and Project Application and Certificate for Payment to the Architect.

§ 9.4.2.1 Within seven days after the Architect receives the Project Application and Project Certificate for Payment and the Summary of Contractors' Applications for Payment from the Construction Manager, the Architect will either (1)

Sample

AIA Document A232™ – 2019. Copyright © 1992, 2009, and 2019 by The American Institute of Architects. **All rights reserved. WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law.** To report copyright violations of AIA Contract Documents, e-mail The American Institute of Architects' legal counsel, copyright@aia.org.

issue to the Owner a Project Certificate for Payment, with a copy to the Construction Manager; or (2) issue to the Owner a Project Certificate for Payment for such amount as the Architect determines is properly due, and notify the Construction Manager and Owner of the Architect's reasons for withholding certification in part as provided in Section 9.5.1; or (3) withhold certification of the entire Project Application for Payment, and notify the Construction Manager and Owner of the Architect's reason for withholding certification in whole as provided in Section 9.5.1. The Construction Manager will promptly forward the Architect's notice of withholding certification to the Contractors.

§ 9.4.3 The Construction Manager's certification of an Application for Payment or, in the case of more than one Contractor, a Project Application and Certificate for Payment, shall be based upon the Construction Manager's evaluation of the Work and the data in the Application or Applications for Payment. The Construction Manager's certification will constitute a representation that, to the best of the Construction Manager's knowledge, information, and belief, the Work has progressed to the point indicated, the quality of the Work is in accordance with the Contract Documents, and that the Contractor is, or Contractors are, entitled to payment in the amount certified.

§ 9.4.4 The Architect's issuance of a Certificate for Payment or, in the case of more than one Contractor, Project Application and Certificate for Payment, shall be based upon the Architect's evaluation of the Work, the recommendation of the Construction Manager, and data in the Application for Payment or Project Application for Payment. The Architect's certification will constitute a representation that, to the best of the Architect's knowledge, information, and belief, the Work has progressed to the point indicated, the quality of the Work is in accordance with the Contract Documents, and that the Contractor is, or Contractors are, entitled to payment in the amount certified.

§ 9.4.5 The representations made pursuant to Sections 9.4.3 and 9.4.4 are subject to an evaluation of the Work for conformance with the Contract Documents upon Substantial Completion, to results of subsequent tests and inspections, to correction of minor deviations from the Contract Documents prior to completion, and to specific qualifications expressed by the Construction Manager or Architect.

§ 9.4.6 The issuance of a Certificate for Payment or a Project Certificate for Payment will not be a representation that the Construction Manager or Architect has (1) made exhaustive or continuous on-site inspections to check the quality or quantity of the Work; (2) reviewed construction means, methods, techniques, sequences, or procedures; (3) reviewed copies of requisitions received from Subcontractors and suppliers and other data requested by the Owner to substantiate the Contractor's right to payment; or (4) made examination to ascertain how or for what purpose the Contractor has used money previously paid on account of the Contract Sum.

§ 9.5 Decisions to Withhold Certification

§ 9.5.1 The Construction Manager or Architect may withhold a Certificate for Payment or Project Certificate for Payment in whole or in part, to the extent reasonably necessary to protect the Owner, if in the Construction Manager's or Architect's opinion the representations to the Owner required by Section 9.4.3 and 9.4.4 cannot be made. If the Construction Manager or Architect is unable to certify payment in the amount of the Application, the Construction Manager will notify the Contractor and Owner as provided in Section 9.4.1 and 9.4.2. If the Contractor, Construction Manager and Architect cannot agree on a revised amount, the Architect will promptly issue a Certificate for Payment or a Project Certificate for Payment for the amount for which the Architect is able to make such representations to the Owner. The Construction Manager or Architect may also withhold a Certificate for Payment or, because of subsequently discovered evidence, may nullify the whole or a part of a Certificate for Payment or Project Certificate for Payment previously issued, to such extent as may be necessary in the Construction Manager's or Architect's opinion to protect the Owner from loss for which the Contractor is responsible, including loss resulting from the acts and omissions described in Section 3.3.2 because of

.1 defective Work not remedied;
.2 third party claims filed or reasonable evidence indicating probable filing of such claims, unless security acceptable to the Owner is provided by the Contractor;
.3 failure of the Contractor to make payments properly to Subcontractors or suppliers for labor, materials or equipment;
.4 reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum;
.5 damage to the Owner or a Separate Contractor or other Contractor;
.6 reasonable evidence that the Work will not be completed within the Contract Time, and that the unpaid balance would not be adequate to cover actual or liquidated damages for the anticipated delay; or
.7 repeated failure to carry out the Work in accordance with the Contract Documents.

Sample

AIA Document A232™ – 2019. Copyright © 1992, 2009, and 2019 by The American Institute of Architects. **All rights reserved. WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law.** To report copyright violations of AIA Contract Documents, e-mail The American Institute of Architects' legal counsel, copyright@aia.org.

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

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

§ 9.5.4 If the Architect or Construction Manager withholds certification for payment under Section 9.5.1, the Owner may, at its sole option, issue joint checks to the Contractor and to any Subcontractor or supplier to whom the Contractor failed to make payment for Work properly performed or material or equipment suitably delivered. If the Owner makes payments by joint check, the Owner shall notify the Architect and the Construction Manager, and both will reflect such payment on the next Certificate for Payment.

§ 9.6 Progress Payments

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

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

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

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

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

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

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

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

§ 9.7 Failure of Payment

If the Construction Manager and Architect do not issue a Certificate for Payment or a Project Certificate for Payment, through no fault of the Contractor, within fourteen days after the Construction Manager's receipt of the Contractor's Application for Payment, or if the Owner does not pay the Contractor within seven days after the date established in the

Sample

AIA Document A232™ – 2019. Copyright © 1992, 2009, and 2019 by The American Institute of Architects. **All rights reserved. WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law.** To report copyright violations of AIA Contract Documents, e-mail The American Institute of Architects' legal counsel, copyright@aia.org.

Contract Documents, the amount certified by the Construction Manager and Architect or awarded by binding dispute resolution, then the Contractor may, upon seven additional days' notice to the Owner, Construction Manager and Architect, stop the Work until payment of the amount owing has been received. The Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable costs of shutdown, delay and start-up, plus interest as provided for in the Contract Documents.

§ 9.8 Substantial Completion

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

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

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

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

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

§ 9.9 Partial Occupancy or Use

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

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

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

Sample

AIA Document A232™ – 2019. Copyright © 1992, 2009, and 2019 by The American Institute of Architects. **All rights reserved. WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law.** To report copyright violations of AIA Contract Documents, e-mail The American Institute of Architects' legal counsel, copyright@aia.org.

§ 9.10 Final Completion and Final Payment

§ 9.10.1 Upon completion of the Work, the Contractor shall forward to the Construction Manager a notice that the Work is ready for final inspection and acceptance, and shall also forward to the Construction Manager a final Contractor's Application for Payment. Upon receipt, the Construction Manager shall perform an inspection to confirm the completion of Work of the Contractor. The Construction Manager shall make recommendations to the Architect when the Work of all of the Contractors is ready for final inspection, and shall then forward the Contractors' notices and Application for Payment or Project Application for Payment, to the Architect, who will promptly make such inspection. When the Architect finds the Work acceptable under the Contract Documents and the Contract fully performed, the Construction Manager and Architect will promptly issue a final Certificate for Payment or Project Certificate for Payment stating that to the best of their knowledge, information and belief, and on the basis of their on-site visits and inspections, the Work has been completed in accordance with the Contract Documents and that the entire balance found to be due the Contractor and noted in the final Certificate is due and payable. The Construction Manager's and Architect's final Certificate for Payment or Project Certificate for Payment will constitute a further representation that conditions listed in Section 9.10.2 as precedent to the Contractor's being entitled to final payment have been fulfilled.

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

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

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

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

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

ARTICLE 10 PROTECTION OF PERSONS AND PROPERTY

§ 10.1 Safety Precautions and Programs

The Contractor shall be responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the performance of the Contract. The Contractor shall submit the Contractor's safety program to the Construction Manager for review and coordination with the safety programs of other Contractors. The Construction Manager's responsibilities for review and coordination of safety programs shall not extend to direct control over or charge of the acts or omissions of the Contractors, Subcontractors, agents or employees of the Contractors or

Sample

AIA Document A232™ – 2019. Copyright © 1992, 2009, and 2019 by The American Institute of Architects. **All rights reserved. WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law.** To report copyright violations of AIA Contract Documents, e-mail The American Institute of Architects' legal counsel, copyright@aia.org.

Subcontractors, or any other persons performing portions of the Work and not directly employed by the Construction Manager.

§ 10.2 Safety of Persons and Property

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

.1 employees on the Work and other persons who may be affected thereby;

.2 the Work and materials and equipment to be incorporated therein, whether in storage on or off the site, under care, custody, or control of the Contractor, a Subcontractor, or a Sub-subcontractor;

.3 other property at the site or adjacent thereto, such as trees, shrubs, lawns, walks, pavements, roadways, structures, and utilities not designated for removal, relocation, or replacement in the course of construction; and

.4 construction or operations by the Owner, Separate Contractors, or other Contractors.

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

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

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

§ 10.2.5 The Contractor shall promptly remedy damage and loss (other than damage or loss insured under property insurance required by the Contract Documents) to property referred to in Sections 10.2.1.2, 10.2.1.3 and 10.2.1.4 caused in whole or in part by the Contractor, a Subcontractor, a Sub-subcontractor, or anyone directly or indirectly employed by any of them, or by anyone for whose acts they may be liable and for which the Contractor is responsible under Sections 10.2.1.2, 10.2.1.3 and 10.2.1.4. The Contractor may make a Claim for the cost to remedy the damage or loss to the extent such damage or loss is attributable to acts or omissions of the Owner, Construction Manager or Architect or anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable, and not attributable to the fault or negligence of the Contractor. The foregoing obligations of the Contractor are in addition to the Contractor's obligations under Section 3.18.

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

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

§ 10.2.8 Injury or Damage to Person or Property

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

§ 10.3 Hazardous Materials

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

Sample

AIA Document A232™ – 2019. Copyright © 1992, 2009, and 2019 by The American Institute of Architects. **All rights reserved. WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law.** To report copyright violations of AIA Contract Documents, e-mail The American Institute of Architects' legal counsel, copyright@aia.org.

§ 10.3.2 Upon receipt of the Contractor's notice, the Owner shall obtain the services of a licensed laboratory to verify the presence or absence of the material or substance reported by the Contractor and, in the event such material or substance is found to be present, to cause it to be rendered harmless. Unless otherwise required by the Contract Documents, the Owner shall furnish in writing to the Contractor, Construction Manager and Architect the names and qualifications of persons or entities who are to perform tests verifying the presence or absence of the material or substance or who are to perform the task of removal or safe containment of the material or substance. The Contractor, the Construction Manager and the Architect will promptly reply to the Owner in writing stating whether or not any of them has reasonable objection to the persons or entities proposed by the Owner. If the Contractor, Construction Manager or Architect has an objection to a person or entity proposed by the Owner, the Owner shall propose another to whom the Contractor, the Construction Manager and the Architect have no reasonable objection. When the material or substance has been rendered harmless, Work in the affected area shall resume upon written agreement of the Owner and Contractor. By Change Order, the Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable additional costs of shutdown, delay, and start-up.

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

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

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

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

§ 10.4 Emergencies

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

ARTICLE 11 INSURANCE AND BONDS

§ 11.1 Contractor's Insurance and Bonds

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

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

Sample

AIA Document A232™ – 2019. Copyright © 1992, 2009, and 2019 by The American Institute of Architects. **All rights reserved. WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law.** To report copyright violations of AIA Contract Documents, e-mail The American Institute of Architects' legal counsel, copyright@aia.org.

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

§ 11.1.4 Notice of Cancellation or Expiration of Contractor's Required Insurance. Within three (3) business days of the date the Contractor becomes aware of an impending or actual cancellation or expiration of any insurance required by the Contract Documents, the Contractor shall provide notice directly to the Owner, and separately to the Construction Manager, of such impending or actual cancellation or expiration. Upon receipt of notice from the Contractor, the Owner shall, unless the lapse in coverage arises from an act or omission of the Owner, have the right to stop the Work until the lapse in coverage has been cured by the procurement of replacement coverage by the Contractor. The furnishing of notice by the Contractor shall not relieve the Contractor of any contractual obligation to provide any required coverage.

§ 11.2 Owner's Insurance

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

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

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

§ 11.3 Waivers of Subrogation

§ 11.3.1 The Owner and Contractor waive all rights against (1) each other and any of their subcontractors, sub-subcontractors, agents, and employees, each of the other; (2) the Construction Manager and Construction Manager's consultants; (3) the Architect and Architect's consultants; (4) other Contractors and any of their subcontractors, sub-subcontractors, agents, and employees; and (5) Separate Contractors, if any, and any of their subcontractors, sub-subcontractors, agents, and employees, for damages caused by fire, or other causes of loss, to the extent those losses are covered by property insurance required by the Agreement or other property insurance applicable to the Project, except such rights as they have to proceeds of such insurance. The Owner or Contractor, as appropriate, shall require similar written waivers in favor of the individuals and entities identified above from the Construction Manager, Construction Manager's consultants, Architect, Architect's consultants, other Contractors, Separate Contractors, subcontractors, and sub-subcontractors. The policies of insurance purchased and maintained by each person or entity agreeing to waive claims pursuant to this Section 11.3.1 shall not prohibit this waiver of subrogation. This waiver of subrogation shall be effective as to a person or entity (1) even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, (2) even though that person or entity did not pay the insurance premium directly or indirectly, or (3) whether or not the person or entity had an insurable interest in the damaged property.

Sample

AIA Document A232™ – 2019. Copyright © 1992, 2009, and 2019 by The American Institute of Architects. **All rights reserved. WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law.** To report copyright violations of AIA Contract Documents, e-mail The American Institute of Architects' legal counsel, copyright@aia.org.

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

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

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

§ 11.5 Adjustment and Settlement of Insured Loss

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

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

ARTICLE 12 UNCOVERING AND CORRECTION OF WORK

§ 12.1 Uncovering of Work

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

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

§ 12.2 Correction of Work

§ 12.2.1 Before Substantial Completion

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

§ 12.2.2 After Substantial Completion

§ 12.2.2.1 In addition to the Contractor's obligations under Section 3.5, if, within one year after the date of Substantial Completion of the Work or designated portion thereof, or after the date for commencement of warranties established under Section 9.9.1, or by terms of any applicable special warranty required by the Contract Documents, any of the

Sample

AIA Document A232™ – 2019. Copyright © 1992, 2009, and 2019 by The American Institute of Architects. **All rights reserved. WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law.** To report copyright violations of AIA Contract Documents, e-mail The American Institute of Architects' legal counsel, copyright@aia.org.

Work is found to be not in accordance with the requirements of the Contract Documents, the Contractor shall correct it promptly after receipt of notice from the Owner to do so, unless the Owner has previously given the Contractor a written acceptance of such condition. The Owner shall give such notice promptly after discovery of the condition. During the one-year period for correction of Work, if the Owner fails to notify the Contractor and give the Contractor an opportunity to make the correction, the Owner waives the rights to require correction by the Contractor and to make a claim for breach of warranty. If the Contractor fails to correct nonconforming Work within a reasonable time during that period after receipt of notice from the Owner, Construction Manager or Architect, the Owner may correct it in accordance with Section 2.5.

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

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

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

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

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

§ 12.3 Acceptance of Nonconforming Work

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

ARTICLE 13 MISCELLANEOUS PROVISIONS

§ 13.1 Governing Law

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

§ 13.2 Successors and Assigns

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

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

§ 13.3 Rights and Remedies

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

Sample

AIA Document A232™ – 2019. Copyright © 1992, 2009, and 2019 by The American Institute of Architects. **All rights reserved. WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law.** To report copyright violations of AIA Contract Documents, e-mail The American Institute of Architects' legal counsel, copyright@aia.org.

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

§ 13.4 Tests and Inspections

§ 13.4.1 Tests, inspections, and approvals of portions of the Work shall be made as required by the Contract Documents and by applicable laws, statutes, ordinances, codes, rules, and regulations or lawful orders of public authorities. Unless otherwise provided, the Contractor shall make arrangements for such tests, inspections, and approvals with an independent testing laboratory or entity acceptable to the Owner, or with the appropriate public authority, and shall bear all related costs of tests, inspections, and approvals. The Contractor shall give the Construction Manager and Architect timely notice of when and where tests and inspections are to be made so that the Construction Manager and Architect may be present for such procedures. The Owner shall bear costs of tests, inspections, or approvals that do not become requirements until after bids are received or negotiations concluded. The Owner shall directly arrange and pay for tests, inspections, or approvals where building codes or applicable laws or regulations so require.

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

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

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

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

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

§ 13.5 Interest

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

ARTICLE 14 TERMINATION OR SUSPENSION OF THE CONTRACT

§ 14.1 Termination by the Contractor

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

.1 Issuance of an order of a court or other public authority having jurisdiction that requires all Work to be stopped;

.2 An act of government, such as a declaration of national emergency, that requires all Work to be stopped;

.3 Because the Construction Manager has not certified or the Architect has not issued a Certificate for Payment and has not notified the Contractor of the reason for withholding certification as provided in Section 9.4, or because the Owner has not made payment on a Certificate for Payment within the time stated in the Contract Documents; or

.4 The Owner has failed to furnish to the Contractor reasonable evidence as required by Section 2.2.

Sample

AIA Document A232™ – 2019. Copyright © 1992, 2009, and 2019 by The American Institute of Architects. **All rights reserved. WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law.** To report copyright violations of AIA Contract Documents, e-mail The American Institute of Architects' legal counsel, copyright@aia.org.

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

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

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

§ 14.2 Termination by the Owner for Cause

§ 14.2.1 The Owner may terminate the Contract if the Contractor

.1 repeatedly refuses or fails to supply enough properly skilled workers or proper materials;

.2 fails to make payment to Subcontractors or suppliers in accordance with the respective agreements between the Contractor and the Subcontractors or suppliers;

.3 repeatedly disregards applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of a public authority; or

.4 otherwise is guilty of substantial breach of a provision of the Contract Documents.

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

.1 Exclude the Contractor from the site and take possession of all materials, equipment, tools, and construction equipment and machinery thereon owned by the Contractor;

.2 Accept assignment of subcontracts pursuant to Section 5.4; and

.3 Finish the Work by whatever reasonable method the Owner may deem expedient. Upon written request of the Contractor, the Owner shall furnish to the Contractor a detailed accounting of the costs incurred by the Owner in finishing the Work.

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

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

§ 14.3 Suspension by the Owner for Convenience

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

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

.1 that performance is, was, or would have been, so suspended, delayed, or interrupted, by another cause for which the Contractor is responsible; or

.2 that an equitable adjustment is made or denied under another provision of this Contract.

Sample

AIA Document A232™ – 2019. Copyright © 1992, 2009, and 2019 by The American Institute of Architects. **All rights reserved. WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law.** To report copyright violations of AIA Contract Documents, e-mail The American Institute of Architects' legal counsel, copyright@aia.org.

§ 14.4 Termination by the Owner for Convenience

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

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

.1 cease operations as directed by the Owner in the notice;

.2 take actions necessary, or that the Owner may direct, for the protection and preservation of the Work; and

.3 except for Work directed to be performed prior to the effective date of termination stated in the notice, terminate all existing subcontracts and purchase orders and enter into no further subcontracts and purchase orders.

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

ARTICLE 15 CLAIMS AND DISPUTES

§ 15.1 Claims

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

§ 15.1.2 Time Limits on Claims

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

§ 15.1.3 Notice of Claims

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

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

§ 15.1.4 Continuing Contract Performance

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

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

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

Sample

AIA Document A232™ – 2019. Copyright © 1992, 2009, and 2019 by The American Institute of Architects. **All rights reserved. WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law.** To report copyright violations of AIA Contract Documents, e-mail The American Institute of Architects' legal counsel, copyright@aia.org.

§ 15.1.6 Claims for Additional Time

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

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

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

.1 damages incurred by the Owner for rental expenses, for losses of use, income, profit, financing, business and reputation, and for loss of management or employee productivity or of the services of such persons; and

.2 damages incurred by the Contractor for principal office expenses including the compensation of personnel stationed there, for losses of financing, business and reputation, and for loss of profit except anticipated profit arising directly from the Work.

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

§ 15.2 Initial Decision

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

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

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

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

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

Sample

AIA Document A232™ – 2019. Copyright © 1992, 2009, and 2019 by The American Institute of Architects. **All rights reserved. WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law.** To report copyright violations of AIA Contract Documents, e-mail The American Institute of Architects' legal counsel, copyright@aia.org.

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

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

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

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

§ 15.3 Mediation

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

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

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

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

§ 15.4 Arbitration

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

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

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

Sample

AIA Document A232™ – 2019. Copyright © 1992, 2009, and 2019 by The American Institute of Architects. **All rights reserved. WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law.** To report copyright violations of AIA Contract Documents, e-mail The American Institute of Architects' legal counsel, copyright@aia.org.

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

§ 15.4.4 Consolidation or Joinder

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

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

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

Sample

AIA Document A232™ – 2019. Copyright © 1992, 2009, and 2019 by The American Institute of Architects. **All rights reserved. WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law.** To report copyright violations of AIA Contract Documents, e-mail The American Institute of Architects' legal counsel, copyright@aia.org.

SECTION 00 7300

SUPPLEMENTARY GENERAL CONDITIONS

THE FOLLOWING SUPPLEMENTS MODIFY THE GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION, AIA DOCUMENT A232, 2007 EDITION. WHERE A PORTION OF THE GENERAL CONDITIONS IS MODIFIED OR DELETED BY THESE SUPPLEMENTARY CONDITIONS, THE REMAINING UNALTERED PORTIONS OF THE GENERAL CONDITIONS SHALL REMAIN IN AS IS.

ARTICLE 1 GENERAL PROVISIONS

1.1 **Basic Definitions**

Add to Subparagraph 1.1.4 - The Project as follows:

1.1.4 The project is more completely defined under Section 01 1000, Summary of the Work.

1.2 **Correlation and Intent of the Contract Documents**

Add to Subparagraph 1.2.1 as follows:

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

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

In the case of an inconsistency between Drawings and Specifications or within either Document not clarified by addendum, the better quality or greater quantity of work shall be provided in accordance with the Architect's interpretation.

The Contractor shall not 'scale' the Contract Document drawings to define dimensions or locations of building walls, columns, etc. Review dimensioned drawings to define required locations, if not indicated, coordinate and review with the Architect prior to continuing construction.

ADD NEW SUBPARAGRAPH 1.2.4 AS FOLLOWS:

1.2.4 The omission of minor details of construction, installation, material or other essential items of usual or standard construction from the drawings or specifications shall not relieve the Contractor from furnishing the same in place complete. Such omission shall not entitle this Contractor to make claims for extras on material or labor.

ARTICLE 2 OWNER

2.3 **Information and Services Required of the Owner**

Delete Subparagraph 2.3.5. and substitute the following:

2.3.5 The Architect will furnish to the General Contractor a complete set of electronic format construction documents (drawings and specifications) for the project. It will then be the General Contractors responsibility to distribute said documents, either electronic or hard copy to his Subcontractors that will be necessary for the execution of the work.

ARTICLE 3 CONTRACTOR

3.6 **Taxes**

Delete Subparagraph 3.6.1 and substitute the following:

3.6.1 Beginning January 1, 1996, the State of Utah provided an exemption from sales tax for construction materials purchased for public education. The exemption applies to all construction materials purchased by or on behalf of institutions of the public education system, provided the construction materials are clearly identified and installed or converted to real property which is owned by the public education institution. It is the intent of the Murray City School District to take advantage of the tax exemption on all construction material used in the Riverview Junior High School Replacement - BP 03 . The Owner can take advantage of this exemption by structuring its agreements with its Contractor and suppliers so that title to construction material passes from the supplier to the Owner or the Contractor (on behalf of the Owner) upon delivery to the construction site after January 1, 1996. Tax exempt form TC-721 must be used by the vendors when purchasing construction materials. The Owner will provide a Form TC-721, signed by the Murray City School District Director of Purchasing, or designee, authorizing the exemption of sales tax on material purchases for the Contractor's use in purchasing materials. Refer to State Tax Commission, Publication 35, Rev. 6/96 or Tax Bulletin 16-96.

3.7 **Permits, Fees, Notices and Compliance with Laws**

Delete Subparagraph 3.7.1 and substitute the following:

3.7.1 The Contractor shall secure and the Owner shall pay for any permits, fees and inspections required by work included in this Contract. All licensing shall be secured and paid for by the Contractor.

Modify Subparagraph 3.7.4 as follows:

3.7.4 Three (3) days in lieu of fourteen (14) days.

Modify Subparagraph 3.7.5 as follows:

3.7.5 Amend the first sentence in this subparagraph to read, “If, in the course of the Work, the Contractor encounters human remains or recognizes the existence of burial markers, wetlands or hazardous waste deposits not indicated in the Contract Documents, the Contractor shall immediately suspend any operations that would affect them and shall notify the Owner and Architect.”

3.8 Allowances

Modify Subparagraph 3.8.2.1 as follows:

.1 Allowances shall cover the total cost to the Contractor of materials and equipment delivered to the site, labor, installation costs, overhead and profit, other expenses contemplated, and all required taxes (if any) less applicable trade discounts.

Omit Subparagraph 3.8.2.2.

No changes to Subparagraph 3.8.2.3.

Add Subparagraph 3.8.2.4 as follows:

.4 At closeout of contract, funds remaining in Contingency Allowance will be credited to the Owner by Change Order.

3.10 Contractor's Construction and Submittal Schedules

Modify Subparagraph 3.10.1 as follows:

3.10.1 In the first sentence change the word "promptly" to "within seven days of Owner/Architect acceptance of Subcontractor List”.

Add new Subparagraph 3.10.1.1 as follows:

.1 The Contractor shall show this information in the form of either C.P.M. or bar graph.

Modify Subparagraph 3.10.2 as follows:

3.10.2 In the first sentence change the word “promptly” to “within seven (7) days of Owner/Architect acceptance of Subcontractor List”.

3.10.2 Substitute the words, "Architect's Review," for "Architect's Approval," in this paragraph.

3.11 **Documents and Samples at the Site**

Add new Subparagraph 3.11.1 as follows:

3.11.1 The Contractor shall also be responsible for providing a work table and dedicated set of documents with addenda, change orders, etc. for use only by the special inspector.

3.12 **Shop Drawings, Product Data and Samples**

Modify Subparagraph 3.12.8 as follows:

3.12.8 Substitute the words, " Review," for " Approval," in this paragraph.

ARTICLE 4 ARCHITECT AND CONSTRUCTION MANAGER

4.2 **Administration of the Contract**

Modify Subparagraph 4.2.11 as follows:

4.2.11 Omit the words, "and approve" and add “and review” in the first sentence in this subparagraph.

4.2.11 Amend the last sentence in this subparagraph to read, "The Architect's review of a specific item shall not indicate approval of the item or the assembly of which the item is a component."

ARTICLE 5 SUBCONTRACTORS

5.2 **Award of Subcontracts and other Contracts for Portions of the Work**

Modify Subparagraph 5.2.1 as follows:

a. 5.2.1 Omit the words, "as soon as practicable" and add "No later than twenty four (24) hours"

Modify Subparagraph 5.2.4 as follows:

5.2.4 The Contractor shall not change a Subcontractor, person or entity previously selected without written notification and acceptance of the Owner and Architect.

ARTICLE 6

CONSTRUCTION BY THE OWNER OR BY SEPARATE CONTRACTORS

No modifications.

ARTICLE 7 CHANGES IN THE WORK

Replace 7.2 Change Orders as follows

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

1 The change in the Work;

2 The amount of the adjustment, if any, in the Contract Sum; and

3 The extent of the adjustment, if any, in the Contract Time.

7.2.2 Markup Percentage Fee:

.1. Net amount of less than $5,000. Percentage Fee to be paid to any Contractor (regardless of tier) on self performed work shall be a single markup percentage not to exceed 15% of the net amount.

.2. Net amount of $5,000 or greater. Percentage Fee to be paid to any Contractor (regardless of tier) on self performed work shall be a single markup percentage not to exceed 10% of the net amount.

.3. The Markup Percentage Fee to be paid to any Contractor (regardless of tier) on any Subcontractor Work shall be a single percentage not to exceed 5% of the total allowable cost of sublet Work.

7.2.3 Change Order Proposals

.1 Change Order proposals require itemization. Details to be submitted will include a material and labor quantity take off and related pricing information and extensions from each subcontractor and material supplier.

ARTICLE 8 TIME

8.2 Progress and Completion

Add new Subparagraph 8.2.4 as follows:

8.2.4 Substantial completion of the Work shall be achieved as stipulated on Bid Form and in Owner/Contractor Agreement..

ARTICLE 9 PAYMENTS AND COMPLETION

9.3 Applications for Payment

Add the following sentence to Subparagraph 9.3.1:

9.3.1 The form of Application for Payment shall be notarized AIA Documents G732 Application and Certificate for Payment and G703 Continuation Sheet.

Add new Subparagraph 9.3.1.3 as follows:

9.3.1.3 Until the Work is one hundred percent (100%) complete, the Owner shall pay ninety-five percent (95%) of the amount due the Contractor on account of progress payments.

Add new Subparagraph 9.3.1.4 as follows:

9.3.1.4 The initial contract payment shall not be approved by the Construction Manager and Architect without a Contractor Master schedule having been prior approved by the Construction Manager. No subsequent monthly contract payment shall be approved by the Construction Manager or Architect without an approved updated contractor Master schedule.

9.6 Progress Payments

Modify Subparagraph 9.6.1 to read as follows:

9.6.1 Notice of extended payment provision. Application and certification for payment received by the fifth day of the month shall be reviewed and accepted or rejected by the tenth day of the month.

This Contract shall allow the Owner to make payment within thirty (30) days after acceptance of billings.

9.8 Substantial Completion

Add the following sentence to Subparagraph 9.8.5:

9.8.5 The payment shall be sufficient to increase the total payments to 100 percent of the Contract Sum, less such amounts the Architect and Construction Manager shall determine for incomplete Work and unsettled claims.

ADD NEW PARAGRAPH 9.11 AS FOLLOWS:

9.11 Liquidated Damages

9.11.1 The Contractor and the Contractor's surety shall be liable for and shall pay the Owner the sums hereinafter stipulated as **liquidated damages** for each calendar day of delay until the Work is complete: $2,500.00 per calendar day exceeding the GMP defined Substantial Completion date. $2,500.00 per day for days exceeding the 30 days from Substantial to Final completion date.

9.11.2 Should the Contractor fail to complete the Work within the time agreed upon in the Contract Documents, or within such additional time as may have been allowed by extension, there shall be deducted from any moneys due or that may become due the Contractor the sum as stated in paragraph 9.11.1. Such sum is fixed and agreed upon by the Owner and Contractor as liquidated damages due the Owner by reason of inconvenience and added costs of administration, engineering, and supervision resulting from the Contractor's default, and not as a penalty.

9.11.3 Permitting the Contractor to continue and finish the Work or any part of the Work after the time fixed for its completion, or after the date to which the time for completion may have been extended, shall in no way operate as a waiver on the part of the Owner of any of his rights under the Agreement.

ARTICLE 10

PROTECTION OF PERSONS AND PROPERTY

No modifications.

ARTICLE 11 INSURANCE AND BONDS

INSURANCE AND BONDS

The above policy shall name the Owner, Architect, and Construction Managert as additional insured.

Reference is made to Paragraph 3.18, Indemnification, of AIA Document A232

Contractor shall furnish the Owner with certificates of insurance complying with all requirements. The certificates shall be signed by a person authorized to bind coverage on the insurer's behalf. Coverage on a claims-made basis will not be acceptable.

11.1Contractor’s Insurance and Bonds

Add the following paragraph:

11.1.1.1 The Contractor shall provide insurance coverage for portions of the Work stored off the site after written approval of the Owner at the value established in the approval, and also for portions of the Work in transit.

Add the following paragraphs:

11.1.2.1 The Contractor shall furnish bonds covering faithful performance of the Contract and payment obligations arising there under. Costs of bonds shall be included in the Contractor's bid. The amount of each bond shall be equal to one hundred percent (100%) of the Contract Sum.

11.1.2.2 The Contractor shall deliver the required bonds to the Owner not later than three days following the date the Agreement is entered into.

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

11.3 Property Insurance

Delete Subparagraph 11.3.1.4 and substitute the following:

11.3.1.4 The Contractor shall provide insurance coverage for portions of the Work stored off the site after written approval of the Owner at the value established in the approval, and also for portions of the Work in transit.

11.4 Performance Bond and Payment Bond

Delete Subparagraph 11.4.1 and substitute the following:

11.4.1 The Contractor shall furnish bonds covering faithful performance of the Contract and payment obligations arising there under. Costs of bonds shall be included in the Contractor's bid. The amount of each bond shall be equal to one hundred percent (100%) of the Contract Sum.

11.4.1.1 The Contractor shall deliver the required bonds to the Owner not later than three days following the date the Agreement is entered into.

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

ARTICLE 12

UNCOVERING AND CORRECTION OF WORK

No modifications.

ARTICLE 13 MISCELLANEOUS PROVISIONS

13.5 Tests and Inspections

Modify Subparagraph 13.5.1 as follows:

13.5.1 Substitute the words, "review or reviews," wherever the words, "approve, approval, or approvals," occur in this paragraph.

ADD NEW PARAGRAPH 13.8 AS FOLLOWS:

13.8 Equal Opportunity

13.8.1 The Contractor shall maintain policies of employment as follows:

.1 The Contractor and the Contractor's Subcontractors shall not discriminate against any employee or applicant for employment because of race, religion, color, sex or national origin. The Contractor shall take affirmative action to ensure that applicants are employed, and that employees are treated during employment without regard to their race, religion, color, sex or national origin. Such action shall include, but not be limited to, the following: employment, upgrading, demotion or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices setting forth the policies of non-discrimination.

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

ADD NEW PARAGRAPH 13.9 AS FOLLOWS:

13.9 Compliance with Labor Laws

13.9.1 The Contractor and the Contractor's Subcontractors shall comply with all applicable Laws and Regulations relating to labor on Public Works in the State of Utah, including *U.S. Code Title 8 USC Sec.1324a, Utah Code Title 34 Chapter 30 ant Title 13 Chapter 47*:

13.9.2 The following references are included herein so that the Contractor shall be aware of specific requirements of these sections. Other Law sections are not shown herein, but this in no way relieves the Contractor of His obligation to comply with all Federal, State, and Local Labor Laws.

.1 ***U.S. Code Title 8 USC Sec. 1324a Unlawful Employment*** (1)(A) It is unlawful for a person or other entity - to hire, or to recruit or refer for a fee, for employment in the United States an alien knowing the alien in an unauthorized alien. (2) ***Continuing Employment*** - It is unlawful for a person or other entity, after hiring an alien for employment in accordance with paragraph (1) to continue to employ the alien in the United States knowing the alien in (or has become) an unauthorized alien with respect to such employment. (4) ***Use of labor through contract*** - For purposes of this section, a person or other entity who uses a contract, subcontract, or exchange, entered into, renegotiated, or extended after November 6, 1986, to obtain the labor of an alien in the United States knowing that the alien is an unauthorized alien (as defined in subsection (h)(3) in this section) with respect to performing such labor, shall be considered to have hired the alien for employment in the United States in violation of paragraph (1)(A).

.2 ***Ut Code 34-30-1. Citizens to be given preference*** - In employing workmen in the construction of public works by the state or any county or municipality, or by persons contracting with the state or any county or municipality, preference shall be give to citizens of the United States, or those having declared their intention of becoming citizens. In each contract for the construction of public works a provision shall be inserted to the effect that, if the provisions of this section are not complied with, the contract shall be void.

.3 ***Ut Code 34-30-8. Forty-hour work week*** - Forty hours shall constitute a working week on all works and undertakings carried on by the state, county, or municipal governments, or by any officer of the state or of any county or municipal government. Any persons, corporation, firm, contractor, agent, manager, or foreman, who shall require contract with any person to work upon such works or undertakings longer than 40 hours in one week shall pay such employees at at rate not less than one and one-half times the regular rate at which he is employed. (Piece work rates have to by greater than or equal to minimum wage and one and one-half times minimum wage for hours worked over 40; Minimum wage and overtime laws still apply).

.4 ***Ut Code 34-30-9. Violation of chapter*** - Any officer, agent, or representative if the state or of any political subdivision, district or municipality of it who shall violate, or omit to comply with any of the provisions of this chapter, and any contractor or subcontractor, or agent or representative thereof, doing such public work, who shall neglect to keep, or cause to be kept, an accurate record of the names, occupation and actual wages paid to each laborer, workman and mechanic employed by him, in connection with this public work or who shall refuse to allow access to same at any reasonable hour to any person authorized to inspect same under this chapter shall be guilty of a misdemeanor.

.5 ***Ut Code 13-47-201. Verification required for new hires*** - (1) A private employer who employs 15 or more employees as of July 1, 2010, may not hire a new employee on or after July 1, 2010, unless the private employer: (a) is registered with a status verification system to verify the federal legal working status of any new employee; and (b) uses the status verification system to verify the federal legal working status of the new employee in accordance with the requirements of the status verification system. (2) This section does not apply to a private employer of a foreign national if the foreign national holds a visa issued in response to a petition by the private employer that is classified as H-2A or H-2B.

ARTICLE 15 CLAIMS AND DISPUTES

15.1 Claims

Add this sentence to the end of Subparagraph 15.1.1:

15.1.1 A claim must contain the following explicit language in order to be recognized as a "Claim": **"THIS IS A CLAIM AS DEFINED BY CLAUSE 15.1.1 OF AIA DOCUMENT A232."**

Modify Subparagraph 15.1.3.1 as follows:

15.1.3.1 Substitute 10 days for 21 days, where the latter occurs in this subparagraph.

END OF SUPPLEMENTARY GENERAL CONDITIONS

Utah State Tax Commission

Exemption Certificate for Governments & Schools

(Sales, Use, Tourism and Motor Vehicle Rental Tax)

TC-721G
Rev. 3/16

Name of institution claiming exemption (purchaser)			Telephone Number	
Street Address		City	State	ZIP Code
Authorized Signature	Name (please print)		Title	
Name of Seller or Supplier:			Date	

SAMPLE

The person signing this certificate MUST check the applicable box showing the basis for which the exemption is being claimed.

Email questions to **taxmaster@utah.gov.** You may also write or visit the Tax Commission at 210 N 1950 W, Salt Lake City, UT 84134, or call 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: _____

☐ **FOREIGN DIPLOMAT**
I certify the purchases are authorized by a diplomatic tax exemption card issued by the United States.
Foreign diplomat number: _____

☐ **UTAH LOCAL GOVERNMENTS AND PUBLIC ELEMENTARY AND SECONDARY SCHOOLS**
Sales Tax License No. _____
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 local government, these construction materials will be installed or converted into real property by employees of this government entity.
CAUTION: This exemption does not apply to government or educational entities of other states and is not valid for lodging-related purchases.

☐ **UTAH STATE GOVERNMENT**
Sales Tax License No. _____
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 its essential functions. For construction materials, they will be installed or converted into real property by employees of this government entity.
CAUTION: This exemption does not apply to other states and is not valid for lodging-related purchases.

☐ **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.

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, email **taxada@utah.gov**, or call 801-297-3811 or TDD 801-297-2020. Please allow three working days for a response.

This page left intentionally blank.

00 9500

SECTION 01 2000

PRICE AND PAYMENT PROCEDURES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Procedures for preparation and submittal of applications for progress payments.
B. Documentation of changes in Contract Sum and Contract Time.
C. Change procedures.
D. Correlation of Contractor submittals based on changes.
E. Procedures for preparation and submittal of application for final payment.
F. Samples of AIA documents required are included and follow this Section:
    1. AIA G732 Application and Certificate for Payment.
    2. AIA G703 Continuation Sheet.

1.02 RELATED REQUIREMENTS

A. AIA Document A132 - Standard Form of Agreement Between Owner and Contractor: Contract Sum, retainages, and payment period.
B. AIA Document A232 - General Conditions and Document 00 7300 - Supplementary General Conditions: Additional requirements for progress payments, final payment, changes in the Work.

1.03 SCHEDULE OF VALUES

A. Form to be used: AIA G703.
B. Electronic media printout including equivalent information will be considered in lieu of standard form specified; submit draft to Architect and Construction Manager for approval.
C. Forms filled out by hand will not be accepted.
D. Submit Schedule of Values in duplicate within 15 days after date of Owner-Contractor Agreement.
E. Format: Utilize the Table of Contents of this Project Manual. Identify each line item with number and title of the specification section. Identify site mobilization.
F. Include in each line item, the amount of Allowances specified in this section. For unit cost Allowances, identify quantities taken from Contract Documents multiplied by the unit cost to achieve the total for the item.
G. Include separately from each line item, a direct proportional amount of Contractor's overhead and profit.
H. Revise schedule to list approved Change Orders, with each Application For Payment.

1.04 APPLICATIONS FOR PROGRESS PAYMENTS

A. Payment Period: Submit at intervals stipulated in the Agreement. (Normally 1 per month).
B. Form to be used: G732 and G703.
C. Electronic media printout including equivalent information will be considered in lieu of standard form specified; submit sample to Architect and Construction Manager for approval.
D. Forms filled out by hand will not be accepted.
E. For each item, provide a column for listing each of the following:
    1. Item Number.
    2. Description of Work.
    3. Scheduled Values.
    4. Previous Applications.

5. Work in Place and Stored Materials under this Application.
6. Authorized Change Orders.
7. Total Completed and Stored to Date of Application.
8. Percentage of Completion.
9. Balance to Finish.
10. Retainage (5%).

F. Execute certification by signature of authorized officer.

G. 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.

H. List each authorized Change Order as a separate line item, listing Change Order number and dollar amount as for an original item of work.

I. Submit one electronic and three hard-copies of each Application for Payment.

J. Include the following with the application:
1. Transmittal letter as specified for submittals in Section 01 3000.
2. Construction progress schedule, revised and current as specified in Section 01 3000.
3. Partial release of liens from major subcontractors and vendors.
4. Project record documents as specified in Section 01 7800, for review by Owner which will be returned to the Contractor.
5. Affidavits attesting to off-site stored products.

K. When Architect requires substantiating information, submit data justifying dollar amounts in question. Provide one copy of data with cover letter for each copy of submittal. Show application number and date, and line item by number and description.

L. Contractor, nor subcontractor will be allowed to bill over 90% of the contract amount until closeout documents have been submitted. This is irrespective of retention being held.

M. Notice of Extended Payment Provision: Application and Certificate of Payment received by the fifth day of the month shall be reviewed and accepted or rejected by the the tenth day to the month.

N. The Contract shall allow the Owner to make payment with thirty days after acceptance of all billings.

O. The initial contract payment shall not be approved by the Architect and Construction Manager without a Master Submittal Log having been previously approved by the Construction Manager. No subsequent monthly contract payment shall be approved by the Architect and Construction Manager without an approved updated Contract Master Schedule.

1.05 MODIFICATION PROCEDURES

A. Submit name of the individual authorized to receive change documents and who will be responsible for informing others in Contractor's employ or subcontractors of changes to Contract Documents.

B. For minor changes not involving an adjustment to the Contract Sum or Contract Time, Architect will issue instructions directly to Contractor.

C. 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. The document will describe the required changes and will designate method of determining any change in Contract Sum or Contract Time.

D. For changes for which advance pricing is desired, Architect will issue a document that includes a detailed description of a proposed change with supplementary or revised drawings and specifications, a change in Contract Time for executing the change Contractor shall prepare and submit a fixed price quotation within 7 days.

E. 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.

F. Computation of Change in Contract Amount: Costs for all changes shall be fully documented at each level for evaluation. Provide the following data:
   1. Quantities of materials, labor, and equipment and unit prices for each.
   2. Taxes, insurance, and bonds, if any.
   3. Predetermined unit prices if applicable.
   4. For Time and Material Work:
      a. Dates and times work was performed and by whom.
      b. Time records and wage reports.
      c. Invoices and receipts for products, equipment, and subcontracts, similarly documented.
   5. Overhead and Profit:
   6. Justification for any change in Contract Time.
   7. Credit for deletions from contract, similarly documented.

G. Allowable Mark-Up:
   1. Refer to 00 7300 Supplemental General Conditions

H. Execution of Change Orders: Architect will issue Change Orders for signatures of parties as provided in the Conditions of the Contract.

I. 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.

J. 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.

K. Promptly enter changes in Project Record Documents.

1.06 APPLICATION FOR FINAL PAYMENT

A. Prepare Application for Final Payment as specified for progress payments, identifying total adjusted Contract Sum, previous payments, and sum remaining due.

B. Application for Final Payment will not be considered until the following have been accomplished:
   1. All closeout procedures specified in Section 01 7700.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION 01 2000

This page intentionally left blank

AIA® Document G732™ – 2009

Application and Certificate for Payment, Construction Manager as Adviser Edition

TO OWNER:	**PROJECT:**	**APPLICATION NO:**	**DISTRIBUTION TO:**
			OWNER ☐
		PERIOD TO:	CONSTRUCTION MANAGER ☐
FROM CONTRACTOR:	**VIA CONSTRUCTION MANAGER:**	**CONTRACT DATE:**	ARCHITECT ☐
		PROJECT NOS: / /	CONTRACTOR ☐
			FIELD ☐
CONTRACT FOR:	**VIA ARCHITECT:**		OTHER ☐

CONTRACTOR'S APPLICATION FOR PAYMENT

Application is made for payment, as shown below, in connection with the Contract.
AIA Document G703™, Continuation Sheet, is attached.

1. ORIGINAL CONTRACT SUM ..... $

2. NET CHANGES IN THE WORK ..... $

3. CONTRACT SUM TO DATE *(Line 1 ± 2)* ..... $

4. TOTAL COMPLETED AND STORED TO DATE *(Column G on G703)* ..... $

5. RETAINAGE:

a. _____ % of Completed Work
(Column D + E on G703) $

b. _____ % of Stored Material
(Column F on G703) $

Total Retainage *(Lines 5a + 5b, or Total in Column I on G703)* ..... $

6. TOTAL EARNED LESS RETAINAGE ..... $
(Line 4 minus Line 5 Total)

7. LESS PREVIOUS CERTIFICATES FOR PAYMENT .....
(Line 6 from prior Certificate)

8. CURRENT PAYMENT DUE ..... $

9. BALANCE TO FINISH, INCLUDING RETAINAGE
(Line 3 minus Line 6) $

SUMMARY OF CHANGES IN THE WORK	ADDITIONS	DEDUCTIONS
Total changes approved in previous months by Owner	$	$
Total approved this month, including Construction Change Directives	$	$
TOTALS	$	$
NET CHANGES IN THE WORK	$	

The undersigned Contractor certifies that to the best of the Contractor's knowledge, information and belief the Work covered by this Application for Payment has been completed in accordance with the Contract Documents, that all amounts have been paid by the Contractor for Work for which previous Certificates for Payment were issued and payments received from the Owner, and that current payment shown herein is now due.

CONTRACTOR:

By: _____ Date: _____

State of:
County of:
Subscribed and sworn to before me this day of
Notary Public:
My Commission expires:

CERTIFICATE FOR PAYMENT

In accordance with the Contract Documents, based on evaluations of the Work and the data comprising this application, the Construction Manager and Architect certify to the Owner that to the best of their knowledge, information and belief the Work has progressed as indicated, the quality of the Work is in accordance with the Contract Documents, and the Contractor is entitled to payment of the AMOUNT CERTIFIED.

AMOUNT CERTIFIED ..... $

(Attach explanation if amount certified differs from the amount applied. Initial all figures on this Application and on the Continuation Sheet that are changed to conform with the amount certified.)

CONSTRUCTION MANAGER:

By: _____ Date: _____

ARCHITECT: *(NOTE: If Multiple Prime Contractors are responsible for performing portions of the Project, the Architect's Certification is not required.)*

By: _____ Date: _____

This Certificate is not negotiable. The AMOUNT CERTIFIED is payable only to the Contractor named herein. Issuance, payment and acceptance of payment are without prejudice to any rights of the Owner or Contractor under this Contract.

Sample

CAUTION: You should sign an original AIA Contract Document, on which this text appears in RED. An original assures that changes will not be obscured.

AIA Document G732™ – 2009 (formerly G702™CMa – 1992). Copyright © 1992 and 2009 by The American Institute of Architects. **All rights reserved.** **WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law.** Purchasers are permitted to reproduce ten (10) copies of this document when completed. To report copyright violations of AIA Contract Documents, e-mail The American Institute of Architects' legal counsel, copyright@aia.org .

AIA® Document G703™ – 1992

01 2030

Continuation Sheet

AIA Document, G702™–1992, Application and Certification for Payment, or G736™–2009, Project Application and Project Certificate for Payment, Construction Manager as Adviser Edition, containing Contractor's signed certification is attached.
In tabulations below, amounts are in US dollars.
Use Column I on Contracts where variable retainage for line items may apply.

APPLICATION NO: 001
APPLICATION DATE:
PERIOD TO:
ARCHITECT'S PROJECT NO:

A	B	C	D	E	F	G		H	I
ITEM NO.	DESCRIPTION OF WORK	SCHEDULED VALUE	WORK COMPLETED FROM PREVIOUS APPLICATION (D + E)	WORK COMPLETED THIS PERIOD	MATERIALS PRESENTLY STORED (NOT IN D OR E)	TOTAL COMPLETED AND STORED TO DATE (D+E+F)	% (G ÷ C)	BALANCE TO FINISH (C - G)	RETAINAGE (IF VARIABLE RATE)
		0.00	0.00	0.00	0.00	0.00	0.00 %	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00 %	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00 %	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00 %	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00 %	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00 %	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00 %	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00 %	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00 %	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00 %	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00 %	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00 %	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00 %	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00 %	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00 %	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00 %	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00 %	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00 %	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00 %	0.00	0.00
		0.00	0.00	0.00	0.00	0.00	0.00 %	0.00	0.00
	GRAND TOTAL	$0.00	$0.00	$0.00	$0.00	$0.00	0.00 %	$0.00	$0.00

AIA Document G703™ – 1992. Copyright © 1963, 1965, 1966, 1967,1970, 1978, 1983 and 1992 by The American Institute of Architects. **All rights reserved.** WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law. This document was produced by AIA software at 15:15:15 on 03/14/2016 under Order No.5579111420_1 which expires on 12/19/2016, and is not for resale.
User Notes:
(2016958256)

This page left intentionally blank.

01 2030

SECTION 01 2100

ALLOWANCES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Cash allowances.
B. Contingency allowance.
C. Payment and modification procedures relating to allowances.

1.02 RELATED REQUIREMENTS

A. Section 01 2000 - Price and Payment Procedures: Additional payment and modification procedures.

1.03 CASH ALLOWANCES

A. Costs Included in Cash Allowances: Cost of product to Contractor or subcontractor, less applicable trade discounts.
B. Architect Responsibilities:
   1. Consult with Contractor for consideration and selection of products, suppliers , and installers.
   2. Select products in consultation with Owner and transmit decision to Contractor.
   3. Prepare Change Order.
C. Contractor Responsibilities:
   1. Assist Architect in selection of products, suppliers, and installers.
   2. Obtain proposals from suppliers and installers and offer recommendations.
   3. On notification of which products have been selected, execute purchase agreement with designated supplier and installer.
   4. Arrange for and process shop drawings, product data, and samples. Arrange for delivery.
   5. Promptly inspect products upon delivery for completeness, damage, and defects. Submit claims for transportation damage.
D. Differences in costs will be adjusted by Change Order.

1.04 CONTINGENCY ALLOWANCE

A. Contractor's costs for products, delivery, installation, labor, insurance, payroll, taxes, bonding, equipment rental, overhead and profit will be included in Change Orders authorizing expenditure of funds from this Contingency Allowance.
B. Funds will be drawn from the Contingency Allowance only by Change Order.
C. At closeout of Contract, funds remaining in Contingency Allowance will be credited to Owner by Change Order.

1.05 ALLOWANCES SCHEDULE

A. Cash allowance of $___TBD___for residential appliances.
B. Unit allowance to furnish and install 15 unrated access doors, location to be determined during construction.
   1. Refer to section 08 3100 Access Doors and Panels.
C. Owner Contingency Allowance: Include the stipulated sum/price of $__TBD__for use upon Owner's instructions.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION 01 2100

SECTION 01 2200

UNIT PRICES

PART 1 GENERAL

1.01 SECTION INCLUDES

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

1.02 COSTS INCLUDED

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

1.03 UNIT QUANTITIES SPECIFIED

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

1.04 MEASUREMENT OF QUANTITIES

A. Measurement methods delineated in the individual specification sections complement the criteria of this section. In the event of conflict, the requirements of the individual specification section govern.
B. Take all measurements and compute quantities. Measurements and quantities will be verified by Architect and Murray City School District.
C. Assist by providing necessary equipment, workers, and survey personnel as required.
D. Stipulated Price Measurement: Items measured by weight, volume, area, or linear means or combination, as appropriate, as a completed item or unit of the Work.
E. Perform surveys required to determine quantities, including control surveys to establish measurement reference lines. Notify Architect prior to starting work.
F. Contractor's Engineer Responsibilities: Sign surveyor's field notes or keep duplicate field notes, calculate and certify quantities for payment purposes.

1.05 PAYMENT

A. Payment for Work governed by unit prices will be made on the basis of the actual measurements and quantities of Work that is incorporated in or made necessary by the Work and accepted by the Architect, multiplied by the unit price.
B. Payment will not be made for any of the following:
    1. Products wasted or disposed of in a manner that is not acceptable.
    2. Products determined as unacceptable before or after placement.
    3. Products not completely unloaded from the transporting vehicle.
    4. Products placed beyond the lines and levels of the required Work.
    5. Products remaining on hand after completion of the Work.
    6. Loading, hauling, and disposing of rejected Products.
C. Unit prices shall be used as a basis to adjust the contract through change order for the work described.

1.06 DEFECT ASSESSMENT

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

1.07 SCHEDULE OF UNIT PRICES

ITEM	DESCRIPTION	UNIT	UNIT COST
1	Additional specified 6ft chain link type 1 fabric fencing with 2 installed posts 10 lf	10 lf	
2	Additional (1) 4ft wide 6ft high specified chain link type 1 fabric swing gate	each	

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION 01 2200

SECTION 01 2300

ALTERNATES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Description of Alternates.
B. Procedures for pricing Alternates.
C. Documentation of changes to Contract Sum and Contract Time.

1.02 RELATED REQUIREMENTS

A. AIA Document A701 - Instructions to Bidders: Instructions for preparation of pricing for alternatives.
B. AIA Document A101 - Owner-Contractor Agreement: Incorporating monetary value of accepted alternatives.

1.03 COSTS INCLUDED

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

1.04 ACCEPTANCE OF ALTERNATES

A. Alternates quoted on Bid Forms will be reviewed and accepted or rejected at Owner's option. Accepted Alternates will be identified in the Owner-Contractor Agreement.
B. Coordinate related work and modify surrounding work to integrate the Work of each Alternate.

1.05 SCHEDULE OF ALTERNATES

A. Alternate No. 1 - Refer to pecification Section 10 7300 Insulated Translucent Fiberglass Sandwich Panel Structural Canopy System and site Development Drawings.
    1. Base Bid - Not Included.
    2. Alternate - Insulated translucent fiberglass sandwich panel structural canopy system and footing and foundation system.
B. Alternate No. 2 - Refer to Specification Section 11 6833 Athletic Filed Equipment and Site Development Drawings.
    1. Base Bid - Not Included.
    2. Alternate - Softball Field, Double Batting Tunnel Frame and Nets.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION 01 2300

SECTION 01 3000

ADMINISTRATIVE REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. General administrative requirements.
B. Electronic document submittal.
C. Preconstruction meeting.
D. Progress meetings.
E. One year warranty inspection meeting.
F. Coordination drawings.
G. Submittals for review, information, and project closeout.
H. Number of copies of submittals.
I. Requests for Information (RFI) procedures.
J. Submittal procedures.

1.02 RELATED REQUIREMENTS

A. AIA Document A232 - General Conditions and Supplementary Conditions: Dates for applications for payment and duties of the Construction Manager.
B. Section 01 3216 - Construction Progress Schedule: Form, content, and administration of schedules.
C. Section 01 7700 - Closeout Procedures: Additional coordination requirements.
D. Section 01 7800 - Closeout Submittals: Project record documents; operation and maintenance data; warranties and bonds.

1.03 GENERAL ADMINISTRATIVE REQUIREMENTS

A. Comply with requirements of Section 01 7700 - Closeout Procedures for coordination of execution of administrative tasks with timing of construction activities.

1.04 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 job site 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 1100 - Summary of Work.
F. Coordinate layout work under instructions of the Project Coordinator.
G. Make the following types of submittals to Architect through the Project Coordinator:
    1. Requests for Information.
    2. Requests for substitution.
    3. Shop drawings, product data, and samples.
    4. Test and inspection reports.
    5. Design data.
    6. Manufacturer's instructions and field reports.

7. Applications for payment and change order requests.
8. Progress schedules.
9. Coordination drawings.
10. Correction Punch List and Final Correction Punch List for Substantial Completion.
11. Closeout submittals.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 ELECTRONIC DOCUMENT SUBMITTAL

A. All documents transmitted for purposes of administration of the contract are to be in electronic (PDF) format.
   1. Besides submittals for review, information, and closeout, this procedure applies to Requests for Information (RFIs), progress documentation, contract modification documents (e.g. supplementary instructions, change proposals, change orders), applications for payment, field reports and meeting minutes, Contractor's correction punchlist, and any other document any participant wishes to make part of the project record.
   2. Project Manager, General Contractor and Architect are required to use the ProCore system as supplied by the Construction Manager for these documents.
   3. It is Contractor's and Subcontractor's responsibility to submit documents in PDF format.
   4. Users 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 or similar software).
   5. Paper document transmittals will not be reviewed.
   6. All other specified submittal and document transmission procedures apply, except that electronic document requirements do not apply to samples or color selection charts.

3.02 PRECONSTRUCTION MEETING

A. The Contractor will schedule a meeting after Notice of Award.
B. Attendance Required:
   1. Owner Representative.
   2. Architect.
   3. Construction Manager.
   4. General Contractor.
   5. Subcontractors.
C. Agenda:
   1. Execution of Owner-Contractor Agreement.
   2. Submission of executed bonds and insurance certificates.
   3. Distribution of Contract Documents.
   4. Submission of list of subcontractors, list of products, schedule of values, and progress schedule.
   5. Submission of initial Submittal schedule.
   6. Designation of personnel representing the parties to ContractInspector and .
   7. Procedures and processing of field decisions, submittals, substitutions, applications for payments, proposal request, Change Orders, and Contract closeout procedures.
   8. Tentative construction scheduling.
   9. Critical work sequencing.
   10. Procedures for processing Applications for Payment.
   11. Preparation of record documents.

12. Use of the premises.
13. Office, work and storage areas.
14. Equipment deliveries and priorities.
15. Safety procedures.
16. First aid.
17. Security.
18. Housekeeping.
19. Working hours.
20. Specific instructions from the Owner and Construction Manager

D. The Construction Manager will record the minutes and distribute copies to participants, and those affected by decisions made.

3.03 PROGRESS MEETINGS

A. Schedule and administer meetings throughout progress of the Work at maximum of weekly intervals.
B. Make arrangements for meetings, prepare agenda with copies for participants, preside at meetings.
C. Attendance Required: Job superintendent, major Subcontractors and suppliers, Owner Representative, Architect, Construction Manager, Engineers, and Inspectors as appropriate to agenda topics for each meeting.
D. Agenda:
   1. Review minutes of previous meetings.
   2. Review of work progress.
   3. Field observations, problems, and decisions.
   4. Identification of problems that impede, or will impede, planned progress.
   5. Review of submittals schedule and status of submittals.
   6. Review of RFIs log and status of responses.
   7. Review of off-site fabrication and delivery schedules.
   8. Maintenance of progress schedule.
   9. Corrective measures to regain projected schedules.
   10. Planned progress during succeeding work period.
   11. Coordination of projected progress.
   12. Maintenance of quality and work standards.
   13. Effect of proposed changes on progress schedule and coordination.
   14. Other business relating to work.
E. Record minutes and distribute copies within two days after meeting to participants, with copies to Architect, Owner, participants, and those affected by decisions made.

3.04 ONE YEAR WARRANTY INSPECTION (MANDATORY)

A. The Contractor will be required to visit the site one year after Substantial Completion with the assigned representative of the Murray City School District and the Architect to review warranty issues. A warranty punch list will be issued and the General Contractor will be responsible to complete these warranty items. Additional inspections will take place as required.

3.05 CONSTRUCTION PROGRESS SCHEDULE- SEE SECTION 01 3216

3.06 COORDINATION DRAWINGS

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

3.07 REQUESTS FOR INFORMATION (RFI)

A. Definition: A request seeking one of the following:
   1. An interpretation, amplification, or clarification of some requirement of Contract Documents arising from inability to determine from them the exact material, process, or system to be installed; or when the elements of construction are required to occupy the same space (interference); or when an item of work is described differently at more than one place in Contract Documents.
   2. A resolution to an issue which has arisen due to field conditions and affects design intent.

B. 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.
   2. Prepare in a format and with content acceptable to Owner.
   3. Combine RFI and its attachments into a single electronic file. PDF format is preferred.

C. 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. 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.

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

3.08 SUBMITTALS FOR REVIEW

A. When the following are specified in individual sections, submit them for review:
   1. Product data.
   2. Shop drawings.
   3. Samples for selection.
   4. Samples for verification.

B. Submit to Architect for review for the limited purpose of checking for compliance with information given and the design concept expressed in Contract Documents.

C. Samples will be reviewed for aesthetic, color, or finish selection.

D. After review, provide copies and distribute in accordance with SUBMITTAL PROCEDURES article below and for record documents purposes described in Section 01 7800 - Closeout Submittals.

E. Note that substitutions for specified/approved products/manufacturers will not be reviewed if submitted as a part of submittal process.

3.09 SUBMITTALS FOR INFORMATION

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

B. Submit for Architect's knowledge as contract administrator or for Owner.

3.10 SUBMITTALS FOR PROJECT CLOSEOUT

A. Submit Correction Punch List prior to Substantial Completion.
B. Submit Final Correction Punch List prior to 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 / Guarantees.
   4. Bonds.
   5. Other types as indicated.

D. Submit for Owner's benefit during and after project completion.

3.11 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. Extra Copies at Project Closeout: See Section 01 7800.
C. 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.

3.12 SUBMITTAL PROCEDURES

A. General Requirements:
   1. Use a separate transmittal for each item.
   2. Submittals should be organized and numbered by spec section. For example: AA AAAA-BB-CC ‘A’s represent spec section. ‘B’s represent sequence number (if more than one submittal is required for each spec section,(ie. Casework for phase-1, phase-2, etc.). ‘C’s represent Revision number if submittal has to be resubmitted (wrong or incomplete information). (06 4100-01-00) Submittals can be broken up, this may be preferred for some sections. Items should only be submitted under their spec section number. This applies particularly to electrical and mechanical. If a sub is supplying items from multiple sections they should be submitted as separate submittals.
      a. Not withstanding the requirement to submit each specification section separately, mechanical and electrical submittals should be submitted as complete divisions.
   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. Send submittals in electronic format via email to Architect.
6. Identify variations from Contract Documents and product or system limitations that may be detrimental to successful performance of the completed work.
7. Provide space for Contractor and Architect review stamps.
8. 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. Do not submit (Material) Safety Data Sheets for materials or products.

C. Shop Drawing Procedures:
1. Shop Drawings: Shop drawings must be reviewed and stamped by the Prime Contractor prior to submittal to the Architect. (If the stamp is missing or if it is obvious shop drawings have not been reviewed by the Prime Contractor they will be returned for re-submittal unchecked by the Architect).
2. Prepare accurate, drawn-to-scale, original shop drawing documentation by interpreting Contract Documents and coordinating related work.
3. Do not reproduce Contract Documents to create shop drawings.
4. Generic, non-project-specific information submitted as shop drawings do not meet the requirements for shop drawings.

D. Samples Procedures:
1. Transmit related items together as single package.
2. Identify each item to allow review for applicability in relation to shop drawings showing installation locations.
3. Include with transmittal high-resolution image files of samples to facilitate electronic review and approval. Provide separate submittal page for each item image.

3.13 SUBMITTAL REVIEW

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

B. Architect's actions will be reflected by marking each returned submittal using virtual stamp on electronic submittals.
1. Notations may be made directly on submitted items and/or listed on appended Submittal Review cover sheet.

C. Architect's and consultants' actions on items submitted for review:
1. Authorizing purchasing, fabrication, delivery, and installation:
    a. "No Exception Taken" - no further action is required from Contractor.
    b. "Make Noted Corrections" - no further action is required from Contractor.
2. Not Authorizing fabrication, delivery, and installation:
    a. "Revise and Resubmit" - further action is required from Contractor.
        1) Resubmit revised item, with review notations acknowledged and incorporated.
    b. "Rejected" - further action is required from Contractor.
        1) Submit item complying with requirements of Contract Documents.

END OF SECTION 01 3000

SECTION 01 3216

CONSTRUCTION PROGRESS SCHEDULE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Preliminary schedule.
B. Construction progress schedule, bar chart type.

1.02 RELATED SECTIONS

A. Section 01 1100 - Summary of Work: Work sequence.

1.03 SUBMITTALS

A. Within 10 days after date of Agreement, submit preliminary scheduledefining planned operations for the first 60 days of Work, with a general outline for remainder of Work.
B. If preliminary schedule requires revision after review, submit revised schedule within 10 days.
C. Within 20 days after review of preliminary schedule, submit draft of proposed complete schedule for review.
    1. Include written certification that major contractors have reviewed and accepted proposed schedule.
D. Within 10 days after joint review, submit complete schedule.
E. Submit updated schedule with each Application for Payment.

1.04 QUALITY ASSURANCE

A. Contractor's Administrative Personnel: Three years minimum experience in using and monitoring CPM schedules on comparable projects.

1.05 SCHEDULE FORMAT

A. Listings: In chronological order according to the start date for each activity. Identify each activity with the applicable specification section number.
B. Scale and Spacing: To allow for notations and revisions.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 PRELIMINARY SCHEDULE

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

3.02 CONTENT

A. Show complete sequence of construction by activity, with dates for beginning and completion of each element of construction.
B. Identify each item by specification section number.
C. Show accumulated percentage of completion of each item, and total percentage of Work completed, as of the first day of each month.
D. Coordinate content with schedule of values specified in Section 01 2000 - Price and Payment Procedures.
E. Provide legend for symbols and abbreviations used.

3.03 BAR CHARTS

A. Include a separate bar for each major portion of Work or operation.
B. Identify the first work day of each week.

3.04 REVIEW AND EVALUATION OF SCHEDULE

A. Participate in joint review and evaluation of schedule with Construction Manager and Architect at each submittal.
B. Evaluate project status to determine work behind schedule and work ahead of schedule.
C. After review, revise as necessary as result of review, and resubmit within 10 days.
D. The initial contract payment shall not be approved by the Construction Manager and Architect without a Contractor Master schedule having been prior approved by the Construction Manager. No subsequent monthly contract payment shall be approved by the Construction Manager or Architect without an approved updated contractor Master schedule.

3.05 UPDATING SCHEDULE

A. Maintain schedules to record actual start and finish dates of completed activities.
B. Indicate progress of each activity to date, with projected completion date of each activity.
C. Update diagrams to graphically depict current status of Work.
D. Identify activities modified since previous submittal, major changes in Work, and other identifiable changes.
E. Indicate changes required to maintain Date of Substantial Completion.
F. Submit reports required to support recommended changes.

3.06 DISTRIBUTION OF SCHEDULE

A. Distribute copies of updated schedules to Procore for use by all parties
B. Instruct recipients to promptly report, in writing, problems anticipated by projections indicated in schedules.

SECTION 01 4000

QUALITY REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

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

1.02 RELATED REQUIREMENTS

A. AIA Document A201 - General Conditions: Inspections and approvals required by public authorities.
B. Section 01 3000 - Administrative Requirements: Submittal procedures.
C. Section 01 6000 - Product Requirements: Requirements for material and product quality.
D. Section 31 0000 - Geotechnical Investigation: Soil investigation data.

1.03 REFERENCE STANDARDS

A. ASTM C1021 - Standard Practice for Laboratories Engaged in Testing of Building Sealants; 2008 (Reapproved 2023).
B. ASTM C1077 - Standard Practice for Agencies Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Testing Agency Evaluation; 2017.
C. ASTM C1093 - Standard Practice for Accreditation of Testing Agencies for Masonry; 2023.
D. ASTM D3740 - Standard Practice for Minimum Requirements for Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction; 2023.
E. ASTM E329 - Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection; 2018.
F. ASTM E543 - Standard Specification for Agencies Performing Nondestructive Testing; 2021.
G. ASTM E699 - Standard Specification for Agencies Involved in Testing, Quality Assurance, and Evaluating of Manufactured Building Components; 2016.
H. IAS AC89 - Accreditation Criteria for Testing Laboratories; 2018.

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 Construction Manager.
    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.

G. Erection Drawings: Submit drawings for Architect's benefit as contract administrator or for Owner.
1. Submit for information for the limited purpose of assessing compliance with information given and the design concept expressed in the Contract Documents.
2. Data indicating inappropriate or unacceptable Work may be subject to action by Architect or Owner.

1.05 REFERENCES AND STANDARDS

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

1.06 TESTING AND INSPECTION AGENCIES AND SERVICES

A. Owner will employ and pay for services of an independent testing agency to perform other specified testing.
B. Contractor shall be responsible to schedule all specified testing and inspection.
C. Employment of agency in no way relieves Contractor of obligation to perform Work in accordance with requirements of Contract Documents.
D. Contractor Employed Agency:
1. Testing agency: Comply with requirements of ASTM E329, ASTM E543, ASTM E699, ASTM C1021, ASTM C1077, ASTM C1093, and ASTM D3740.
2. Inspection agency: Comply with requirements of ASTM D3740 and ASTM E329.
3. Laboratory Qualifications: Accredited by IAS according to IAS AC89.
4. Laboratory: Authorized to operate in the State in which the Project is located.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 CONTROL OF INSTALLATION

A. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce work of specified quality.
B. Comply with manufacturers' instructions, including each step in sequence.
C. Should manufacturers' instructions conflict with Contract Documents, request clarification from Architect before proceeding.
D. Comply with specified standards as minimum quality for the work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
E. Have work performed by persons qualified to produce required and specified quality.
F. Verify that field measurements are as indicated on shop drawings or as instructed by the manufacturer.
G. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, and disfigurement.

3.02 MOCK-UPS

A. Before installing portions of the Work where mock-ups are required,construct mock-ups in location and size indicated for each form of construction and finish required to comply with the following requirements, using materials indicated for the completed Work. The purpose of mock-up is to demonstrate the proposed range of aesthetic effects and workmanship.
B. Accepted mock-ups establish the standard of quality the Architect will use to judge the Work.
C. 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. Obtain Architect's approval of mock-ups before starting work, fabrication, or construction.
F. Accepted mock-ups shall be a comparison standard for the remaining Work.
G. 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. See individual specification sections for testing and inspection required.
B. Testing Agency Duties:
    1. Test samples of mixes submitted by Contractor.
    2. Provide qualified personnel at site. Cooperate with Architect , Construction Manager and Contractor in performance of services.
    3. Perform specified sampling and testing of products in accordance with specified standards.

4. Ascertain compliance of materials and mixes with requirements of Contract Documents.
5. Promptly notify Architect and Contractor of observed irregularities or non-compliance of Work or products.
6. Perform additional tests and inspections required by Architect.
7. Attend preconstruction meetings and progress meetings.
8. Submit reports of all tests/inspections specified.

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

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

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

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

3.05 MANUFACTURERS' FIELD SERVICES

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

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

3.06 DEFECT ASSESSMENT

A. Replace Work or portions of the Work not complying with specified requirements.

B. If, in the opinion of Architect, Construction Manager and Owner, it is not practical to remove and replace the Work, Architect will direct an appropriate remedy or adjust payment.

END OF SECTION 01 4000

SECTION 01 5000

TEMPORARY FACILITIES AND CONTROLS

PART 1 GENERAL

1.01 SECTION INCLUDES

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

1.02 RELATED REQUIREMENTS

A. Section 01 5100 - Temporary Utilities.

1.03 TEMPORARY UTILITIES - SEE SECTION 01 5100

1.04 TELECOMMUNICATIONS SERVICES

A. Provide, maintain, and pay for telecommunications services to field office at time of project mobilization.
B. Telecommunications services shall include:
    1. Windows-based personal computer dedicated to project tcommunications, with necessary software and printer.
    2. Telephone Lines: One line, minimum.
    3. Internet Connections: Continous highest speed available.

1.05 TEMPORARY SANITARY FACILITIES

A. Provide and maintain required facilities and enclosures. Provide at time of project mobilization.
B. Maintain daily in clean and sanitary condition.
C. At end of construction, return facilities to same or better condition as originally found.

1.06 BARRIERS

A. Provide barriers to prevent unauthorized entry to construction areas, to prevent access to areas that could be hazardous to workers or the public, to allow for owner's use of site and to protect existing facilities and adjacent properties from damage from construction operations and demolition.
B. Provide barricades and covered walkways required by governing authorities for public rights-of-way and for public access to existing building.
C. Protect non-owned vehicular traffic, stored materials, site, and structures from damage.

1.07 FENCING

A. Construction: Commercial grade chain link fence.
B. Provide 6 foot high fence around construction site; equip with vehicular and pedestrian gates with locks.

1.08 EXTERIOR ENCLOSURES

A. Provide temporary insulated weather tight closure of exterior openings to accommodate acceptable working conditions and protection for Products, to allow for temporary heating and maintenance of required ambient temperatures identified in individual specification sections, and to prevent entry of unauthorized persons. Provide access doors with self-closing hardware and locks.

1.09 SECURITY

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

1.10 VEHICULAR ACCESS AND PARKING

A. Comply with regulations relating to use of streets and sidewalks, access to emergency facilities, and access for emergency vehicles.
B. Coordinate access and haul routes with governing authorities, Construction Manager 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. Designated existing on-site roads may be used for construction traffic.
F. Provide temporary parking areas to accommodate construction personnel. When site space is not adequate, provide additional off-site parking.

1.11 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 weekly.
C. If materials to be recycled or re-used on the project must be stored on-site, provide suitable non-combustible containers; locate containers holding flammable material outside the structure unless otherwise approved by the authorities having jurisdiction.
D. Open free-fall chutes are not permitted. Terminate closed chutes into appropriate containers with lids.

1.12 PROJECT IDENTIFICATION

A. Provide project identification sign of design and construction indicated on drawings.
B. Sign Materials:
    1. Structure and Framing: New, wood or metal, structurally adequate.
    2. Sign Surfaces: Exterior grade plywood with medium density overlay, minimum 3/4 inch (19 mm) thick, standard large sizes to minimize joints, painted white.
    3. Rough Hardware: Galvanized.
    4. Lettering: Exterior quality paint, contrasting colors.
C. Project Identification Sign:
    1. One painted sign, 32 sq ft (3 sq m) area, bottom 6 feet (2 m) above ground.
    2. Content:
        a. Project title, logo and name of Owner as indicated on Contract Documents.
        b. Names and titles of Construction Manager, Architect and Consultants.
        c. Name of Prime Contractor and Major Subcontractors.
    3. Graphic design, colors, style of lettering: Designated by Architect.
D. Installation:

1. Install project identification sign within 30 days after date fixed by Notice to Proceed.
2. Erect at location of high public visibility, adjacent to main entrance to site.
3. Erect supports and framing on secure foundation, rigidly braced and framed to resist wind loadings.
4. Install sign surface plumb and level, with butt joints. Anchor securely.

E. No other signs are allowed without Owner permission except those required by law.

1.13 FIELD OFFICES, JOB TRAILERS, AND MATERIAL STOCKPILE AREA

A. Coordinate with Governing Authorities, Construction Manager, Owner, and neighboring properties.
B. Office: Weathertight, with lighting, electrical outlets, heating, cooling equipment, and equipped with sturdy furniture, drawing rack, and drawing display table.
C. Provide space for Project meetings, with table and chairs to accommodate 12 persons minimum.
D. Locate offices a minimum distance of 20 feet from existing and new structures.
E. The contractor shall provide secure separate, lockable, heated and cooled, ventilated office trailer space for the Construction Manager staff for the entire duration of the project to include a 45’ trailer with an office at each end. The trailer shall be furnished with 2 desks and office chairs, at least an 8 ft. table with 8 chairs, a plan table of sufficient size to fit a full size set of the construction documents. The trailer shall have continuous internet access and power. The Construction Manager staff shall be provided with access to drinking water and sanitary facilities.

1.14 TEMPORARY FIRE PROTECTION

A. Until fire protection needs are supplied by permanent facilities, install and maintain temporary fire protection facilities of the types needed to protect against reasonably predictable and controllable fire losses. Comply with IFC 906, "Code for Portable Fire Extinguishers", and IBC Chapter 33 and IFC Chapter 14 "Fire Safety During Construction".
    1. Locate fire extinguishers where convenient and effective for their intended purpose, but not less than one extinguisher on each floor.
    2. Store combustible materials in containers in fire-safe locations.
    3. Maintain unobstructed access to fire extinguishers, fire hydrants, temporary fire protection facilities. Prohibit smoking in hazardous fire exposure areas.
    4. Provide supervision of welding operations, combustion type temporary heating units, and similar sources of fire ignition.

1.15 REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS

A. Remove temporary utilities, equipment, facilities, materials, prior to Date of Substantial Completion inspection.
B. Remove underground installations to a minimum depth of 2 feet. Grade site as indicated.
C. Clean and repair damage caused by installation or use of temporary work.
D. Restore existing facilities used during construction to original condition.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION 01 5000

This page intentionally left blank

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 RELATED REQUIREMENTS

A. Section 01 5000 - Temporary Facilities and Controls:
   1. Temporary telecommunications services for administrative purposes.
   2. Temporary sanitary facilities required by law.

1.03 TEMPORARY ELECTRICITY

   1. Use of temporary metered connection: By Contractor

B. Provide power service required from utility source.
C. Power Service Characteristics: 208 volt, three phase, four wire / 120 volt, single phase.
D. Provide power outlets for construction operations, with branch wiring and distribution boxes located at each floor. Provide flexible power cords as required.
E. Provide main service disconnect and over-current protection at convenient location and meter.
F. Permanent convenience receptacles may be utilized during construction.
G. Provide adequate distribution equipment, wiring, and outlets to provide single phase branch circuits for power and lighting.
   1. Provide 20 ampere, duplex outlets, single phase for circuits for power tools.
   2. Provide 20 ampere, single phase branch circuits for lighting.

1.04 TEMPORARY LIGHTING FOR CONSTRUCTION PURPOSES

A. Provide and maintain incandescent lighting for construction operations to achieve a minimum lighting level of 2 watt/sq ft .
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.
D. Permanent building lighting may be utilized during construction.

1.05 TEMPORARY HEATING

A. Cost of Energy:
   1. Use of portable fuel source: By Contractor.
B. Provide heating devices and heat as needed to maintain specified conditions for construction operations.
C. Maintain minimum ambient temperature of 50 degrees F in areas where construction is in progress, unless indicated otherwise in specifications.
D. Existing facilities shall not be used.
E. Prior to operation of permanent equipment for temporary heating purposes, verify that installation is approved for operation, equipment is lubricated and filters are in place. Provide and pay for operation, maintenance, and regular replacement of filters and worn or consumed parts.

1.06 TEMPORARY WATER SERVICE

A. Cost of Water Used:

1. Use of temporary metered connection: By Contractor.

B. Provide and maintain suitable quality water service for construction operations at time of project mobilization.

C. Extend branch piping with outlets located so water is available by hoses with threaded connections. Provide temporary pipe insulation to prevent freezing.

END OF SECTION 01 5100

SECTION 01 56 39

TEMPORARY TREE AND PLANT PROTECTION

PART 1 - GENERAL

1.1 SUMMARY

A. The work of this Section consists of providing all equipment and materials and doing all work necessary for protection of existing trees, shrubs, landscape, wetlands, and other plant materials from damage as a result of the Contractor's operations, as indicated on the Contract Documents and as specified. Tree and plant protection shall include, but not be limited to:
   1. Tree protection fencing.
   2. Boxing of tree trunks.
   3. Root pruning.
   4. All other tree and plant protection indicated.

1.2 REFERENCES

A. The following standards shall apply to the work of this Section.
   1. International Society of Arboriculture (ISA): Guide for Plant Appraisal

1.3 SUBMITTALS

A. Proposed methods, materials, and schedule for tree and plant protection shall be submitted for approval. This should include a plan showing points of access to and from the site and show a workable system of onsite haul routes that protect existing landscape and wetland areas designated for protection. This plan should be submitted to the Landscape Architect for review and comment prior to commencement of work.

B. Proposed methods, materials, and schedule for root pruning and tree fertilization shall be submitted for approval.

C. Certifications: Submit appropriate evidence of certification of all arborists to be employed on the Project.

D. Licenses: Submit appropriate evidence of licensing of all chemical applicators to be employed on the Project.

E. MSDS: Submit Material Safety Data Sheets (MSDS) of all chemicals to be applied on the Project.

F. Photo Documentation: Prior to beginning any site operations, Contractor shall photograph all existing trees and plant material inside the project work limit line, and within 15’ of the project work limit line.

G. At least 30 days prior to ordering materials, the Contractor shall submit to the Owner’s Representative, representative samples, certifications, manufacturer's product data and certified test results for materials as specified below. No materials shall be ordered or delivered until the required submittals have been reviewed and approved by the Owner’s Representative. Delivered materials shall closely match the approved samples. Approval

shall not constitute final acceptance. The Owner's Representative reserves the right to reject, on or after delivery, any material that does not meet these Specifications.

1.4 QUALITY ASSURANCE

A. Work of root pruning, fertilizing, spraying, and similar activities shall be undertaken only by certified Arborists and chemical applicators, as pertinent to the work being performed.

1. Application of chemicals shall be performed by licensed chemical applicators.
2. Arborist shall be a professional Certified Arborist with a minimum five years' experience, who has successfully completed a certification program.

1.5 LIABILITY FOR DAMAGES

A. The Contractor shall be liable for all damage and/or disturbance to existing trees and shrubs not otherwise designated for removal. For bidding and general work guidelines prior to on-site tree protection conference, the Contractor shall assume all trees within the Limit of Work shall be saved unless specifically designated to be removed on the Plans. Actual charges for damage to plants shall be in accordance with the schedules defined herein, with assessed charges to be deducted from sums payable under the Construction Contract.

1. Damage which, in the Owner's Representative's opinion, can be remedied by corrective maintenance shall be repaired immediately.
2. Trees or shrubs which are damaged irreparably shall, at the Owner's Representative's discretion, be replaced by the Contractor with new trees or shrubs of the same size and type.
3. If replacement of damaged trees is not feasible as determined by the Owner's Representative, the full replacement costs will be assessed to the Contractor's account at values based upon the square inches of cross-sectional area of trunk (measured at 4 ft. above grade), in accordance with the Trunk Formula Method described in the ISA Guide described herein, and the following table:

   $75.00/square inch for trees less than or equal to 6-inch diameter
   $50.00/square inch for trees greater than 6 inch and less than 18-inch diameter
   $40.00/square inch for trees greater than or equal to 18-inch diameter

B. Damaged trees or shrubs which require removal and/or replacement shall be removed according to the Specification requirements for removals, including refilling and repair of ground surface, with such costs to be borne by the Contractor in addition to assessed charges described herein.

C. The Contractor shall be liable for all damage and/or disturbance to existing adjacent lands beyond the Limit of Work. Actual damage to these areas, caused by the Contractor, shall be repaired to the satisfaction of the Owner's Representative, at no additional cost to the Owner. Repairs may include pruning or removing damaged vegetation in accordance with current horticultural practices, replacement of damaged vegetation, restoration of the ground plane to its original condition, and any other work required to restore the area to its original condition as depicted in the site photographs taken at the beginning of construction. The project will not be accepted until all repair work is complete.

1.6 DAMAGE PENALTIES

A. A fine of $1,000 will be levied against the Contractor for each incident of construction damage inside tree protection areas.

B. Visible damage to the tree trunks or to tree roots within the protected areas will cause the Owner to withhold from the Contractor an amount in accordance with and as described under Paragraph titled, Liability for Damages, in this Section, for a period of two years. After that period the impact of the damage will be assessed by the Owner's Representative and Owner. If in the opinion of the Owner's Representative or Owner, the tree is in fair to good health the damage fine will be refunded; if the tree is in poor condition or lost the fine will not be refunded.

1.7 ON-SITE PRECONSTRUCTION CONFERENCE

A. Before the start of any work on the site, preceding the arrival of equipment, materials, or vehicles to the site, and prior to the commencement of any clearing on the site, the Contractor shall arrange a preconstruction conference on the site with the Owner's Representative to identify trees and shrubs that are to be protected or removed. The Contractor shall not commence with clearing and grubbing prior to having a clear understanding of existing conditions to be preserved. In addition to the responsibilities and penalties described in this part of the specification, the Contractor shall be held responsible for any and all clearing, damage or destruction to plant material that results from the Contractor's failure to schedule and attend the preconstruction conference on site. In the event of said clearing, damage, or destruction, the Contractor will be assessed the full penalties described in this Section.

PART 2 - PRODUCTS

2.1 TREE PROTECTION FENCING

A. Tree protection fencing shall be equal to the following:
   1. New high density polyethylene laminar netting. Mesh dimensions shall be 3-3/4 in. x 2 in. with 1/2 in. strands. Fabric color shall be safety orange.
   2. Stakes for fencing shall be 6 ft. long wood or metal drive stakes, commonly used to support fencing. Attachment shall be by staples to wood or wiring to metal.
   3. Unless otherwise indicated, height of fencing shall be 6 ft.

B. Tree protection fence is not to be substituted for construction security fencing.

2.2 BOXING

A. Existing trees indicated to remain, and which may, in the Owner's Representative's opinion, be damaged by the Contractor's equipment and operations shall be protected by boxing.

B. Boxing shall be 4 in. x 4 in. with two 2 in. x 4 in. rails. Box shall be approximately 8 ft. x 8 ft. in size centered on the tree trunk, to a height of approximately 6 ft.

2.3 FERTILIZER

A. Fertilizer shall be a commercial product complying with State and Federal fertilizer laws. Deliver to the site in the original unopened containers that shall bear the manufacturer's certificate of compliance covering analysis. Liquid fertilizer for subsurface hydraulic injection to correct soil nutrient deficiencies shall be a product meeting the requirements of ANSI 300 and as modified by this paragraph. Liquid fertilizer shall include a slow-release form of nitrogen (50% of N to be water insoluble), phosphorus and potassium; shall be chloride free; shall have a low salt content; and shall have a wetting agent to aid with

dispersion. Fertilizer shall contain required micro-nutrients established by soil test analysis.

PART 3 - EXECUTION

3.1 IDENTIFICATION OF TREES AND SHRUBS TO REMAIN

A. **Before any clearing is done, the Contractor shall arrange a conference on the site with the Landscape Architect and Owner's Representative to identify trees and shrubs that are to be protected or removed.** The Contractor shall not commence with clearing and grubbing prior to having a clear understanding of existing conditions to be preserved.

B. The Contractor shall be responsible for the protection of all existing trees and plants designated to remain for the length of the construction period, including liability for all damages as specified herein. The placement of protection devices additional to those specified shall, however, be at the Contractor's discretion and with no additional cost to the Owner.

3.2 PROTECTION OF EXISTING TREES AND SHRUBS

A. Trees to remain within work area shall have tree protection fencing, posts, and bracing erected.

1. Protection shall be maintained throughout the duration of the Project. Fencing does not relieve the Contractor of other protection responsibilities.
2. Repair or replace trees indicated to remain which are damaged by construction operations, in a manner acceptable to Owner's Representative. Employ licensed arborist to repair damage to trees.
3. Such trees which are injured due to the Contractor's operations to such a degree that, in the opinion of the Owner's Representative, their usefulness or appearance are significantly impaired, shall be replaced with equivalent items at the Contractor's expense.

B. Materials, debris, fill, or equipment shall not be stored or operated under the dripline of existing trees which are to remain, except as actually required to construct the proposed work in those areas.

C. Tree protection fencing, posts, and bracing shall be provided at the tree's drip line to protect existing trees from damage during construction. In the case of trees with a small dripline, the fencing shall be a minimum of 6' from the tree trunk.

D. Where construction activities must occur within the dripline of an existing tree to remain, the contractor shall protect said trees by the following method:
1. Boxing of Tree with Wood: Boxing shall be 4 in. x 4 in. posts with two 2 in. x 4 in. rails. Box shall be approximately 8 ft. x 8 ft. in size centered on the tree trunk, to a height of approximately 6 ft. Provide bracing so as to avoid driving posts/rods/stakes into the ground within the tree drip line.

E. Water trees and other vegetation to remain within Limits of Contract work as required to maintain their health during course of construction operations. Hand water plant material if necessary.

3.3 TREE CUTTING, PRUNING AND REMOVAL

A. Pruning shall be performed in accordance with current horticultural practices.

B. Tree removal shall be performed in accordance with the requirements of current horticultural practices.

C. Trees and plants designated to be saved shall be protected during pruning operations and all subsequent construction. The Contractor shall provide the handwork necessary to complete pruning operations without damage to adjacent trees in accordance with current horticultural practices, of this Contract. The Contractor shall provide the means necessary to prevent scrapes and scars to trunks and branches, and such damage shall require the Contractor to be assessed as previously specified above, or to replace damaged material to the satisfaction of the Owner's Representative.

3.4 ROOT PRUNING

A. Where construction will be in close proximity to existing trees designated to remain, roots shall be pruned prior to trenching and tunneling operations. Root pruning shall be performed as early as possible before trenching or tunneling operations. Proximity shall be as determined in the field by the Owner's Representative.

B. Root pruning is the physical cutting of tree roots to minimize root damage and promote healing. Root prune using a sharpened spade for all roots smaller than one inch diameter. Root prune using an ax or chainsaw for all roots greater than one inch diameter. Any method which tears roots or disturbs the soil beyond the grading limit is unacceptable. Backhoe buckets or any other excavating machine to root prune is not allowed.

C. Backfill root pruning trench with existing soil mixed with peat moss to a mixture of approximately 75% loam and 25% humus by volume. Tamp soil in six-inch lifts. Each lift shall be compacted to a point at which a footprint makes only a 1/16-inch impression.

D. Apply mulch to a depth of 4 inches at minimum 10 ft. to 15 ft. radius around tree to reduce compaction and increase moisture retention. Pull mulch 6-inches away from tree trunk.

3.5 FERTILIZING

A. Fertilization of designated trees shall be by soil injection of liquid fertilizer. The fertilizer shall be mixed with water and injected into the soil under pressure using a hydraulic sprayer and a feeding needle.

B. Sprayer pressure shall be set to 100-200 psi.

C. Injection points shall be spaced 3 feet on center beneath the dripline of the tree. Place the first band of injections approximately 1/4 the distance from the trunk to the edge of the dripline. Successive bands shall be spaced 3 feet apart out to one to three feet beyond the edge of the dripline.

D. The feeding needle shall be inserted twelve to eighteen inches into the soil. Rotate the feeding needle by 90 degrees during the injection process to ensure distribution of the fertilizer in all directions.

E. The liquid fertilizer shall be a suspension grade fertilizer design to be mixed and applied in water using a high-volume hydraulic sprayer.

F. Mixing and application rates shall be in accordance with the soil test report

recommendations to an approved area under the dripline. Strong mechanical agitation shall be applied to maintain suspension. Use a 3 foot by 3 foot injection spacing.

G. Fertilizing of all trees shall occur at the completion of the Work. But under no circumstances shall fertilization be delayed more than one planting season. Should construction be delayed for any reason, the Contractor shall be required to fertilize all designated trees disturbed up to the time of the construction delay.

3.6 REMOVAL OF TREE AND SHRUB PROTECTION MATERIAL

A. Contractor shall remove and discard in a legal manner all tree protection material, excavated soil, pruned vegetation and all debris and trash from the site at the completion of the Contract.

END OF SECTION 01 56 39

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.
F. Coordinate submittal of the S.W.P.P.P. with the owner.

1.02 RELATED REQUIREMENTS

A. Section 03 3000 - Cast-in-Place Concrete: Concrete for temporary and permanent erosion control structures indicated on drawings.
B. Section 31 2200 - Grading: Temporary and permanent grade changes for erosion control.
C. Section 32 1123 - Aggregate Base Courses: Temporary and permanent roadways.

1.03 REFERENCE STANDARDS

A. ASTM D4355/D4355M - Standard Test Method for Deterioration of Geotextiles by Exposure to Light, Moisture and Heat in a Xenon Arc-Type Apparatus; 2014 (Reapproved 2018).
B. ASTM D4491/D4491M - Standard Test Methods for Water Permeability of Geotextiles by Permittivity; 2017.
C. ASTM D4491 - Standard Test Methods for Water Permeability of Geotextiles by Permittivity.; 1999a (Reapproved 2014).
D. ASTM D4533/D4533M - Standard Test Method for Trapezoid Tearing Strength of Geotextiles; 2015.
E. ASTM D4632/D4632M - Standard Test Method for Grab Breaking Load and Elongation of Geotextiles; 2015a.
F. ASTM D4751 - Standard Test Methods for Determining Apparent Opening Size of a Geotextile; 2020.
G. ASTM D4873/D4873M - Standard Guide for Identification, Storage, and Handling of Geosynthetic Rolls and Samples; 2017 (Reapproved 2021).
H. EPA (NPDES) - National Pollutant Discharge Elimination System (NPDES), Construction General Permit; Current Edition.
I. USDA TR-55 - Urban Hydrology for Small Watersheds; USDA Natural Resources Conservation Service; 2015.

1.04 PERFORMANCE REQUIREMENTS

A. Comply with requirements of EPA (NPDES) for erosion and sedimentation control, as specified by the NPDES, for Phases I and II, and in compliance with requirements of Construction General Permit (CGP), whether the project is required by law to comply or not.
B. Comply with requirements of State of Utah Erosion and Sedimentation Control Manual.
C. Runoff Calculation Standard for Urban Areas: USDA TR-55.
D. Develop and follow an Erosion and Sedimentation Prevention Plan and submit periodic inspection reports.

E. 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.
   1. Obtain and pay for permits and provide security required by authority having jurisdiction.
   2. Owner will withhold payment to Contractor equivalent to all fines resulting from non-compliance with applicable regulations.

F. 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.

G. Timing: Put preventive measures in place as soon as possible after disturbance of surface cover and before precipitation occurs.

H. 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.

I. 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.

J. 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.

K. 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.

L. 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.

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

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

1.05 SUBMITTALS

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

B. Erosion and Sedimentation Control Plan:
   1. Submit within 2 weeks after Notice to Proceed.
   2. 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.
   3. Obtain the approval of the Plan by authorities having jurisdiction.
   4. Obtain the approval of the Plan by Owner.
C. 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.
D. Inspection Reports: Submit report of each inspection; identify each preventive measure, indicate condition, and specify maintenance or repair required and accomplished.
E. Maintenance Instructions: Provide instructions covering inspection and maintenance for temporary measures that must remain after Substantial Completion.

PART 2 PRODUCTS

2.01 MATERIALS

A. Mulch: Use one of the following:
   1. Straw or hay.
   2. Wood waste, chips, or bark.
   3. Erosion control matting or netting.
   4. Cutback asphalt.
   5. Polyethylene film, where specifically indicated only.
B. Bales: Air dry, rectangular straw bales.
   1. Cross Section: 14 by 18 inches, minimum.
   2. Bindings: Wire or string, around long dimension.
C. Bale Stakes: One of the following, minimum 3 feet long:
   1. Steel U- or T-section, with minimum mass of 1.33 pound per linear foot.
   2. Wood, 2 by 2 inches in cross section.
D. 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, maximum, when tested in accordance with ASTM D4751.
   2. Permittivity: 0.05 sec^-1, minimum, when tested in accordance with ASTM D4491/D4491M.
   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, minimum, in cross-machine direction; 124 pounds-force, 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, minimum, when tested in accordance with ASTM D4533/D4533M.
7. Color: Manufacturer's standard, with embedment and fastener lines preprinted.
8. Manufacturers:
    a. TenCate: www.tencate.com.
    b. North American Green: www.nagreen.com.
    c. Propex Geosynthetics: www.geotextile.com.
    d. Substitutions: See Section 01 6000 - Product Requirements.

E. Silt Fence Posts: One of the following, minimum 5 feet long:
1. Steel U- or T-section, with minimum mass of 1.33 pound per linear foot.
2. Softwood, 4 by 4 inches in cross section.
3. Hardwood, 2 by 2 inches in cross section.

F. Gravel: See Section 32 1123 for aggregate.

G. Concrete: See Section 03 3000.

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, minimum.
2. Length: 50 feet, 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.
    b. Along the top of the slope or top bank of drainage channels and swales that traverse disturbed areas.
    c. Along the toe of cut slopes and fill slopes.
    d. Perpendicular to flow across the bottom of existing and new drainage channels and swales that traverse disturbed areas or carry runoff from disturbed areas; space at maximum of 200 feet apart.
    e. Across the entrances to culverts that receive runoff from disturbed areas.
2. Space sediment barriers with the following maximum slope length upslope from barrier:
    a. Slope of Less Than 2 Percent: 100 feet.
    b. Slope Between 2 and 5 Percent: 75 feet.
    c. Slope Between 5 and 10 Percent: 50 feet.
    d. Slope Between 10 and 20 Percent: 25 feet.
    e. Slope Over 20 Percent: 15 feet.

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 thickness of pine needles, sawdust, bark, wood chips, or shredded leaves, or 6 inches of straw or hay.
H. Mulching: Use only for areas that may be subjected to erosion for less than 6 months.
   1. Wood Waste: Use only on slopes 3:1 or flatter; no anchoring required.
   2. Asphalt: Use only where no traffic, either vehicular or pedestrian, is anticipated.

3.04 INSTALLATION

A. Traffic-Bearing Aggregate Surface:
   1. Excavate minimum of 6 inches.
   2. Place geotextile fabric full width and length, with minimum 12 inch overlap at joints.
   3. Place and compact at least 6 inches of 1 1/2 to 3 1/2 inch 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 high barriers with minimum 36 inch long posts spaced at 6 feet maximum, with fabric embedded at least 4 inches in ground.
   3. Where slope gradient is steeper than 3:1 or barriers will be in place over 6 months, use nominal 28 inch high barriers, minimum 48 inch long posts spaced at 6 feet maximum, with fabric embedded at least 6 inches in ground.
   4. Where slope gradient is steeper than 3:1 and vertical height of slope between barriers is more than 20 feet, use nominal 32 inch high barriers with woven wire reinforcement and steel posts spaced at 4 feet maximum, with fabric embedded at least 6 inches in ground.
   5. Install with top of fabric at nominal height and embedment as specified.
   6. Embed bottom of fabric in a trench on the upslope side of fence, with 2 inches of fabric laid flat on bottom of trench facing upslope; backfill trench and compact.
   7. Do not splice fabric width; minimize splices in fabric length; splice at post only, overlapping at least 18 inches, with extra post.
   8. Fasten fabric to wood posts using one of the following:
      a. Four nails per post with 3/4 inch diameter flat or button head, 1 inch long, and 14 gauge, 0.083 inch shank diameter.
      b. Five staples per post with at least 17 gauge, 0.0453 inch wire, 3/4 inch crown width and 1/2 inch long legs.
   9. Fasten fabric to steel posts using wire, nylon cord, or integral pockets.
   10. 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 high with post spacing not more than 4 feet.
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 in the ground.
4. Anchor bales with at least two stakes per bale, driven at least 18 inches 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.

D. Mulching Over Large Areas:
1. Dry Straw and Hay: Apply 2 1/2 tons per acre; anchor using dull disc harrow or emulsified asphalt applied using same spraying machine at 100 gallons of water per ton of mulch.
2. Wood Waste: Apply 6 to 9 tons per acre.
3. Asphalt: Apply at 1200 gallons per acre.
4. Erosion Control Matting: Comply with manufacturer's instructions.

E. Mulching Over Small and Medium Areas:
1. Dry Straw and Hay: Apply 4 to 6 inches depth.
2. Wood Waste: Apply 2 to 3inches depth.
3. Asphalt: Apply 1/4 gallon per square yard.
4. Erosion Control Matting: Comply with manufacturer's instructions.

3.05 MAINTENANCE

A. Inspect preventive measures weekly, within 24 hours after the end of any storm that produces 0.5 inches 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 01 5713

SECTION 01 6000

PRODUCT REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. General product requirements.
B. Transportation, handling, storage and protection.
C. Product option requirements.
D. Substitution limitations.
E. Maintenance materials, including extra materials, spare parts, tools, and software.

1.02 RELATED REQUIREMENTS

A. Section 01 1100 - Summary of Work: Lists of products to be removed from existing building, if applicable.
B. Section 01 4000 - Quality Requirements: Product quality monitoring.
C. 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. Product Data Submittals: Submit manufacturer's standard published data. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information specific to this Project.
B. Shop Drawing Submittals: Prepared specifically for this Project; indicate utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.
C. Sample Submittals: Illustrate functional and aesthetic characteristics of the product, with integral parts and attachment devices. Coordinate sample submittals for interfacing work.
    1. For selection from standard finishes, submit samples of the full range of the manufacturer's standard colors, textures, and patterns.

PART 2 PRODUCTS

2.01 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. Made using or containing CFC's or HCFC's.
    2. Made of wood from newly cut old growth timber.
    3. Containing lead, cadmium, or asbestos.
C. Where other criteria are met, Contractor shall give preference to products that:
    1. Are extracted, harvested, and/or manufactured closer to the location of the project.
    2. Have longer documented life span under normal use.
    3. Result in less construction waste. See Section 01 7419
D. Provide all Finish Material Products used in any individual system from the same manufacturer; no exceptions.

2.02 PRODUCT OPTIONS

A. In the case of an inconsistency between Drawings and Specifications or within either Document not clarified by addendum, provide the better quality or greater quantity of work in accordance with the Architect's interpretation.
B. Products Specified by Reference Standards or by Description Only: Use any product meeting those standards or description.
C. 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.
D. Products Specified by Naming One or More Manufacturers with a Provision for Substitutions: Submit a request for substitution for any manufacturer or product not named.
E. Manufacturers other than Basis of Design Manufacturers shall provide products or systems that meet or exceed Basis of Design products or systems. Do not issue change order solely based on bid product or system not meeting Basis of Design and being rejected through submittal process.
F. Basis-of-Design Product: Where Specifications name a product, or refer to a product indicated on Drawings, and include a list of manufacturers, provide the specified or indicated product or a comparable product by one of the other named manufacturers. Drawings and Specifications indicate sizes, profiles, dimensions, and other characteristics that are based on the product named. Comply with requirements in "Comparable Products" Article for consideration of an unnamed product by one of the other named manufacturers.

2.03 COMPARABLE PRODUCTS

A. Conditions for Consideration: Architect will consider Contractor's request for comparable product when the following conditions are satisfied. If the following conditions are not satisfied, Architect may return requests without action, except to record noncompliance with these requirements:
    1. Evidence that the proposed product does not require revisions to the Contract Documents, that it is consistent with the Contract Documents and will produce the indicated results, and that it is compatible with other portions of the Work.
    2. Detailed comparison of significant qualities of proposed product with those named in the Specifications. Significant qualities include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
    3. Evidence that proposed product provides specified warranty.
    4. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners, if requested.
    5. Samples, if requested.

2.04 MAINTENANCE MATERIALS

PART 3 EXECUTION

3.01 SUBSTITUTION PROCEDURES FOR APPROVAL PRIOR TO BIDDING

A. Architect will only consider requests for proposed substitutions made prior to 72 hours of bid time.
B. Proposed substitutions may be considered after this date when a product becomes unavailable through no fault of the Contractor.
C. Document each request with complete data substantiating compliance of proposed substitution with Contract Documents.
D. A request for substitution constitutes a representation that the submitter:

1. Has investigated proposed product and determined that it meets or exceeds the quality level of the specified product.
2. Agrees to provide the same warranty for the substitution as for the specified product.
3. 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.
4. Waives claims for additional costs or time extension that may subsequently become apparent.
5. Agrees to reimburse Owner and Architect for review or redesign services associated with re-approval by authorities.

E. Proposed substitutions will not be considered when they are indicated or implied on shop drawing or product data submittals, without separate written request, or when acceptance will require revision to the Contract Documents.

F. Proposed Substitution Submittal Procedure:
1. Submit one electonic copy of request for substitution for consideration. Limit each request to one proposed substitution.
2. Submit shop drawings, product data, and certified test results attesting to the proposed product equivalence. Burden of proof is on proposer.
3. Architect will notify Contractor in writing of decision to accept or reject request.

3.02 SUBSTITUTION LIMITATIONS

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. Provide off-site storage and protection when site does not permit on-site storage or protection.
G. Protect products from damage or deterioration due to construction operations, weather, precipitation, humidity, temperature, sunlight and ultraviolet light, dirt, dust, and other contaminants.
H. Comply with manufacturer's warranty conditions, if any.

I. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of products.
J. Store loose granular materials on solid flat surfaces in a well-drained area. Prevent mixing with foreign matter.
K. Prevent contact with material that may cause corrosion, discoloration, or staining.
L. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.
M. Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.

END OF SECTION 01 6000

SECTION 01 6116

VOLATILE ORGANIC COMPOUND (VOC) CONTENT RESTRICTIONS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. VOC restrictions for product categories listed below under "DEFINITIONS."
B. All products of each category that are installed in the project must comply; Owner's project goals do not allow for partial compliance.

1.02 RELATED REQUIREMENTS

A. Section 01 3000 - Administrative Requirements: Submittal procedures.
B. Section 01 4000 - Quality Requirements: Procedures for testing and certifications.
C. Section 01 6000 - Product Requirements: Fundamental product requirements, substitutions and product options, delivery, storage, and handling.
D. Section 01 6116.01 - Accessory Material VOC Content Certification Form.

1.03 DEFINITIONS

A. VOC-Restricted Products: All products of each of the following categories when installed or applied on-site in the building interior:
   1. Adhesives, sealants, and sealer coatings.
   2. Carpet.
   3. Carpet tile.
   4. Resilient floor coverings.
   5. Wood flooring.
   6. Paints and coatings.
   7. Insulation.
   8. Gypsum board.
   9. Acoustical ceilings and panels.
   10. Cabinet work.
   11. Wall coverings.
   12. Composite wood and agrifiber products used either alone or as part of another product.
   13. Other products when specifically stated in the specifications.
B. Interior of Building: Anywhere inside the exterior weather barrier.
C. Adhesives: All gunnable, trowelable, liquid-applied, and aerosol adhesives, whether specified or not; including flooring adhesives, resilient base adhesives, and pipe jointing adhesives.
D. Sealants: All gunnable, trowelable, and liquid-applied joint sealants and sealant primers, whether specified or not; including firestopping sealants and duct joint sealers.

1.04 REFERENCE STANDARDS

A. CAL (CHPS LEM) - Low-Emitting Materials Product List; California Collaborative for High Performance Schools (CHPS); current edition at www.chps.net/.
B. CAL (CDPH SM) - Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions From Indoor Sources Using Environmental Chambers; 2017, v1.2.
C. CRI (GLP) - Green Label Plus Testing Program - Certified Products; Current Edition.
D. GEI (SCH) - GREENGUARD "Children and Schools" Certified Products; GREENGUARD Environmental Institute; current listings at www.greenguard.org.
E. GreenSeal GS-36 - Standard for Adhesives for Commercial Use; 2013, with Editorial Revision (2024).

F. SCAQMD 1168 - Adhesive and Sealant Applications; 1989, with Amendment (2017).
G. SCS (CPD) - SCS Certified Products; Current Edition.

1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Evidence of Compliance: Submit for each different product in each applicable category.
C. Product Data: For each VOC-restricted product used in the project, submit product data showing compliance, except when another type of evidence of compliance is required.
D. Installer Certifications for Accessory Materials: Require each installer of any type of product (not just the products for which VOC restrictions are specified) to certify that either 1) no adhesives, joint sealants, paints, coatings, or composite wood or agrifiber products have been used in the installation of his products, or 2) that such products used comply with these requirements.
    1. Use the form following this section for installer certifications.

1.06 QUALITY ASSURANCE

A. Testing Agency Qualifications: Independent firm specializing in performing testing and inspections of the type specified in this section.

PART 2 PRODUCTS

2.01 MATERIALS

A. All VOC-Restricted Products: Provide products having VOC content of types and volume not greater than those specified in State of California Department of Health Services Standard Practice for the Testing of Volatile Organic Emissions From Various Sources Using Small-Scale Environmental Chambers.
    1. Evidence of Compliance: Acceptable types of evidence are:
        a. Current GREENGUARD Children & Schools certification; www.greenguard.org.
        b. Current Carpet and Rug Institute Green Label Plus certification; www.carpet-rug.org.
        c. Current SCS Floorscore certification; www.scscertified.com.
        d. Current SCS Indoor Advantage Gold certification; www.scscertified.com.
        e. Product listing in the CHPS Low-Emitting Materials Product List at www.chps.net/manual/lem_table.htm.
        f. Current certification by any other agencies acceptable to CHPS.
        g. Report of laboratory testing performed in accordance with CHPS requirements for getting a product listed in the Low-Emitting Materials Product List; report must include laboratory's statement that the product meets the specified criteria.
    2. Product data submittals showing VOC content are NOT acceptable forms of evidence.
    3. Exception: The product categories listed below are not required to comply with this requirement.
B. Adhesivesand Joint Sealants: Provide only products having volatile organic compound (VOC) content not greater than required by South Coast Air Quality Management District Rule No.1168.
    1. Evidence of Compliance: Acceptable types of evidence are:
        a. Report of laboratory testing performed in accordance with requirements.
        b. Published product data showing compliance with requirements.
        c. Certification by manufacturer that product complies with requirements.
C. Aerosol Adhesives: Provide only products having volatile organic compound (VOC) content not greater than required by GreenSeal GS-36.
    1. Evidence of Compliance: Acceptable types of evidence are:
        a. Current GreenSeal Certification.

b. Report of laboratory testing performed in accordance with GreenSeal GS-36 requirements.
c. Published product data showing compliance with requirements.

D. Paints and Coatings: Provide products having VOC content as specified in Section 09 9000.
E. Carpet and Adhesive: Provide products having VOC content not greater than that required for CRI Green Label Plus certification.
1. Evidence of Compliance: Acceptable types of evidence are:
a. Current Green Label Plus Certification.
b. Report of laboratory testing performed in accordance with requirements.
F. Carpet Tile and Adhesive: Provide products having VOC content not greater than that required for CRI Green Label Plus certification.
1. Evidence of Compliance: Acceptable types of evidence are:
a. Current Green Label Plus Certification.
b. Report of laboratory testing performed in accordance with requirements.
G. Composite Wood and Agrifiber Products and Adhesives Used for Laminating Them: Provide products having no added urea-formaldehyde resins.
1. Evidence of Compliance: Acceptable types of evidence are:
a. Current SCS "No Added Urea Formaldehyde" certification; www.scscertified.com.
b. Published product data showing compliance with requirements.
c. Certification by manufacturer that product complies with requirements.
H. Other Product Categories: Comply with limitations specified elsewhere.

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. All additional costs to restore indoor air quality due to installation of non-compliant products will be borne by Contractor.

END OF SECTION 01 6116

This page intentionally left blank

SECTION 01 6116.01

ACCESSORY MATERIAL VOC CONTENT CERTIFICATION FORM

1.01 PRODUCT CERTIFICATION

A. I certify that the installation work of my firm on this project:
   1. [HAS] [HAS NOT] required the use of any ADHESIVES.
   2. [HAS] [HAS NOT] required the use of any JOINT SEALANTS.
   3. [HAS] [HAS NOT] required the use of any PAINTS OR COATINGS.
   4. [HAS] [HAS NOT] required the use of any COMPOSITE WOOD or AGRIFIBER PRODUCTS.

B. Product data and MSDS sheets are attached.

2.01 CERTIFIED BY: (INSTALLER/MANUFACTURER/SUPPLIER FIRM)

A. Firm Name: _____
B. Print Name: _____
C. Signature: _____
D. Title: _____ (officer of company)
E. Date: _____

This page intentionally left blank

AIA® Document G704™ – 2000

Certificate of Substantial Completion

PROJECT:
(Name and address)

PROJECT NUMBER:
CONTRACT FOR: General Construction
CONTRACT DATE:

OWNER: ☐
ARCHITECT: ☐
CONTRACTOR: ☐
FIELD: ☐
OTHER: ☐

TO OWNER:
(Name and address)

TO CONTRACTOR:
(Name and address)

PROJECT OR PORTION OF THE PROJECT DESIGNATED FOR PARTIAL OCCUPANCY OR USE SHALL INCLUDE:

The Work performed under this Contract has been reviewed and found, to the Architect's best knowledge, information and belief, to be substantially complete. Substantial Completion is the stage in the progress of the Work when the Work or designated portion is sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work for its intended use. The date of Substantial Completion of the Project or portion designated above is the date of issuance established by this Certificate, which is also the date of commencement of applicable warranties required by the Contract Documents, except as stated below:

Warranty **Date of Commencement**

Naylor Wentworth Lund Architects

ARCHITECT	BY	DATE OF ISSUANCE

A list of items to be completed or corrected is attached hereto. The failure to include any items on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents. Unless otherwise agreed to in writing, the date of commencement of warranties for items on the attached list will be the date of issuance of the final Certificate of Payment or the date of final payment.

Cost estimate of Work that is incomplete or defective: $0.00

The Contractor will complete or correct the Work on the list of items attached hereto within Zero (0) days from the above date of Substantial Completion.

CONTRACTOR	BY	DATE

The Owner accepts the Work or designated portion as substantially complete and will assume full possession at (time) on (date).

OWNER	BY	DATE

The responsibilities of the Owner and Contractor for security, maintenance, heat, utilities, damage to the Work and insurance shall be as follows:
(Note: Owner's and Contractor's legal and insurance counsel should determine and review insurance requirements and coverage.)

AIA Document G704™ – 2000. Copyright © 1963, 1978, 1992 and 2000 by The American Institute of Architects. **All rights reserved.** WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law. This document was produced by AIA software at 15:16:07 on 03/14/2016 under Order No.5579111420_1 which expires on 12/19/2016, and is not for resale.
User Notes: (862146149)

This page left intentionally blank.

01 7010

AIA® Document G706™ – 1994

Contractor's Affidavit of Payment of Debts and Claims

PROJECT: *(Name and address)*

ARCHITECT'S PROJECT NUMBER:

CONTRACT FOR:

CONTRACT DATED:

TO OWNER: *(Name and address)*

OWNER ☐
ARCHITECT ☐
CONTRACTOR ☐
SURETY ☐
OTHER ☐

STATE OF:

COUNTY OF:

The undersigned hereby certifies that, except as listed below, payment has been made in full and all obligations have otherwise been satisfied for all materials and equipment furnished, for all work, labor, and services performed, and for all known indebtedness and claims against the Contractor for damages arising in any manner in connection with the performance of the Contract referenced above for which the Owner or Owner's property might in any way be held responsible or encumbered.

EXCEPTIONS:

SUPPORTING DOCUMENTS ATTACHED HERETO:

1. Consent of Surety to Final Payment. Whenever Surety is involved, Consent of Surety is required. AIA Document G707™, Consent of Surety to Final Payment, may be used for this purpose.
   Indicate attachment: ☐ Yes ☑ No

The following supporting documents should be attached hereto if required by the Owner:

1. Contractor's Release or Waiver of Liens, conditional upon receipt of final payment
2. Separate Releases or Waivers of Liens from Subcontractors and material and equipment suppliers, to the extent required by the Owner, accompanied by a list thereof
3. Contractor's Affidavit of Release of Liens (AIA Document G706A™)

CONTRACTOR: *(Name and address)*

BY:

(Signature of authorized representative)

(Printed name and title)

Subscribed and sworn to before me on this date:

Notary Public:

My Commission Expires:

CAUTION: You should sign an original AIA Contract Document, on which this text appears in RED. An original assures that changes will not be obscured.

AIA Document G706™ – 1994. Copyright © 1970 and 1994 by The American Institute of Architects**. All rights reserved. WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law.** Purchasers are permitted to reproduce ten (10) copies of this document when completed. To report copyright violations of AIA Contract Documents, e-mail The American Institute of Architects' legal counsel, copyright@aia.org.

Sample

AIA® Document G706A™ – 1994

Contractor's Affidavit of Release of Liens

PROJECT: *(Name and address)*

ARCHITECT'S PROJECT NUMBER:

CONTRACT FOR:

CONTRACT DATED:

TO OWNER: *(Name and address)*

OWNER ☐
ARCHITECT ☐
CONTRACTOR ☐
SURETY ☐
OTHER ☐

STATE OF:

COUNTY OF:

The undersigned hereby certifies that to the best of the undersigned's knowledge, information and belief, except as listed below, the Releases or Waivers of Lien attached hereto include the Contractor, all Subcontractors, all suppliers of materials and equipment, and all performers of Work, labor or services who have or may have liens or encumbrances or the right to assert liens or encumbrances against any property of the Owner arising in any manner out of the performance of the Contract referenced above.

EXCEPTIONS:

SUPPORTING DOCUMENTS ATTACHED HERETO:

1. Contractor's Release or Waiver of Liens, conditional upon receipt of final payment.
2. Separate Releases or Waivers of Liens from Subcontractors and material and equipment suppliers, to the extent required by the Owner, accompanied by a list thereof.

CONTRACTOR: *(Name and address)*

BY:

(Signature of authorized representative)

(Printed name and title)

Subscribed and sworn to before me on this date:

Notary Public:

My Commission Expires:

CAUTION: You should sign an original AIA Contract Document, on which this text appears in RED. An original assures that changes will not be obscured.

AIA Document G706A™ – 1994. Copyright © 1970 and 1994 by The American Institute of Architects**. All rights reserved. WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law.** Purchasers are permitted to reproduce ten (10) copies of this document when completed. To report copyright violations of AIA Contract Documents, e-mail The American Institute of Architects' legal counsel, copyright@aia.org.

Sample

AIA® Document G707™ – 1994

Consent of Surety to Final Payment

PROJECT: *(Name and address)*

ARCHITECT'S PROJECT NUMBER:

CONTRACT FOR:

CONTRACT DATED:

TO OWNER: *(Name and address)*

OWNER ☐
ARCHITECT ☐
CONTRACTOR ☐
SURETY ☐
OTHER ☐

In accordance with the provisions of the Contract between the Owner and the Contractor as indicated above, the
(Insert name and address of Surety)

, SURETY,

on bond of
(Insert name and address of Contractor)

, CONTRACTOR,

hereby approves of the final payment to the Contractor, and agrees that final payment to the Contractor shall not relieve the Surety of any of its obligations to
(Insert name and address of Owner)

, OWNER,

as set forth in said Surety's bond.

IN WITNESS WHEREOF, the Surety has hereunto set its hand on this date:
(Insert in writing the month followed by the numeric date and year.)

(Surety)

(Signature of authorized representative)

Attest:
(Seal)

(Printed name and title)

CAUTION: You should sign an original AIA Contract Document, on which this text appears in RED. An original assures that changes will not be obscured.

AIA Document G707™ – 1994. Copyright © 1970 and 1994 by The American Institute of Architects**. All rights reserved. WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law.** Purchasers are not permitted to reproduce this document. To report copyright violations of AIA Contract Documents, e-mail The American Institute of Architects' legal counsel, copyright@aia.org.

040511 ACD44

Sample

SECTION 01 7419

CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 GENERAL

1.01 WASTE MANAGEMENT REQUIREMENTS

A. Methods of trash/waste disposal that are not acceptable are:
   1. Burning on the project site.
   2. Burying on the project site.
   3. Dumping or burying on other property, public or private.
   4. Other illegal dumping or burying.

B. Regulatory Requirements: Contractor is responsible for knowing and complying with regulatory requirements, including but not limited to Federal, state and local requirements, pertaining to legal disposal of all construction and demolition waste materials.

1.02 DEFINITIONS

A. Clean: Untreated and unpainted; not contaminated with oils, solvents, caulk, or the like.

B. Construction and Demolition Waste: Solid wastes typically including building materials, packaging, trash, debris, and rubble resulting from construction, remodeling, repair and demolition operations.

C. Hazardous: Exhibiting the characteristics of hazardous substances, i.e., ignitibility, corrosivity, toxicity or reactivity.

D. Nonhazardous: Exhibiting none of the characteristics of hazardous substances, i.e., ignitibility, corrosivity, toxicity, or reactivity.

E. Nontoxic: Neither immediately poisonous to humans nor poisonous after a long period of exposure.

F. Recyclable: The ability of a product or material to be recovered at the end of its life cycle and remanufactured into a new product for reuse by others.

G. Recycle: To remove a waste material from the project site to another site for remanufacture into a new product for reuse by others.

H. Recycling: The process of sorting, cleansing, treating and reconstituting solid waste and other discarded materials for the purpose of using the altered form. Recycling does not include burning, incinerating, or thermally destroying waste.

I. Return: To give back reusable items or unused products to vendors for credit.

J. Reuse: To reuse a construction waste material in some manner on the project site.

K. Salvage: To remove a waste material from the project site to another site for resale or reuse by others.

L. Sediment: Soil and other debris that has been eroded and transported by storm or well production run-off water.

M. Source Separation: The act of keeping different types of waste materials separate beginning from the first time they become waste.

N. Toxic: Poisonous to humans either immediately or after a long period of exposure.

O. Trash: Any product or material unable to be reused, returned, recycled, or salvaged.

P. Waste: Extra material or material that has reached the end of its useful life in its intended use. Waste includes salvageable, returnable, recyclable, and reusable material.

PART 2 - NOT USED

PART 3 EXECUTION

3.01 WASTE MANAGEMENT

A. Hazardous Wastes: Separate, store, and dispose of hazardous wastes according to applicable regulations.
B. Reuse of Materials On-Site: Set aside, sort, and protect separated products in preparation for reuse.
C. Salvage: Set aside, sort, and protect products to be salvaged for reuse off-site.

END OF SECTION 01 7419

SECTION 01 7700

CLOSEOUT PROCEDURES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Examination, preparation, and general installation procedures.
B. Requirements for alterations work, including selective demolition, except removal, disposal, and/or remediation of hazardous materials and toxic substances.
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. General requirements for maintenance service.
J. Closeout procedures, including Contractor's Correction Punch List, except payment procedures.
K. Closeout submittals, including:
    1. Project record documents.
    2. Operation and maintenance data.
    3. Warranties, guarantees, and bonds.
        a. Form of Guarantee/Warranty follows as:
            1) Section 01 7801 - Form of Guarantee/Warranty
L. Samples for AIA documents required are included and follow this Section:
    1. AIA G704 Certificate for Substantial Completion.
    2. AIA G706 Contractor's Affidavit of Payment of Debts and Claims.
    3. AIA G706A Contractor's Affidavit of Release of Liens.
    4. AIA G707 Consent of Surety Company to Final Payment.

1.02 RELATED REQUIREMENTS

A. Section 00 7300 - Supplementary Conditions: Performance bond and labor and material payment bonds, warranty, and correction of work.
B. Section 01 1100 - Summary of Work: Limitations on working in existing building; continued occupancy; work sequence; identification of salvaged and relocated materials.
C. Section 01 3000 - Administrative Requirements: Submittals procedures, electronic document submittal service, shop drawings, product data, and samples.
D. Section 01 4000 - Quality Requirements: Testing and inspection procedures.
E. Section 01 5000 - Temporary Facilities and Controls: Temporary exterior enclosures.
F. Section 01 5000 - Temporary Facilities and Controls: Temporary interior partitions.
G. Section 01 5100 - Temporary Utilities: Temporary heating, cooling, and ventilating facilities.
H. Section 01 5713 - Temporary Erosion and Sediment Control: Additional erosion and sedimentation control requirements.
I. Section 01 7800 - Closeout Submittals: Project record documents, operation and maintenance data, guaranties, warranties and bonds.
J. Section 00 6536 - Warranty Form.
K. Section 01 7900 - Demonstration and Training: Demonstration of products and systems to be commissioned and where indicated in specific specification sections

L. Section 02 4100 - Demolition: Demolition of whole structures and parts thereof; site utility demolition.
M. Section 07 8400 - Firestopping if used.
N. Individual Product Specification Sections:
    1. Advance notification to other sections of openings required in work of those sections.
    2. Limitations on cutting structural members.
    3. Specific requirements for operation and maintenance data.
    4. Warranties/Guarantees required for specific products or Work.

1.03 REFERENCE STANDARDS

A. NFPA 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations; 2022.

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. 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. Include design drawings and calculations for bracing and shoring.
    2. Identify demolition firm and submit qualifications.
    3. Include a summary of safety procedures.
D. Cutting and Patching: Submit written request in advance of cutting or alteration that affects:
    1. Structural integrity of any element of Project.
    2. Integrity of weather exposed or moisture resistant element.
    3. Efficiency, maintenance, or safety of any operational element.
    4. Visual qualities of sight exposed elements.
    5. Work of Owner or separate Contractor.
    6. Include in request:
        a. Identification of Project.
        b. Location and description of affected work.
        c. Necessity for cutting or alteration.
        d. Description of proposed work and products to be used.
        e. Effect on work of Owner or separate Contractor.
        f. Written permission of affected separate Contractor.
        g. Date and time work will be executed.
E. Project Record Documents:
    1. Accurately record actual locations of capped and active utilities.
    2. Submit documents to Architect with claim for final Application for Payment.
F. Operation and Maintenance Data:
    1. Submit a PDF file of preliminary draft or proposed formats and outlines of contents before start of Work. Architect will review draft and return 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 a PDF file 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 hard copy sets and one set on USB storage device of revised final documents in final form within 10 days after final inspection.

G. Warranties, Guarantees, 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.

1.05 QUALIFICATIONS

A. For demolition work, employ a firm specializing in the type of work required.
1. Minimum of 3 years of documented experience.

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

C. For field engineering, employ a professional engineer of the discipline required for specific service on Project, licensed in the State in which the Project is located. Employ only individual(s) trained and experienced in establishing and maintaining horizontal and vertical control points necessary for laying out construction work on project of similar size, scope and/or complexity.

D. For design of temporary shoring and bracing, employ a Professional Engineer experienced in design of this type of work and licensed in the State in which the Project is located.

1.06 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.
1. Minimize amount of bare soil exposed at one time.
2. Provide temporary measures such as berms, dikes, and drains, to prevent water flow.
3. Construct fill and waste areas by selective placement to avoid erosive surface silts or clays.

4. Periodically inspect earthwork to detect evidence of erosion and sedimentation; promptly apply corrective measures.

G. Noise Control: Provide methods, means, and facilities to minimize noise produced by construction operations.
   1. Limit conduct of especially noisy interior/exterior work to hours approved by Murray City School District.

H. Pest and Rodent Control: Provide methods, means, and facilities to:
   1. Prevent pests and insects from damaging the work.
   2. Prevent rodents from accessing or invading premises.

I. Pollution Control: Provide methods, means, and facilities to prevent contamination of soil, water, and atmosphere from discharge of noxious, toxic substances, and pollutants produced by construction operations. Comply with federal, state, and local regulations.

1.07 COORDINATION

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 PROJECT RECORD DOCUMENTS

A. Maintain on site one set of the following record documents; record actual revisions to the Work:
   1. Drawings.
   2. Specifications.
   3. Addenda.
   4. Change Orders and other modifications to the Contract.
   5. Reviewed shop drawings, product data, and samples.
   6. Manufacturer's instruction for assembly, installation, and adjusting.

B. Ensure entries are complete and accurate, enabling future reference by Owner.
C. Store record documents separate from documents used for construction.
D. Record information concurrent with construction progress.
E. Specifications: Legibly mark and record at each product section description of actual products installed, including the following:
   1. Manufacturer's name and product model and number.
   2. Product substitutions or alternates utilized.
   3. Changes made by Addenda and modifications.

F. Record Drawings and Shop Drawings: Legibly mark each item to record actual construction including:
   1. Measured depths of foundations in relation to finish first floor datum.
   2. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
   3. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
   4. Field changes of dimension and detail.
   5. 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. Moisture protection and weather-exposed products: Include product data listing applicable reference standards, chemical composition, and details of installation. Provide recommendations for inspections, maintenance, and repair.
B. Additional information as specified in individual product specification sections.

3.04 OPERATION AND MAINTENANCE DATA FOR EQUIPMENT AND SYSTEMS

A. Panelboard Circuit Directories: Provide electrical service characteristics, controls, and communications; typed.
B. Include color coded wiring diagrams as installed.
C. Provide control diagrams by controls manufacturer as installed.
D. Provide Contractor's coordination drawings, with color coded piping diagrams as installed.
E. Provide charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.
F. Provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.
G. Include test and balancing reports.

3.05 ASSEMBLY OF OPERATION AND MAINTENANCE MANUALS

A. Binders: Commercial quality, 8 1/2 by 11 inch three D side ring binders with durable plastic covers; 3 inch maximum ring size. When multiple binders are used, correlate data into related consistent groupings.
B. Cover: Identify each binder with typed or printed title OPERATION AND MAINTENANCE INSTRUCTIONS; identify title of Project; identify subject matter of contents.
C. Dividers: Provide tabbed dividers for each separate product and system; identify the Section Number on the divider tab; immediately following the divider tab include a description of product and major component parts of equipment.
D. Drawings: Provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.

3.06 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.

3.07 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.

3.08 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.

3.09 LAYING OUT THE WORK

A. Verify locations of survey control points prior to starting work.
B. Promptly notify Architect of any discrepancies discovered.
C. Contractor shall locate and protect survey control and reference points.
D. Control datum for survey is that established by Owner provided survey.
E. Protect survey control points prior to starting site work; preserve permanent reference points during construction.
F. Promptly report to Architect the loss or destruction of any reference point or relocation required because of changes in grades or other reasons.
G. Replace dislocated survey control points based on original survey control. Make no changes without prior written notice to Architect.
H. Utilize recognized engineering survey practices.
I. Establish a minimum of two permanent bench marks on site, referenced to established control points. Record locations, with horizontal and vertical data, on project record documents.
J. Establish elevations, lines and levels. Locate and lay out by instrumentation and similar appropriate means:
    1. Site improvements including pavements; stakes for grading, fill and topsoil placement; utility locations, slopes, and invert elevations.
    2. Grid or axis for structures.
    3. Building foundation, column locations, ground floor elevations, etc.
    4. Building wall locations, door and window opening locations, etc.
    5. Assist subcontractors relative to layout and coordination of their work to successfully complete the project.
K. Construction Related Services: The Contractor will provide construction related services including construction staking, site visits, weekly construction meetings, and shop drawings review.

1. Construction staking will include the following:
    a. Stake rough grade.
    b. Blue top pads.
    c. Red top street, parking lot subgrade.
    d. Provide sewer stakes.
    e. Provide water line and fire hydrant stakes.
    f. Provide power installation stakes.
    g. Stake curb and gutter.
    h. Blue top street and parking lot finished gravel.
    i. Stake property corners.
    j. Stake finish grades at playfields and landscape areas per Civil Engineers requirements.

L. Periodically verify layouts by same means.
M. Maintain a complete and accurate log of control and survey work as it progresses.

3.10 GENERAL INSTALLATION REQUIREMENTS

A. Provide or Install means Contractor shall: Furnish all labor, materials, equipment, tools and services required to fully complete installation of specified work as is indicated on the drawings and/or specifications.
B. Install products as specified in individual sections, in accordance with manufacturer's printed instructions and recommendations, and so as to avoid waste due to necessity for replacement.
C. In addition to compliance with regulatory requirements, conduct construction operations in compliance with NFPA 241, including applicable recommendations in Appendix A.
D. Make vertical elements plumb and horizontal elements level, unless otherwise indicated.
E. Install equipment and fittings plumb and level, neatly aligned with adjacent vertical and horizontal lines, unless otherwise indicated.
F. Make consistent texture on surfaces, with seamless transitions, unless otherwise indicated.
G. Make neat transitions between different surfaces, maintaining texture and appearance.

3.11 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. Keep areas in which alterations are being conducted separated from other areas that are still occupied.
    1. Provide, erect, and maintain temporary dustproof partitions of construction specified in Section 01 5000 in locations indicated on drawings.
C. Maintain weatherproof exterior building enclosure except for interruptions required for replacement or modifications; take care to prevent water and humidity damage.
    1. Where openings in exterior enclosure exist, provide construction to make exterior enclosure weatherproof.
    2. Insulate existing ducts or pipes that are exposed to outdoor ambient temperatures by alterations work.
D. 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.

E. Services (Including but not limited to HVAC, Plumbing, Fire Protection, Electrical, and Telecommunications): 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. See Section 01 1100 for other limitations on outages and required notifications.
    c. 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.

F. 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.

G. 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 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.

H. 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.

I. 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.

J. Clean existing systems and equipment.

K. Remove demolition debris and abandoned items from alterations areas and dispose of off-site; do not burn or bury.
L. Do not begin new construction in alterations areas before demolition is complete.
M. Comply with all other applicable requirements of this section.

3.12 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. At penetrations of fire rated walls, partitions, ceiling, or floor construction, completely seal voids with fire rated material in accordance with Section 07 8400, to full thickness of the penetrated element.
J. 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.

3.13 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 weekly and dispose off-site; do not burn or bury.

3.14 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. Prohibit traffic from landscaped areas.
H. Remove protective coverings when no longer needed; reuse or recycle coverings if possible.

3.15 SYSTEM STARTUP

A. Coordinate with requirements of Individual Specification Sections.
B. Coordinate schedule for start-up of various equipment and systems.
C. Notify Architect and Owner seven days prior to start-up of each item.
D. Verify that each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, control sequence, and for conditions that may cause damage.
E. Verify tests, meter readings, and specified electrical characteristics agree with those required by the equipment or system manufacturer.
F. Verify that wiring and support components for equipment are complete and tested.
G. Execute start-up under supervision of applicable Contractor personnel and manufacturer's representative in accordance with manufacturers' instructions.
H. When specified in individual specification Sections, require manufacturer to provide authorized representative to be present at site to inspect, check, and approve equipment or system installation prior to start-up, and to supervise placing equipment or system in operation.
I. Submit a written report that equipment or system has been properly installed and is functioning correctly.

3.16 DEMONSTRATION AND INSTRUCTION

A. See Section 01 7900 - Demonstration and Training.

3.17 ADJUSTING

A. Adjust operating products and equipment to ensure smooth and unhindered operation.
B. Testing, adjusting, and balancing HVAC systems: See Division 23.

3.18 FINAL CLEANING

A. Execute final cleaning prior to final project assessment.
    1. Clean areas to be occupied by Owner prior to final completion before Owner occupancy.
B. Use cleaning materials that are nonhazardous.
C. Clean interior and exterior glass, surfaces exposed to view; remove temporary labels, stains and foreign substances, polish transparent and glossy surfaces, vacuum carpeted and soft surfaces.
D. Remove all labels that are not permanent. Do not paint or otherwise cover fire test labels or nameplates on mechanical and electrical equipment.
E. Clean equipment and fixtures to a sanitary condition with cleaning materials appropriate to the surface and material being cleaned.
F. Replace filters of operating equipment.
G. Clean debris from roofs, gutters, downspouts, scuppers, overflow drains, area drains, and drainage systems as needed
H. Clean site; sweep paved areas, rake clean landscaped surfaces.

I. Remove waste, surplus materials, trash/rubbish, and construction facilities from the site; dispose of in legal manner; do not burn or bury.

3.19 CLOSEOUT PROCEDURES

A. State Fire Marshal's Certificate of Fire Clearance:
   1. Inspections will be limited to a 70 Percent Completion Inspection and a Final Completion Inspection. However, State Fire Marshal personnel do conduct additional "construction-in-progress" inspections, and it is rare that a final inspection consists of only one visit to the project. It is most important that the Architect, Contractor, Representatives for Murray City School District and the Local Fire Department be present for the 70 Percent Completion Inspection. To this is added all appropriate subcontractors for the Final Completion Inspection.
   2. 70 Percent Completion Inspection:
      a. The State Fire Marshal's Office will check all of, but not limited to the following:
         1) Fire department access.
         2) Fire hydrant placement and operation.
         3) Fire walls (areas and/or occupancy separation; complete to the deck: penetrations, dampers, etc.)
         4) Exiting (any obstructions).
         5) Sprinkler piping, risers, stand pipes and hydrostatic tests.
         6) Certificates of underground piping tests.
         7) Door and window frames (ratings).
         8) Insulation and coverings.
         9) Wood usage in structure (non-combustible).
         10) Fireproofing and/or firestopping.
         11) Penetrations of structure (non-combustible).
         12) Impediments.
         13) Heating procedure (fuel location and piping).
         14) Welding and cutting procedures.
         15) Roofing procedures; roofing materials.
   3. Final Completion Inspection:
      a. Prior to requesting the Final Completion Inspection, the Contractor shall complete the following:
         1) Assure that the project is complete and ready for inspection.
         2) Perform a complete test of the fire alarm, fire protection, and life safety systems. Coordinate this test with the Architect and Murray City School District prior to scheduling the Final Completion Inspection. The electrical, fire alarm, and fire protection subcontractors shall be present at this test. Repeat this test until all elements of the test are acceptable. Refer to Section 01 4000 for testing requirements.
            (a) The Contractor shall perform a complete test of the fire sprinkler system noting coverage, and completeness of the riser. The fire alarm system is completely checked for operation and adequate coverage. This also includes the 24 hour battery test. Emergency lighting and exit signs as well as door operation and hardware are also checked. The mechanical systems are inspected and hood fire suppression system is also inspected and tested, including fire alarm tie-in and fuel shut-offs (if required). Inspect and text the Proscenium Fire Curtain and all special doors such as roll-up doors or horizontal folding doors. Also ensure that appropriate certificates, where applicable, have also been obtained.

3) Provide a Key Plan, showing fire alarm zones and the fire sprinkler plan, installed next to the fire alarm control panel to aid the local fire department if there is a fire in the building.

b. The State Fire Marshal's office will generate a written Final Inspection Report and send it to the Project Architect. The Certificate of Fire Clearance will only be issued after all fire and life safety items previously listed as deficient are resolved appropriately.
   1) No occupancy is permitted without the State Fire Marshal's Certificate of Fire Clearance.

B. Certificate of Substantial Completion:
   1. Pre-Substantial Completion Observation:
      a. Before requesting the Substantial Completion Observation, complete the following:
         1) Prepare a Punch List of outstanding items and deficiencies to be completed.
         2) Complete all items on the Punch List.
         3) Submit the completed Punch List to the Architect with verification that it has been completed.
         4) Provide completed Closeout Submittals as specified in Section 01 7800.
         5) Advise Murray City School District of any pending insurance change-over requirements.
         6) Deliver maintenance stock items to Murray City School District.
         7) Conduct Owner demonstration and instruction for all systems as specified in Section 01 7900.
         8) Discontinue or change over and remove temporary facilities from the site, along with construction tools, mock-ups, and similar elements as specified in Section 01 5000.
         9) Complete final clean up requirements, touch-up and otherwise repair and restore marred exposed finishes.
   2. Substantial Completion Observation:
      a. The State Fire Marshal's Office should, if acceptable, deliver to Murray City School District the Certificate of Fire Clearance. (Original to follow in the mail.)
         1) The Owner may not occupy the building until the Certificate of Fire Clearance has been signed.
      b. The Date of Occupancy must be agreed to by the appropriate Building Official who will issue the Occupancy Permit.
      c. The Architect will prepare a Punch List of items remaining to be finished.
      d. Architect's Consultants (Electrical, Mechanical, Civil, Kitchen, Landscape, etc) will prepare a Punch List of items remaining to be finished.
         1) Landscape Observation may be scheduled for a separate date.
      e. The Substantial Completion Observation requires the participation of the following:
         1) General Contractor.
         2) Electrical Contractor.
         3) Temperature Control Contractor.
         4) Fire Alarm Contractor.
         5) Fire Protection Sprinkler Contractor.
         6) Mechanical Contractor.
         7) Test and Balance Contractor (with completed test and balance report).
         8) Food Service Equipment Contractor.
         9) Elevator Contractor.
         10) Platform Curtain and Rigging Contractor.
         11) Landscape Contractor.
         12) In addition to the above participants, the following persons shall attend:

(a) School District Representative.
(b) Building Inspectors.
(c) Representative of the State Fire Marshal's Office (if required).
(d) Architect.
(e) Project Engineers and Consultants.

13) Coordinate attendance OF ALL the above listed subcontractors, and the Architect will coordinate the remainder as required.

f. Observation Procedures: On receipt of a request for this Observation, the Architect will either proceed with the same or advise the Contractor of unfulfilled requirements. The Architect will prepare the Certificate of Substantial Completion following this Observation, or advise the Contractor of work that must be completed or corrected before the certificate will be issued.
   1) The Architect will repeat the Observation only when assured that the Work has been substantially completed.
   2) Results of this Observation will form the basis of requirements for final acceptance.

g. When the Substantial Completion Certificate is awarded, be prepared to obtain and submit releases enabling the Owner unrestricted use of the Work and access to services and utilities.
   1) AIA Document G706, Contractor's Affidavit of Payment of Debts and Claims.
   2) AIA Document G706A, Contractor's Affidavit of Release of Liens.
   3) AIA Document G707, Consent of Surety Company to Final Payment.

C. Final Acceptance Observation:
   1. Before requesting Final Acceptance Observation for certification of final acceptance and final payment, complete the following:
      a. Submit the final payment request and supporting documentation not previously submitted and accepted. Include certificates of insurance for products and completed operations where required.
      b. Submit an updated final statement accounting for final additional changes to the Contract Sum.
      c. Submit a certified copy of the Architect's final observation list of items to be completed or corrected, stating that each item has been completed or otherwise resolved for acceptance.
      d. Submit AIA Document G707 Consent of Surety Company to Final Payment.
      e. Submit a final liquidated damages settlement statement.
      f. Submit evidence of final, continuing insurance coverage complying with insurance requirements.
   2. Re-Observation Procedure: The Architect will re-observe the Work upon receipt of notice that the Work, including observation list items from earlier observations, has been completed, except items whose completion has been delayed because of circumstances acceptable to the Architect.
      a. Upon completion of this observation, the Architect will advise the Contractor the project is acceptable and to proceed with final project closeout as listed above, or advise the Contractor of Work that is incomplete or of obligations that have not been fulfilled but are required for final acceptance.
      b. If necessary, the Architect will conduct additional re-observations as required to obtain final acceptance. Each subsequent re-observation will be back charged against the project Contract for the Architect's, Engineer's, and Owner's time.

D. Proposed Time Schedule:

1. The Architect is suggesting the following dates for Project Closeout. These dates are to be considered latest possible dates to meet the Owner's requirements. Earlier dates are preferred.
    a. Date to be announced - Fire Marshal 70% Inspection
    b. Date to be announced - Substantial Completion Observation and Fire Marshal Observation.
    c. Date to be announced - Final Acceptance Observation.

E. Make submittals that are required by governing or other authorities.
    1. Provide copies to Architect and Owner.

F. Accompany Project Coordinator on preliminary inspection to determine items to be listed for completion or correction in the Contractor's Correction Punch List for Contractor's Notice of Substantial Completion.

G. 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.

H. Conduct Substantial Completion inspection and create Final Correction Punch List containing Architect's and Contractor's comprehensive list of items identified to be completed or corrected and submit to Architect.

I. Correct items of work listed in Final Correction Punch List and comply with requirements for access to Owner-occupied areas.

END OF SECTION 01 7700

SECTION 01 7800

CLOSEOUT SUBMITTALS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Project record documents.
B. Operation and maintenance data.
C. Warranties, guarantees, and bonds.
    1. Form of Guarantee/Warranty follows as:
        a. Section 01 7801 - Form of Guarantee/Warranty

1.02 RELATED REQUIREMENTS

A. Section 00 7300 - Supplementary Conditions: Performance bond and labor and material payment bonds, warranty, and correction of work.
B. Section 01 3000 - Administrative Requirements: Submittals procedures, shop drawings, product data, and samples.
C. Section 01 7700 - Closeout Procedures: Contract closeout procedures.
D. Section 00 6536 - Warranty Form
E. Individual Product Sections: Specific requirements for operation and maintenance data.
F. Individual Product Sections: Warranties/Guarantees 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 a PDF file of preliminary draft or proposed formats and outlines of contents before start of Work. Architect will review draft and return 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 a PDF file 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 hard copy sets and one set on USB storage device of revised final documents in final form within 10 days after final inspection.
C. Warranties, Guarantees, and Bonds:
    1. For equipment or component parts of equipment put into service during construction with Owner's permission, submit documents within 10 days after acceptance.
    2. Make other submittals within 10 days after Date of Substantial Completion, prior to final Application for Payment.
    3. For items of Work for which acceptance is delayed beyond Date of Substantial Completion, submit within 10 days after acceptance, listing the date of acceptance as the beginning of the warranty period.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 PROJECT RECORD DOCUMENTS

A. Maintain on site one set of the following record documents; record actual revisions to the Work:

1. Drawings.
2. Specifications.
3. Addenda.
4. Change Orders and other modifications to the Contract.
5. Reviewed shop drawings, product data, and samples.
6. Manufacturer's instruction for assembly, installation, and adjusting.

B. Ensure entries are complete and accurate, enabling future reference by Owner.
C. Store record documents separate from documents used for construction.
D. Record information concurrent with construction progress.
E. Specifications: Legibly mark and record at each product section description of actual products installed, including the following:
   1. Manufacturer's name and product model and number.
   2. Product substitutions or alternates utilized.
   3. Changes made by Addenda and modifications.
F. Record Drawings and Shop Drawings: Legibly mark each item to record actual construction including:
   1. Measured depths of foundations in relation to finish first floor datum.
   2. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
   3. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
   4. Field changes of dimension and detail.
   5. Details not on original Contract drawings.

3.02 OPERATION AND MAINTENANCE DATA

A. Source Data: For each product or system, list names, addresses and telephone numbers of Subcontractors and suppliers, including local source of supplies and replacement parts.
B. Product Data: Mark each sheet to clearly identify specific products and component parts, and data applicable to installation. Delete inapplicable information.
C. Drawings: Supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams. Do not use Project Record Documents as maintenance drawings.
D. Typed Text: As required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions.

3.03 OPERATION AND MAINTENANCE DATA FOR MATERIALS AND FINISHES

A. For each product, applied material, and finish:
   1. Product data, with catalog number, size, composition, and color and texture designations.
   2. Information for re-ordering custom manufactured products.
B. Instructions for Care and Maintenance: Manufacturer's recommendations for cleaning agents and methods, precautions against detrimental cleaning agents and methods, and recommended schedule for cleaning and maintenance.
C. Moisture protection and weather-exposed products: Include product data listing applicable reference standards, chemical composition, and details of installation. Provide recommendations for inspections, maintenance, and repair.
D. Additional information as specified in individual product specification sections.
E. Where additional instructions are required, beyond the manufacturer's standard printed instructions, have instructions prepared by personnel experienced in the operation and maintenance of the specific products.

3.04 OPERATION AND MAINTENANCE DATA FOR EQUIPMENT AND SYSTEMS

A. For Each Item of Equipment and Each System:
   1. Description of unit or system, and component parts.
   2. Identify function, normal operating characteristics, and limiting conditions.
   3. Include performance curves, with engineering data and tests.
   4. Complete nomenclature and model number of replaceable parts.

B. Where additional instructions are required, beyond the manufacturer's standard printed instructions, have instructions prepared by personnel experienced in the operation and maintenance of the specific products.

C. Panelboard Circuit Directories: Provide electrical service characteristics, controls, and communications; typed.

D. Include color coded wiring diagrams as installed.

E. Operating Procedures: Include start-up, break-in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shut-down, and emergency instructions. Include summer, winter, and any special operating instructions.

F. Maintenance Requirements: Include routine procedures and guide for preventative maintenance and trouble shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.

G. Provide servicing and lubrication schedule, and list of lubricants required.

H. Include manufacturer's printed operation and maintenance instructions.

I. Include sequence of operation by controls manufacturer.

J. Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.

K. Provide control diagrams by controls manufacturer as installed.

L. Provide Contractor's coordination drawings, with color coded piping diagrams as installed.

M. Provide charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.

N. Provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.

O. Include test and balancing reports.

P. Additional Requirements: As specified in individual product specification sections.

3.05 ASSEMBLY OF OPERATION AND MAINTENANCE MANUALS

A. Assemble operation and maintenance data into durable manuals for Owner's personnel use, with data arranged in the same sequence as, and identified by, the specification sections.

B. Where systems involve more than one specification section, provide separate tabbed divider for each system.

C. Binders: Commercial quality, 8 1/2 by 11 inch three D side ring binders with durable plastic covers; 3 inch maximum ring size. When multiple binders are used, correlate data into related consistent groupings.

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

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

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.
   1. Tabs to organized by Section Number.

G. Dividers: Provide tabbed dividers for each separate product and system; identify the Section Number 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 24 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, GUARANTEES, AND BONDS

A. Each Subcontractor to submit form found in Section 00 6536 - Warranty Form
B. Minimum Guarantee/Warranty period to be One (1) unless otherwise stated in Sections.
C. Obtain warranties, guarantees, and bonds, executed in duplicate by responsible Subcontractors, suppliers, and manufacturers, within 10 days after completion of the applicable item of work. Except for items put into use with Owner's permission, leave date of beginning of time of warranty until the Date of Substantial completion is determined.
D. Verify that documents are in proper form, contain full information, and are notarized.
E. Co-execute submittals when required.
F. Retain warranties and bonds until time specified for submittal.
G. Include originals of each in operation and maintenance manuals, indexed separately on Table of Contents.
H. Manual: Bind in commercial quality 8 1/2 by 11 inch three D side ring binders with durable plastic covers.
I. Cover: Identify each binder with typed or printed title WARRANTIES, GUARANTEES, AND BONDS, with title of Project; name, address and telephone number of Contractor and equipment supplier; and name of responsible company principal.
J. 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.
K. Separate each warranty, guarantee, 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 01 7800

SECTION 01 7801
FORM OF GUARANTEE/WARRANTY

PROJECT INFORMATION

Project Name: Riverview Junior High School Replacement - BP 03.
Project Address: 751 West Tripp Lane, Murray, Utah 84123
Owner: Murray City School District.
Owner's Address: 5102 S Commerce Drive Murray, Utah 84107

CONTRACTOR

Contractor Name: _____
Contractor's Address: _____
_____

GUARANTEE/WARRANTY

Date: _____

Know all persons by these presents that, in consideration of my (our) having been awarded the Contract for complete furnishing and installation of: (List specific sections and extent of work.)

_____
_____
_____

In conformity with the drawings and specifications prepared by Naylor Wentworth Lund Architects, 723 West Pacific Ave, Salt Lake City, Utah 84104.

We do hereby agree to return to the project with three (3) working days upon notification by the Owner that materials and/or workmanship has proven faulty and to repair, replace or otherwise make good to the full satisfaction of the Owner and/or Architect all such work (including adjacent work disturbed in completing required work under this warranty) without cost to the Owner.

This agreement shall remain in full force and effect until _____year(s) from date of Substantial Completion established for the project by the Architect on the Certificate of Substantial Completion.

_____ Authorized Signature
_____ Title
_____ Contractor

This page intentionally left blank

SECTION 01 7900

DEMONSTRATION AND TRAINING

PART 1 GENERAL

1.01 SUMMARY

A. Demonstration of products and systems where indicated in specific specification sections.
B. Training of Owner personnel in operation and maintenance is required for:
   1. All software-operated systems.
   2. HVAC systems and equipment.
   3. Plumbing equipment.
   4. Electrical systems and equipment.
   5. Conveying systems.
   6. Landscape irrigation.
   7. Food service equipment.
   8. Door hardware.
   9. Items specified in individual product Sections.
C. Training of Owner personnel in care, cleaning, maintenance, and repair is required for:
   1. Roofing, waterproofing, and other weather-exposed or moisture protection products.
   2. Finishes, including flooring, wall finishes, ceiling finishes.
   3. Fixtures and fittings.
   4. Items specified in individual product Sections.

1.02 RELATED REQUIREMENTS

A. Section 01 7800 - Closeout Submittals: Operation and maintenance manuals.
B. Other Specification Sections: Additional requirements for demonstration and training.

1.03 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Training Plan: Owner will designate personnel to be trained; tailor training to needs and skill-level of attendees.
   1. Submit to Architect for transmittal to Owner.
   2. Submit not less than four weeks prior to start of training.
   3. Revise and resubmit until acceptable.
   4. Provide an overall schedule showing all training sessions.
   5. Include at least the following for each training session:
      a. Identification, date, time, and duration.
      b. Description of products and/or systems to be covered.
      c. Name of firm and person conducting training; include qualifications.
      d. Intended audience, such as job description.
      e. Objectives of training and suggested methods of ensuring adequate training.
      f. Methods to be used, such as classroom lecture, live demonstrations, hands-on, etc.
      g. Media to be used, such a slides, hand-outs, etc.
      h. Training equipment required, such as projector, projection screen, etc., to be provided by Contractor.
C. Training Manuals: Provide training manual for each attendee; allow for minimum of two attendees per training session.
   1. Include applicable portion of O&M manuals.

2. Include copies of all hand-outs, slides, overheads, video presentations, etc., that are not included in O&M manuals.
3. Provide one extra copy of each training manual to be included with operation and maintenance data.

D. Training Reports:
1. Identification of each training session, date, time, and duration.
2. Sign-in sheet showing names and job titles of attendees.
3. List of attendee questions and written answers given, including copies of and references to supporting documentation required for clarification; include answers to questions that could not be answered in original training session.

E. Video Recordings: Submit digital video recording of each training session for Owner's subsequent use.
1. Format: DVD Disc.
2. Label each disc and container with session identification and date.

1.04 QUALITY ASSURANCE

A. Instructor Qualifications: Familiar with design, operation, maintenance and troubleshooting of the relevant products and systems.
1. Provide as instructors the most qualified trainer of those contractors and/or installers who actually supplied and installed the systems and equipment.
2. Where a single person is not familiar with all aspects, provide specialists with necessary qualifications.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 DEMONSTRATION - GENERAL

A. Demonstrations conducted during system start-up do not qualify as demonstrations for the purposes of this section, unless approved in advance by Owner.
B. Demonstration may be combined with Owner personnel training if applicable.
C. Operating Equipment and Systems: Demonstrate operation in all modes, including start-up, shut-down, seasonal changeover, emergency conditions, and troubleshooting, and maintenance procedures, including scheduled and preventive maintenance.
1. Perform demonstrations not less than two weeks prior to Substantial Completion.
2. For equipment or systems requiring seasonal operation, perform demonstration for other season within six months.

D. Non-Operating Products: Demonstrate cleaning, scheduled and preventive maintenance, and repair procedures.
1. Perform demonstrations not less than two weeks prior to Substantial Completion.

3.02 TRAINING - GENERAL

A. Conduct training on-site unless otherwise indicated.
B. Owner will provide classroom and seating at no cost to Contractor.
C. Provide training in minimum two hour segments.
D. Training schedule will be subject to availability of Owner's personnel to be trained; re-schedule training sessions as required by Owner; once schedule has been approved by Owner failure to conduct sessions according to schedule will be cause for Owner to charge Contractor for personnel "show-up" time.
E. Review of Facility Policy on Operation and Maintenance Data: During training discuss:

1. The location of the O&M manuals and procedures for use and preservation; backup copies.
2. Typical contents and organization of all manuals, including explanatory information, system narratives, and product specific information.
3. Typical uses of the O&M manuals.

F. Product- and System-Specific Training:
1. Review the applicable O&M manuals.
2. For systems, provide an overview of system operation, design parameters and constraints, and operational strategies.
3. Review instructions for proper operation in all modes, including start-up, shut-down, seasonal changeover and emergency procedures, and for maintenance, including preventative maintenance.
4. Provide hands-on training on all operational modes possible and preventive maintenance.
5. Emphasize safe and proper operating requirements; discuss relevant health and safety issues and emergency procedures.
6. Discuss common troubleshooting problems and solutions.
7. Discuss any peculiarities of equipment installation or operation.
8. Discuss warranties and guarantees, including procedures necessary to avoid voiding coverage.
9. Review recommended tools and spare parts inventory suggestions of manufacturers.
10. Review spare parts and tools required to be furnished by Contractor.
11. Review spare parts suppliers and sources and procurement procedures.

G. Be prepared to answer questions raised by training attendees; if unable to answer during training session, provide written response within three days.

END OF SECTION 01 7900

This page intentionally left blank

SECTION 02 4100

DEMOLITION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Furnish all labor, materials, equipment, tools and services required to fully complete all Demolition work as indicated on the drawings and/or specified herein including, but not limited to, the following described items.
B. Complete Building and structure demolition excluding removal of hazardous materials and toxic substances. Refer to drawings for a list of owner-salvaged items.
C. Selective Site Demolition:
    1. Refer to drawings for extent of work
    2. Demolition of designated site improvements including paving, curbing, site walls, and utility structures.
    3. Demolition of below-grade foundations and site improvements complete to avoid conflict with new construction or site work.
    4. Removal of hollow items or items which could collapse.
    5. Salvage of designated items.
    6. Protection of site work and adjacent structures.
    7. Disconnection, capping, and removal of utilities.
    8. Pollution control during building demolition, including noise control.
    9. Designated site improvements and adjacent construction.
    10. Interruption, capping or removal of utilities as applicable.
    11. Removal of CMU walls and footings, fences, fence posts, mail box posts, and miscellany.
    12. Removal of trees, stumps, roots, and tree debris.
    13. Clearing site of plant life, root systems and shrubs.
    14. Selective demolition of built site elements.
    15. Demolition of existing buildings
    16. Removal and legal disposal of materials.
D. Hazardous Materials:
    1. Not present.
    2. Removed under separate prior contract.
    3. Hazard materials not anticipated.
        a. If hazardous materials are discovered during removal operations, stop work and notify Architect and Owner; hazardous materials include regulated asbestos, or materials containing lead, PCB's, and mercury.
E. Do not include sales tax, refer to 00 1115 - Advertisement for Prequalification of Bidders.

1.02 RELATED REQUIREMENTS

A. Section 01 1100 - Summary of Work: Limitations on Contractor's use of site and premises.
B. Section 01 5000 - Temporary Facilities and Controls: Site fences, security, protective barriers, and waste removal.
C. Section 01 5713 - Temporary Erosion and Sediment Control.
D. Section 01 6000 - Product Requirements: Handling and storage of items removed for salvage and relocation.
E. Section 01 7700 - Closeout Procedures: Project conditions; protection of bench marks, survey control points, and existing construction to remain; reinstallation of removed products; temporary bracing and shoring.

F. Section 01 7419 - Construction Waste Management and Disposal: Limitations on disposal of removed materials; requirements for recycling.

1.03 REFERENCE STANDARDS

A. 29 CFR 1926 - Safety and Health Regulations for Construction; Current Edition.
B. NFPA 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations; 2022.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. 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.
C. Project Record Documents: Accurately record actual locations of capped and active utilities and subsurface construction.

1.05 QUALITY ASSURANCE

A. Pre-demolition Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination." Review methods and procedures related to selective demolition including, but not limited to, the following:
   1. Convene minimum two weeks prior to starting work of this section.
   2. Inspect and discuss condition of construction to be demolished.
   3. Review structural load limitations of existing structure.
   4. Review and finalize demolition schedule and verify availability of materials, demolition personnel, equipment, and facilities needed to make progress and avoid delays.
   5. Review requirements of work performed by other trades that rely on substrates exposed by selective demolition operations.
   6. Review areas where existing construction is to remain and requires protection.
   7. Review shoring plans and methods of shoring placement.
B. Demolition Firm Qualifications: Company specializing in the type of work required.
   1. Minimum of 5 years of documented experience.

1.06 SEQUENCING

A. No responsibility for buildings and structures to be demolished will be assumed by the Owner.

PART 2 PRODUCTS -- NOT USED

PART 3 EXECUTION

3.01 SCOPE

A. Refer to Drawing for extent of work

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. Comply with applicable requirements of NFPA 241.
   3. Use of explosives is not permitted.

4. Take precautions to prevent catastrophic or uncontrolled collapse of structures to be removed; do not allow worker or public access within range of potential collapse of unstable structures.
5. Provide, erect, and maintain temporary barriers and security devices.
6. Use physical barriers to prevent access to areas that could be hazardous to workers or the public.
7. Conduct operations to minimize effects on and interference with adjacent structures and occupants.
8. Do not close or obstruct roadways or sidewalks without permit.
9. Conduct operations to minimize obstruction of public and private entrances and exits; do not obstruct required exits at any time; protect persons using entrances and exits from removal operations.
10. Obtain written permission from owners of adjacent properties when demolition equipment will traverse, infringe upon or limit access to their property.

B. Do not begin removal until receipt of notification to proceed from Owner.
C. 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.
D. If hazardous materials are discovered during removal operations, stop work and notify Architect and Owner; hazardous materials include regulated asbestos, or materials containing lead, PCB's, and mercury.
E. Perform demolition in a manner that maximizes salvage and recycling of materials.
   1. Dismantle existing construction and separate materials.
   2. Set aside reusable, recyclable, and salvageable materials; store and deliver to collection point or point of reuse.

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. 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.
E. Remove exposed piping, valves, meters, equipment, supports, and foundations of disconnected and abandoned utilities.
F. 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 DEMOLITION

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 demolition work constitutes acceptance of existing conditions that would be apparent upon examination prior to starting demolition.
B. Buildings and appurtenances shall be removed complete and include:
   1. Basement and/or tunnels shall be removed complete and all debris remaining shall be removed from the voids prior to backfilling.
   2. Prior to beginning backfill operations, subgrade shall be treated and compacted as described in Fill specification

3. Basements, tunnels or other open voids shall be filled with suitable material and compacted as described in Fill specification

3.05 DEBRIS AND WASTE REMOVAL

A. Remove debris, junk, and trash from site.
B. Remove from site all materials not to be reused on site; comply with requirements of Section 01 7419 - Waste Management.
C. Leave site in clean condition, ready for subsequent work.
D. Clean up spillage and wind-blown debris from public and private lands.

END OF SECTION 02 4100

SECTION 03 1000

CONCRETE FORMING AND ACCESSORIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Furnish all labor, materials, equipment, tools and services required to fully complete all Concrete Forming work as required by the Drawings and/or specified herein including, but not limited to, the following described items.
B. Formwork for cast-in-place building concrete, with shoring, bracing and anchorage.
   1. Architectural-grade finishes for all exposed walls.
C. Openings for other work.
D. Form liner.
E. Form accessories.
F. Expanded polystyrene (EPS) geofoam void filler.
G. Form stripping.
H. Do not include sales tax, refer to 00 1115 - Advertisement for Prequalification of Bidders.

1.02 RELATED REQUIREMENTS

A. Section 03 2000 - Reinforcing.
B. Section 03 3000 - Cast-in-Place Concrete.
C. Section 03 4713 - Tilt-Up Concrete.
D. Section 04 2731 - Engineered Unit Masonry: Reinforcement for engineered masonry.
E. Section 05 1200 - Structural Steel Framing: Placement of embedded steel anchors and plates in cast-in-place concrete.
F. Section 05 2100 - Steel Joist Framing: Placement of embedded steel anchors, plates and joist seats in cast-in-place concrete.
G. Section 05 3100 - Steel Decking: Placement of steel anchors in composite decking.
H. Section 31 2316 - Excavation: Shoring and underpinning for excavation.

1.03 REFERENCE STANDARDS

A. ACI 117 - Specification for Tolerances for Concrete Construction and Materials; 2010 (Reapproved 2015).
B. ACI 301 - Specifications for Concrete Construction; 2020.
C. ACI 318 - Building Code Requirements for Structural Concrete; 2019, with Errata (2021).
D. ACI 347R - Guide to Formwork for Concrete; 2014, with Errata (2017).
E. ASTM C1184 - Standard Specification for Structural Silicone Sealants; 2018, with Editorial Revision.
F. ASTM C578 - Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation; 2019.
G. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2018.
H. ASTM D6817/D6817M - Standard Specification for Rigid Cellular Polystyrene Geofoam; 2017 (Reapproved 2021).
I. ICC-ES AC239 - Acceptance Criteria for Termite-Resistant Foam Plastic; 2008, with Editorial Revision (2014).
J. PS 1 - Structural Plywood; 2009 (Revised 2019).

1.04 SUBMITTALS

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

B. Product Data: Provide data on form and void filler materials, form release compounds, form ties and installation requirements.
C. Shop Drawings: Submit formwork and shoring shop drawings. Indicate the following:
    1. Indicate pertinent dimensions, materials, bracing, and arrangement of joints and ties.
    2. Pertinent dimensions, openings, methods of construction, types of connections, materials, joint arrangement and details, ties and shores, location of framing, studding and bracing, and temporary supports.
    3. Means of leakage prevention for concrete exposed to view in finished construction.
    4. Sequence and timing of erection and stripping, assumed compressive strength at time of stripping, height of lift and height of drop during placement.
    5. Vertical, horizontal, and special loads in accordance with ACI 347, Section 2.2 and camber diagrams, when applicable.
    6. Notes to formwork Erector showing size and location of conduits and piping embedded in concrete in accordance with ACI 318, Section 6.3.
    7. EPS Geofoam void filler block layout.
D. Design Data: As required by authorities having jurisdiction.
    1. Pertinent dimensions, openings, methods of construction, types of connections, materials, joint arrangement and details, ties and shores, location of framing, studding and bracing, and temporary supports.
    2. Means of leakage prevention for concrete exposed to view in finished construction.
    3. Sequence and timing of erection and stripping, assumed compressive strength at time of stripping, height of lift and height of drop during placement.
    4. Vertical, horizontal, and special loads in accordance with ACI 347, Section 2.2 and camber diagrams, when applicable.
    5. Notes to formwork Erector showing size and location of conduits and piping embedded in concrete in accordance with ACI 318, Section 6.3.
    6. EPS Geofoam void filler block layout.

1.05 QUALITY ASSURANCE

A. Designer Qualifications: Design formwork under direct supervision of a Professional Structural Engineer experienced in design of concrete formwork and licensed in the State in which the Project is located.
B. Maintain one copy of each installation standard on site throughout the duration of concrete work.

1.06 MOCK-UP

A. Locate mock-up where directed.
B. Mock-up may remain as part of the Work.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Store all form materials and accessories above ground on framework or blocking. Cover form materials with a suitable waterproof covering that provides adequate air circulation and ventilation.
B. Handling: Lift form panels by methods that will protect panels from damage and distortion.
C. Deliver EPS Geofoam void filler labeled with material type. Store above ground and protected from moisture and sunlight prior to installation. Product should not be exposed to open flame or other ignition sources.

PART 2 PRODUCTS

2.01 FORMWORK - GENERAL

A. Formwork Standards: Unless otherwise indicated, design, construct, erect, maintain, and remove forms and related structures for concrete work in accordance with applicable requirements of ACI 301, ACI 318, and ACI 347.
   1. Architectural Concrete: Ensure that forms for architectural concrete are designed and constructed in accordance with ACI 301.
   2. Deflection: Where dead and live loads on forms will be more than 20 percent greater than the weight of the concrete, provide framing lumber of required strength, and comply with ACI 301 and ACI 347 for design of framing members. Keep deflection within the specified tolerances herein.
   3. Concrete Mix Design: Coordinate design of formwork with the concrete mix design as specified in Section 03 3000 - Cast-In-Place Concrete so that form materials, form surfaces, and formwork strength will produce the desired concrete tolerances and finishes.

B. Formwork Surface Materials: Provide material and work quality which will produce clean, smooth, and uniform finished surfaces within the allowable tolerances specified and which will conform with the following requirements:
   1. Concrete Exposed to View: Provide material and work quality that will produce clean, smooth, and uniform concrete surfaces. Transfer of wood grain to concrete is not acceptable. Refer to Section 03 3000 - Cast-In-Place Concrete and ACI 301 for requirements.
   2. Concrete Concealed from View: Provide material and work quality that will produce aligned concrete surfaces free of fins, honeycomb, and stains.

C. Special Formwork Sections: Provide openings, offsets, sinkages, keyways, recessed, moldings, rustication strips, chamfers, blocking, screeds, bulkheads, anchorages, embedded items, and other features. Select materials and provide workmanship that will ensure indicated finishes.

D. Provide concrete forms, accessories, shoring, and bracing as required to accomplish cast-in-place concrete work.

E. Design and construct concrete that complies with design with respect to shape, lines, and dimensions.

F. Chamfered Corners: Ensure that all outside corners of beams, joists, columns, and walls are chamfered unless otherwise indicated.

G. Comply with applicable state and local codes with respect to design, fabrication, erection, and removal of formwork.

H. Comply with relevant portions of ACI 301, ACI 318, ACI 347R, ACI 301, ACI 318, ACI 347R, ACI 301, ACI 318, and ACI 347R.

I. Removal Features: Design formwork to be readily removable without impact, shock, and damage to concrete surfaces and adjacent materials.

J. Tolerances for Formed Surfaces: For buildings and similar structures, comply with the requirements of ACI 301, as applicable. For those items of work or parts of the structure not covered by ACI 301, comply with the requirements of ACI 117, as applicable. Coordinate with the requirements specified in Section 03 3000 - Cast-In-Place Concrete.

2.02 WOOD FORM MATERIALS

A. Softwood Plywood Forms: Ensure that plywood is graded and grade-marked in accordance with U.S. Product Standard PS 1.
   1. B-B Plyform: Provide Class I, EXT-APA, sanded, APA trademarked.
   2. B-C Plyform: Provide Class I, EXT-APA, APA trademarked.

3. High Density Overlay (HDO) Plyform: Provide A-A, 60-60, Class I, EXT-APA, APA trade marked.
4. Thickness: As required to maintain surface smoothness without deflection, but no thinner than 5/8 inch (16 mm).

B. Lumber Forms: Douglas Fir species; No. 2 grade; with grade stamp clearly visible.
1. Boards: Use dressed side of lumber for surface in contact with the concrete, and provide boards with shiplapped or tongue and groove edges to prevent mortar leakage.

C. Framing, Studding and Bracing Lumber: Stud or No. 2 structural light framing grade.

2.03 REMOVABLE PREFABRICATED FORMS

A. Manufacturers:
1. Symons - Dayton Superior Corporation: www.symons.com.
2. Advance Concrete Form, Inc: www.advanceconcreteform.com.
3. EFCO Corporation: www.efcoforms.com.
4. Western Forms: www.westernforms.com.

B. Preformed Steel Forms: Fabricated steel forms, using standard or commercial quality, uncoated steel sheet or plate, 3/16 inch (5 mm) minimum thickness, for panel facings. Provide surfaces that will not impart corrosion residue to concrete. Include panel framing, reinforcement, and erection accessories.

C. Form Liner: Tight-fitting, stiffened to support weight of concrete without deflection detrimental to tolerances and appearance of finished surfaces. Refer to drawing for limited locations.
1. Pattern: As noted in Drawings.

2.04 FORMWORK ACCESSORIES

A. Leakage Control Materials: Provide materials capable of producing flush, watertight, and non-absorbent surfaces and joints, and compatible with forming material and concrete ingredients. Seal form edges with gasketing material or sealant placed in the joint in such a way that neither a fin nor groove is made in the face of the cast concrete.
1. Caulking Compound: Silicone or polyurethane construction sealant conforming to ASTM C1184 or ASTM C920, as applicable.
2. Tapes: Form film tape of polypropylene plastic treated with waterproof adhesive, for joint conditions not exposed to view.

B. Form Release Agent: Commercial formulation, designed for use on all types of forms, capable of releasing forms from hardened concrete without staining or discoloring concrete or forming bugholes and other surface defects, and not requiring removal for satisfactory bonding of coatings to be applied.

C. Form Ties: Rod type, with ends of end fasteners which can be removed without spalling the concrete and which leave a hole equal in depth to the required reinforcement clearance. Ensure that form ties are of a design in which the hole left by the removed end or end fastener is easily filled to match the surface of the hardened concrete. Provide removable cones 1 1/4 inches (32 mm) in diameter by 1 1/2 inches (38 mm) deep. Provide preformed mortar plugs to match the color of the concrete, recessed 1/4 inch (6 mm), adhered with an approved epoxy adhesive.

D. Inserts: Cast stainless steel or welded stainless steel, Type 316 or similar 300 Series, complete with anchors to concrete and fittings such as bolts, wedges, and straps. Provide hanger inserts where detailed.

E. Filler Strips for Chamfered Corners: Rigid plastic or wood strip type; 3/4 x 3/4 inch size; maximum possible lengths.

F. Dovetail Anchor Slot: Galvanized steel, at least 22 gauge, 0.0299 inch thick, foam filled, release tape sealed slots, anchors for securing to concrete formwork.

G. Flashing Reglets: Galvanized steel, at least 22 gauge, 0.0299 inch thick, longest possible lengths, with alignment splines for joints, foam filled, release tape sealed slots, anchors for securing to concrete formwork.
H. Vapor Retarder: As specified in Section 03 3000.
I. Nails, Spikes, Lag Bolts, Through Bolts, Anchorages: Sized as required, of sufficient strength and character to maintain formwork in place while placing concrete.
J. Embedded Anchor Shapes, Plates, Angles and Bars: As specified in Section 05 1200.
K. Waterstops: As specified in Section 03 3000.
L. Joint Filler: As specified in Section 32 1313.

2.05 EPS GEOFOAM VOID FILLER

A. Manufacturers:
   1. ACH Foam Technologies, LLC: www.achfoam.com.
   2. Big Sky Insulations, Inc: www.bigskyrcontrol.com.
   3. Insulfoam: www.insulfoam.com.
   4. Substitutions: See Section 01 6000 - Product requirements.
B. EPS Geofoam: Expanded polystyrene (EPS) geofoam void filler in accordance withASTM D6817/D6817M
   1. Type: EPS19 - 320 PSF - 1.15 LB/FT³.
   2. Use modified raw materials containing a flame retardant.
   3. Ensure that all Geofoam blocks are treated by the manufacturer with a tested and proven termite treatment for below grade applications and who has a minimum of three years' field exposure. Ensure that the treatment is EPA registered, meets requirements of ICC-ES AC239, and is recognized in an ICC ES report.
C. Gripper Plates: Galvanized or stainless steel with two-sided multi-barbed design capable of piercing geofoam. Ensure that each plate is capable of a lateral holding strength of 60 lbs.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify lines, levels and centers before proceeding with formwork. Ensure that dimensions agree with drawings.

3.02 EARTH FORMS

A. Earth work forms shall not be used, unless specifically detailed by structural engineer.

3.03 ERECTION - FORMWORK

A. Erect formwork, shoring and bracing to achieve design requirements, in accordance with requirements of ACI 301 and approved Shop Drawings, and in a manner that will produce finished concrete surfaces conforming to indicated design and within specified tolerances.
B. Provide bracing to ensure stability of formwork. Shore or strengthen formwork subject to overstressing by construction loads. Support joints with extra studs or girts, and in a manner that will ensure true, square intersections.
C. Brace temporary closures to prevent warpage or displacement and set tightly against forms in a manner that will prevent loss of concrete mortar.
D. Kerf wood inserts for forming keyways, reglets, and recesses in a manner that will prevent swelling and ensure ease of removal.
E. Construct molding shapes, recesses, and projections with smooth finish materials and install in forms with sealed joints.

F. Maintain forms clean and free from indentations and warpage. Do not use rust-stained steel surfaces for forms in contact with concrete. Do not sandblast steel form surfaces to remove rust or mill scale; remove these imperfections by grinding.
G. Arrange and assemble formwork to permit dismantling and stripping. Do not damage concrete during stripping. Permit removal of remaining principal shores.
H. Make joints and and seams mortar-tight. Install leakage control materials in accordance with the manufacturer's installation instructions, and in a manner that will maintain a smooth continuity of plane between abutting form panels and which will resist displacement by concreting operations.
I. Provide camber in formwork as required to compensate for deflections caused by weight and pressures of fresh concrete and construction loads and as otherwise indicated. Provide camber strips to compensate for deflections due to permanent loads and long-term deflections due to shrinkage and creep as required.
J. Ensure that formed stair risers within a stair are equal.
K. Edge Forms and Screed for Slabs: Set edge forms or bulkheads and intermediate screeds for slabs to obtain required elevations and contours in the finished slab surface. Support screeds substantially without penetrating waterproof membranes and vapor barriers.
L. Corner Treatment: Form chamfers with 3/4 inch (19 mm) on each leg, unless otherwise indicated, and accurately shape and surface in a manner which will produce uniformly straight lines and edge joints and which will prevent mortar runs. Extend terminal edges to limits, and miter chamfer strips at changes in direction.
M. Construction Joints:
    1. Locate joints as indicated. Support forms for joints in concrete so as to rigidly maintain their positions during placement, vibration, and curing of concrete. Install keys in all joints.
    2. Locate and install construction joints, for which locations are not indicated, so as not to impair strength and appearance of structure, and indicate such joints on Shop Drawings. Locations of construction joints will require approval of the Engineer.
    3. Position joints perpendicular to longitudinal axis of pier, beam or slab as the case may be.
    4. Locate joints in walls, vertically as indicated; at top of footing; at top of slabs on grade; at bottom of door openings; and at underside of the deepest beam or girder framing into wall; or as required to conform to indicated details.
    5. Place construction joints perpendicular to the main reinforcement. Continue reinforcement across construction joints.
N. Load Supports: Carry loads for construction of suspended floor slabs down to on-grade base slabs. Ensure that these loads are not carried by intermediate slabs at any time. Ensure that formwork loads are only carried by structural elements that are supported directly by footings.
O. Obtain approval before framing openings in structural members that are not indicated on drawings.
P. Install EPS Geofoam void filler and gripper plates in accordance with manufacturer's recommendations and structural requirements. Protect from moisture or crushing.
Q. Coordinate this section with other sections of work that require attachment of components to formwork.
R. If formwork is placed after reinforcement, resulting in insufficient concrete cover over reinforcement, request instructions from Architect before proceeding.

3.04 APPLICATION - FORM RELEASE AGENT

A. Apply form release agent on formwork in accordance with manufacturer's recommendations.
B. Apply prior to placement of reinforcing steel, anchoring devices, and embedded items.
C. Do not apply form release agent where concrete surfaces will receive special finishes or applied coverings that are affected by agent. Soak inside surfaces of untreated forms with clean water. Keep surfaces coated prior to placement of concrete.

3.05 INSERTS, EMBEDDED PARTS, AND OPENINGS

A. Provide formed openings where required for items to be embedded in passing through concrete work.
B. Locate and set in place items that will be cast directly into concrete.
C. Coordinate with work of other sections in forming and placing openings, slots, reglets, recesses, sleeves, bolts, anchors, other inserts, and components of other work.
D. Position recessed anchor slots for brick veneer masonry anchors to spacing and intervals specified in Section 04 2001.
E. Install accessories in accordance with manufacturer's instructions, so they are straight, level, and plumb. Ensure items are not disturbed during concrete placement.
F. Install waterstops in accordance with manufacturer's instructions, so they are continuous without displacing reinforcement. Heat seal joints so they are watertight.
G. Provide temporary ports or openings in formwork where required to facilitate cleaning and inspection. Locate openings at bottom of forms to allow flushing water to drain.
H. Close temporary openings with tight fitting panels, flush with inside face of forms, and neatly fitted so joints will not be apparent in exposed concrete surfaces.

3.06 FORM CLEANING AND RE-USE

A. Clean forms as erection proceeds, to remove foreign matter within forms.
B. Clean formed cavities of debris prior to placing concrete.
    1. Flush with water or use compressed air to remove remaining foreign matter. Ensure that water and debris drain to exterior through clean-out ports.
    2. During cold weather, remove ice and snow from within forms. Do not use de-icing salts. Do not use water to clean out forms, unless formwork and concrete construction proceed within heated enclosure. Use compressed air or other means to remove foreign matter.
C. Clean and repair surfaces of forms to be reused in the work. Split, frayed, delaminated, or otherwise damaged form facing material will not be acceptable. Remove such material from the site. Apply form release coating as specified for new formwork.
D. Align and secure joints in a manner that will preclude offsets. Do not use patched forms for exposed concrete surfaces.

3.07 FORMWORK TOLERANCES

A. Construct formwork to maintain tolerances required by ACI 117, unless otherwise indicated.
B. Camber slabs and beams 1/4 inch per 10 feet.

3.08 FIELD QUALITY CONTROL

A. An independent testing agency will perform field quality control tests, as specified in Section 01 4000 - Quality Requirements.
B. Before placing concrete, check lines and grades of erected formwork and positioning of embedded inserts, blockouts, and joints for correctness. Verify that embedded piping and conduit are free from obstruction. Make corrections or adjustments to ensure proper size and location of concrete members and stability of forming systems.
C. While placing concrete, provide quality control to assure that formwork and related supports have not been displaced, that loss of cement paste through joints is prevented, and that completed work will be with specified tolerances.
D. During form removal, verify that architectural features meet form and texture requirements.
E. Inspect erected formwork, shoring, and bracing to ensure that work is in accordance with formwork design, and to verify that supports, fastenings, wedges, ties, and items are secure.

3.09 DETECTION OF MOVEMENT

A. Check movement using methods, such as plumb lines, tell tales, and survey equipment, to detect movement of formwork during concrete placement.

3.10 FORM REMOVAL

A. Do not remove forms or bracing until concrete has gained sufficient strength to carry its own weight and imposed loads.
B. Remove forms by methods which will not injure, mar, gouge, or chip concrete surfaces, overstress concrete members, or distort formwork. Use air pressure or other approved methods. Do not pry against concrete. Cut off nails flush. Leave surfaces clean and unblemished.
C. When repair of surface defects or finishing is required at an early age, forms may be removed as soon as the concrete has hardened sufficiently to resist damage from removal operations and its own weight.
    1. Repair concrete work that has been damaged by removal operations as specified in Section 03 3000 - Concrete. Where exposed surfaces are damaged beyond acceptable repairing measures, remove the damaged concrete and repair with new concrete.
D. Loosen forms carefully. Do not wedge pry bars, hammers, or tools against finish concrete surfaces scheduled for exposure to view.
E. Store removed forms to prevent damage to form materials or to fresh concrete. Discard damaged forms.

END OF SECTION 03 1000

SECTION 03 2000

REINFORCING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Furnish all labor, materials, equipment, tools and services required to fully complete all Reinforcing work as required by the Drawings and/or specified herein including, but not limited to, the following described items.
B. Reinforcing steel for tilt-up concrete.
C. Reinforcing steel for cast-in-place concrete.
D. Reinforcing steel for reinforced unit masonry.
E. Supports and accessories for steel reinforcement.
F. Steel Welded Wire Reinforcement (WWR).
G. Do not include sales tax, refer to 00 1115 - Advertisement for Prequalification of Bidders.

1.02 RELATED REQUIREMENTS

A. Section 03 1000 - Concrete Forming and Accessories.
B. Section 03 3000 - Cast-in-Place Concrete.
C. Section 03 4713 - Tilt-Up Concrete.
D. Section 04 2731 - Engineered Unit Masonry: Reinforcement for engineered masonry.

1.03 REFERENCE STANDARDS

A. ACI 301 - Specifications for Concrete Construction; 2020.
B. ACI SP-66 - ACI Detailing Manual; 2004.
C. ASTM A1064/A1064M - Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete; 2018a.
D. AWS B2.1/B2.1M - Specification for Welding Procedure and Performance Qualification; 2021.
E. AWS D1.4/D1.4M - Structural Welding Code - Steel Reinforcing Bars; 2018, with Amendment (2020).
F. CRSI (DA4) - Manual of Standard Practice; 2009.

1.04 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 the State in which the Project is located.
C. Manufacturer's Certificate: Certify that reinforcing steel and accessories supplied for this project meet or exceed specified requirements.
D. Welders' Qualification Statement: Welders' certificates in accordance with AWS B2.1/B2.1M and dated no more than 12 months before start of scheduled welding work.
E. Reports: Submit certified copies of mill test report of reinforcement materials analysis.

1.05 QUALITY ASSURANCE

A. Perform work of this section in accordance with ACI 301.
    1. Maintain one copy of each document on project site.

B. Provide Architect with access to fabrication plant to facilitate inspection of reinforcement. Provide notification of commencement and duration of shop fabrication in sufficient time to allow inspection.
C. Welder Qualifications: Welding processes and welding operators qualified in accordance with AWS D1.4/D1.4M and no more than 12 months before start of scheduled welding work.

PART 2 PRODUCTS

2.01 REINFORCEMENT

A. Reinforcing Steel: ASTM A615/615M, Grade as indicated in General Structural Notes.
   1. Deformed billet-steel bars.
   2. Unfinished.
B. Stirrup Steel: ASTM A1064/A1064M steel wire, unfinished.
C. Steel Welded Wire Reinforcement (WWR): Galvanized, deformed type; ASTM A1064/A1064M.
   1. Form: Flat Sheets.
   2. WWR Style: 4 x 8-W6 x W10.
D. Reinforcement Accessories:
   1. Tie Wire: Annealed, minimum 16 gauge, 0.0508 inch.
   2. Chairs, Bolsters, Bar Supports, Spacers: Sized and shaped for adequate support of reinforcement during concrete placement.
   3. Provide stainless steel components for placement within 1 1/2 inches of weathering surfaces.

2.02 FABRICATION

A. Fabricate concrete reinforcing in accordance with CRSI (DA4) - Manual of Standard Practice.
B. Welding of reinforcement is not permitted.
C. Locate reinforcing splices not indicated on drawings at point of minimum stress.
   1. Review locations of splices with Architect.

PART 3 EXECUTION

3.01 PLACEMENT

A. Place, support and secure reinforcement against displacement. Do not deviate from required position.
B. Do not displace or damage vapor barrier.
C. Accommodate placement of formed openings.
D. Maintain concrete cover around reinforcing as shown 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 compliance with contract documents before concrete placement.
B. Refer to Structural Drawings for special inspection requirements.

3.03 SCHEDULES- REFER TO STRUCTURAL DRAWINGS

SECTION 03 3000

CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Work included: Provide all labor, materials, equipment, fabrication, incidentals, transportation, placing and supervision necessary to complete all cast-in-place concrete work, its finishing, and all related work called for by the Contract Drawings and/or Specifications, or reasonably inferable from either or both, as needed for a complete and proper installation. Including, but not limited to, the following described items:
B. Concrete for composite floor construction.
C. Concrete floors and slabs on grade.
D. Concrete footings, foundation walls.
E. Joint devices associated with concrete work.
F. Miscellaneous concrete elements, including equipment pads, light pole bases, flagpole bases, thrust blocks, and bollards.
G. Integral concrete color additives.
H. Concrete curing.
I. Do not include sales tax, refer to 00 1115 - Advertisement for Prequalification of Bidders.

1.02 RELATED REQUIREMENTS

A. Section 03 1000 - Concrete Forming and Accessories: Forms and accessories for formwork.
B. Section 03 2000 - Reinforcing.
C. Section 03 3543 - Polished Concrete Finishing: Densifiers, hardeners, applied coatings, and polishing.
D. Section 07 2600 - Underslab Vapor Barrier
E. Section 07 9200 - Joint Sealants: Products and installation for sealants and joint fillers for saw cut joints and isolation joints in slabs.
F. Section 32 1313 - Concrete Paving: Sidewalks, curbs, gutters.
G. Divisions 21, 22, 23: Mechanical items for casting into concrete.
H. Division 26: Electrical items for casting into concrete.

1.03 REFERENCE STANDARDS

A. ACI 301 - Specifications for Concrete Construction; 2020.
B. {RSTEMP#87}ACI 302.1R - Guide for Concrete Floor and Slab Construction; American Concrete Institute International{CH#17564}.
C. ACI 304R - Guide for Measuring, Mixing, Transporting, and Placing Concrete; 2000 (Reapproved 2009).
D. ACI 305R - Test Method for Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact); 1993 (Reapproved 2010).
E. ACI 306R - Guide to Cold Weather Concreting; 2016.
F. {RSTEMP#92}ACI 308R - Guide to Curing Concrete; American Concrete Institute International{CH#17570}.
G. ACI 318 - Building Code Requirements for Structural Concrete; 2019, with Errata (2021).
H. ASTM C39/C39M - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens; 2021.
I. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete; 2021b.
J. ASTM C143/C143M - Standard Test Method for Slump of Hydraulic-Cement Concrete; 2020.

K. ASTM C171 - Standard Specification for Sheet Materials for Curing Concrete; 2020.
L. ASTM C260/C260M - Standard Specification for Air-Entraining Admixtures for Concrete; 2010a (Reapproved 2016).
M. ASTM C309 - Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete; 2019.
N. ASTM C494/C494M - Standard Specification for Chemical Admixtures for Concrete; 2019.
O. ASTM C618 - Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete; 2019.
P. ASTM C881/C881M - Standard Specification for Epoxy-Resin-Base Bonding Systems for Concrete; 2020a.
Q. ASTM C979/C979M - Standard Specification for Pigments for Integrally Colored Concrete; 2016.
R. 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; 2018a.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene one week before starting work of this section.
    1. In areas receiving Special Concrete Floor Finishes coordinate with Finish Manufacturer and Installer for special requirements. Applies to the Sections listed below if any.
        a. Section 03 3511
    2. Topics for discussion may include: design mixture, placement schedule, placement methods, tolerances, curing method, jointing, and slab protection.
    3. Minutes of the meeting shall be recorded, typed, and distributed by the General Contractor to all concerned parties, including but not limited to the Owner's Representative, Architect, and all attendees within 5 days of the meeting.

1.05 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 and special concrete finishes.
C. Mix Design: Submit proposed concrete mix design.
    1. Indicate proposed mix design complies with requirements of ACI 301, Section 4 - Concrete Mixtures.
    2. Indicate proposed mix design complies with requirements of ACI 318, Chapter 5 - Concrete Quality, Mixing and Placing.
D. Shop Drawings: Submit plans showing locations of construction and control joints for Engineer/Owner review.
E. Samples for Pigment Color Selection: Submit manufacturer's complete sample chip set, including pigment number and required dosage rate for each color.
F. Samples: Submit two, 12 inch long samples of construction joint devices.
G. Manufacturer's Installation Instructions: For concrete accessories, indicate installation procedures and interface required with adjacent construction.
H. Project Record Documents: Accurately record actual locations of embedded utilities and components that will be concealed from view upon completion of concrete work.

1.06 QUALITY ASSURANCE

A. Perform work of this section in accordance with ACI 301 and ACI 318.
    1. Maintain one copy of each document on site.

B. Follow recommendations of ACI 305R when concreting during hot weather.
C. Follow recommendations of ACI 306R when concreting during cold weather.
D. Vapor Barrier Installation: Conduct pre-installation conference and installation review prior to concrete placement, either in-person or digitally.

1.07 MOCK-UP

A. Construct and erect mock-up panels for architectural concrete surfaces indicated to receive special color treatments or finishes.
   1. Panel Size: Sufficient to illustrate full range of treatment, 6 x 6 feet (2 x 2 meters) minimum.
   2. Number of Panels: Two.
   3. Locate where directed by Architect.
B. For accurate color, the quantity of concrete mixed to produce the mock-up should not be less than 1 cubic yard and should always be in full yard increments. Construct sample panels using processes and techniques intended for use on permanent work, including curing procedures. Individual workers who will perform the work for the Project will produce the mock-up. Allow for sufficient time for full curing process.
C. Accepted mock-up panel is considered basis of quality for the finished work. Keep mock-up exposed to view for duration of concrete work.
D. Mock-up may not remain as part of the Work.

1.08 WARRANTY

A. This Contractor shall guarantee his work for a period of One (1) year from date of Substantial Completion. Guarantee shall be in form found in Section 01 7800.

PART 2 PRODUCTS

2.01 FORMWORK

A. Comply with requirements of Section 03 1000.

2.02 CONCRETE MATERIALS

A. Cement: ASTM C150/C150M, Type 1 Normal Type II - Moderate or Type II - Moderate Portland type.
   1. Acquire cement for entire project from same source.
B. Fine and Coarse Aggregates: ASTM C 33.
   1. Acquire aggregates for entire project from same source.
C. Fly Ash: ASTM C618, Class F.
D. Powdered Color Additives: Pure, concentrated mineral pigments specifically intended for mixing into concrete and complying with ASTM C979/C979M.
   1. Concentration: Base dosage rates on weight of Portland cement, fly ash, silica fume, and other cementitious materials but not aggregate or sand.
   2. Color(s): As selected by Architect.
      a. Colors with 2 percent maximum color additive.
   3. Manufacturers:
      a. BRICKFORM; BRICKFORM Liquid Integral Color: www.brickform.com
      b. Butterfield Color: www.butterfieldcolor.com.
      c. Davis Colors: www.daviscolors.com.
      d. Solomon Colors; Solomon ColorFlo Liquid Colors: www.solomoncolors.com/#sle.
      e. L.M. Scofield: www.scofield.com.
      f. Substitutions: See Section 01 6000 - Product Requirements.
E. Water: Clean and not detrimental to concrete.

2.03 ADMIXTURES

A. Chemical Admixture:
   1. Manufacturers:
      a. Sika Corporation: www.sikaconstruction.com
      b. GCP Applied Technologies; www.gcpat.com
      c. BASF Chemical Company: www.basf-admixtures.com
      d. [Euclid Chemical Company: www.euclidchemical.com
      e. Substitutions: See Section 01 6000 - Product Requirements.

B. Do not use chemicals that will result in soluble chloride ions in excess of 0.05 percent by weight of cement.

C. All admixtures to come from same manufacturer. Verify that admixtures are compatible.

D. Air Entrainment Admixture: ASTM C260/C260M.
   1. Certification attesting to compliance with ASTM C260/C260M shall be furnished.
   2. All exterior concrete flatwork, curbs and gutters, and catch basins shall have an air-entraining agent added which will yield entrainment.
   3. Manufacturers:
      a. "Micro-Air manufactured by BASF Chemical Company.
      b. "Airen S" manufactured by Euclid Chemical Company.
      c. "Airalon 3000" manufactured by Grace Construction Products.
      d. Substitutions: See Section 01 6000 - Product Requirements.

E. Water Reducing (set controlling) Admixtures:
   1. Concrete shall be adjusted to produce the required rate of hardening for varied climatic and job site conditions.
   2. Admixture shall not reduce the amount of cement required. Amounts as accepted by Architect/Engineer. Do not use calcium chloride or admixtures that contain calcium chloride.
   3. Field Service, when requested, a qualified concrete technician, employed by the manufacturer, shall be available to assist in proportioning concrete materials for optimum use, to advise on proper use of the admixture and adjustment of concrete mix proportions to meet the jobsite and climatic conditions.
   4. High Range Water Reducing Admixture: ASTM C494/C494M Type F.
      a. Approval in writing required from Architect.
   5. Water Reducing and Accelerating Admixture: ASTM C494/C494M Type E.
      a. Under 40 degrees F ambient temperature - Accelerate (Approval in writing required from Architect).
   6. Water Reducing and Retarding Admixture: ASTM C494/C494M Type D.
      a. Over 80 degrees F ambient temperature - Retard.
   7. Water Reducing Admixture: ASTM C494/C494M Type A.
      a. Between 40 degrees F and 80 degrees F ambient temperature - Normal rate of hardening.
   8. Shrinkage Reducing Admixture:
      a. ASTM C494/C494M, Type S.
      b. Manufacturers:
         1) GCP Applied Technologies; Eclipse 4500: www.gcpat.com/#sle.
         2) Substitutions: See Section 01 6000 - Product Requirements.

2.04 ACCESSORY MATERIALS

A. Non-Shrink Epoxy Grout: Moisture-insensitive, two-part; consisting of epoxy resin, non-metallic aggregate, and activator.

1. During epoxy mixing and application process follow the epoxy manufacturer's instructions exactly.
2. All bars anchored in epoxy are to be inspected by the Engineer prior to covering up.
3. Manufacturers:
    a. Refer to Structural Notes.

2.05 BONDING AND JOINTING PRODUCTS

A. Epoxy Bonding System:
    1. Complying with ASTM C881/C881M and of Type required for specific application and moisture insensitive.
    2. Manufacturers:
        a. Euclid Chemical Company; Product - "Duralcrete Epoxy System": www.euclidchemical.com..
        b. Substitutions: See Section 01 6000 - Product Requirements.
B. Slab Isolation Joint Filler: 1/2 inch thick, height equal to slab thickness, with removable top section that will form 1/2 inch deep sealant pocket after removal.
    1. Material: ASTM D1751, cellulose fiber.
C. Slab Contraction Joint Device: Preformed linear strip intended for pressing into wet concrete to provide straight route for shrinkage cracking.

2.06 CURING MATERIALS

A. Evaporation Retarder: Liquid thin-film-forming compound that reduces rapid moisture loss caused by high temperature, low humidity, and high winds; intended for application immediately after concrete placement.
    1. Manufacturers:
        a. Dayton Superior Corporation; AquaFilm Concentrate J74: www.daytonsuperior.com/#sle.
        b. Euclid Chemical Company ; EUCOBAR: www.euclidchemical.com/#sle.
        c. SpecChem, LLC; SpecFilm Concentrate or SpecFilm RTU: www.specchemllc.com/#sle.
        d. W. R. Meadows, Inc; Evapre or Evapre-RTU: www.wrmeadows.com/#sle.
        e. Substitutions: See Section 01 6000 - Product Requirements.
B. Curing Compound, Naturally Dissipating: Clear, water-based, liquid membrane-forming compound, that dissipates within 3 to 5 weeks; complying with ASTM C309 , Type I, Classes A and B.
    1. Manufacturers:
        a. Dayton Superior Corporation; Resin Cure with Dye J11WD: www.daytonsuperior.com/.
        b. Dayton Superior Corporation; Clear Resin Cure J11W: www.daytonsuperior.com.
        c. Dayton Superior Corporation; Clear Cure VOC J7WB: www.daytonsuperior.com.
        d. Euclid Chemical Company; COLOR-CRETE CURE AND SEAL VOC: www.euclidchemical.com/.
        e. Kaufman Products Inc; Thinfilm 420 Resin Base: www.kaufmanproducts.net.
        f. SpecChem, LLC; SpecRez: www.specchemllc.com.
        g. W.R. Meadows, Inc: www.wrmeadows.com.
        h. Substitutions: See Section 01 6000 - Product Requirements.
C. Removable Curing Compound: VOC compliant curing compound designed to be easily removed by the application of a cleaner/remover for all slabs that will receive stains, dyes, sealers, densifiers, coatings, or adhesives. For interior use only.
    1. Products:
        a. Euclid Chemical Company: www.euclidchemical.com.

1) Removable Curing Compound: Kurez RC-100.
2) Cleaner/Remover: Kurez RC-off.

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

D. Curing Compound, Non-dissipating: Liquid, membrane-forming, clear, non-yellowing acrylic; complying with ASTM C309.
1. Vehicle: Water-based.
2. Gloss: Low.
3. Solids by Mass: 18 percent, minimum.
4. VOC Content: OTC compliant.
5. Manufacturers:
a. Dayton Superior Corporation; Cure & Seal 309 EF: www.daytonsuperior.com.
b. Kaufman Products Inc; Krystal 15 Emulsion: www.kaufmanproducts.net.
c. L&M Construction Chemicals, Inc, a subsidiary of Laticrete International, Inc; Dress & Seal WB: www.lmcc.com.
d. L&M Construction Chemicals, Inc, a subsidiary of Laticrete International, Inc; Dress & Seal WB 30: www.lmcc.com.
e. The QUIKRETE Companies; QUIKRETE® Acrylic Concrete Cure & Seal: www.quikrete.com.
f. W. R. Meadows, Inc; VOCOMP-20: www.wrmeadows.com/#sle.
g. Substitutions: See Section 01 6000 - Product Requirements.

E. Curing and Sealing Compound, Low Gloss: Liquid, membrane-forming, clear, non-yellowing acrylic; complying with ASTM C1315 Type 1 Class A.
1. to be used on all exterior concrete
2. Vehicle: Solvent-based.
3. Solids by Mass: 30 percent, minimum.
4. VOC Content: OTC compliant.

F. Moisture-Retaining Sheet: ASTM C171.
1. White-burlap-polyethylene sheet, weighing not less than 10 ounces per linear yard, 40 inches wide.

G. Water: Potable, not detrimental to concrete.

2.07 CONCRETE MIX DESIGN

A. General Concrete Mix Requirements:
1. Design of concrete mixes, including recommended amounts of admixture and water to be used in the mixes, shall be obtained by the Contractor from a qualified independent testing laboratory or agency, or from a mill or ready-mix plant, properly equipped to design concrete mixes. The design shall be performed and certified by a professional engineer currently registered as a civil or structural engineer in the State of Utah. The laboratory, agency, mill, or ready-mix plant shall meet applicable requirements of ASTM E329. Costs of obtaining the mix designs shall be paid by the Contractor.
2. Selection of mix proportions shall conform to the applicable requirements of ACI 211.1 and ACI 211.2. Concrete shall comply with ACI 301 and ACI 318, as applicable. Ensure that mix designs will produce concrete suited for proper placement and finishing.
3. Mix designs shall indicate brands, types, and quantities of admixtures included. If fly ash is proposed, it shall be identified as such (for example, “fly ash”), and the mix design shall identify the percentage of cement replacement.
4. If concrete is to be placed by pumping, concrete mixes shall be designed in accordance with the applicable requirements of ACI 304R and ACI 304.2R, and shall include strengths and slumps.
5. Mix designs shall indicate location of each mix within the structure.

6. Mix designs with replacement of portland cement by weight with fly ash shall not exceed 25 percent.
7. Mix design for architectural concrete and formed concrete which will be exposed to the public in the finished work shall include 10 percent minimum replacement of the cement with fly ash along with a plasticizing admixture, conforming with ASTM C1017, to provide a dense and plastic concrete mix which completely fills out the forms and form detail without air holes and rock pockets.
8. Mix design for integrally colored concrete shall indicate brand type of natural or synthetic metallic oxide or pigment, and quantity used, all prepared as specified in ASTM C979/C979M. Compensate for fly ash with additional pigment as applicable. Concrete encasements of below-grade electrical conduits and ductbanks containing circuits over 600 Volts shall be integrally colored red concrete.
9. Mix design for mass concrete shall have a percentage of fly ash replacement of cement by weight to reduce the amount of heat generated during heat of hydration.
10. Mix designs of exterior concrete shall include air entrainment by total volume of concrete: 4 to 6 percent for 1 1/2 inch maximum size coarse aggregate, 5 to 7 percent for 3/4 or 1 inch maximum size coarse aggregate in accordance with ASTM C173/C173M
11. Aggregates shall conform to Standard Specifications for Concrete Aggregates ASTM C33.
12. Calcium chloride or other materials containing chlorides are corrosive to reinforcing steel and shall not be used as an admixture in post-tensioned concrete.
13. Concrete Strength: Establish required average strength for concrete on the basis of field experience or trial mixtures, as specified in ACI 301.
14. Drying Shrinkage of Concrete: Establish required “Drying Shrinkage” for concrete on thebasis of field experience or trial mixtures, as specified in ASTM C157 and ASTM C490.

B. Type - A - Concrete - all building and exterior concrete. (except as noted for type B concrete)
   1. Normal Weight Concrete:
      a. Compressive Strength, when tested in accordance with ASTM C39/C39M at 28 days:
         1) Footings ..... 3000 PSI
         2) Foundation Walls ..... 3500 PSI
         3) Interior Slabs on Grade ..... 3000 PSI
         4) Exterior Slabs on Grade ..... 4500 PSI
         5) Suspended Slabs..... 4000 PSI
      b. Maximum Shrinkage, when tested in accordance with ASTM C157 at 28 days:
         1) 0.04 percent

C. Type B - Concrete: building concrete slabs to be polished by section 03 3600 "Dyed and Polished Concrete Flooring"
   1. Compressive Strength, when tested in accordance with ASTM C39/C39M at 28 days:
      a. Interior Slabs on Grade ..... 3000 PSI
   2. Maximum Shrinkage, when tested in accordance with ASTM C157 at 28 days:
      a. 0.035 percent.

D. Type C - Concrete: Concrete over metal floor deck. Lightweight concrete, refer to structural notes.

2.08 MIXING

A. Concrete shall be ready-mixed batched, mixed, and transported in accordance with ASTM C94/C94M, "Specifications For Ready-Mixed Concrete," unless a higher standard is called for.
   1. Plant equipment and facilities shall conform to the "Checklist For Certification of Ready Mixed Concrete Production Facilities" of the National Ready-Mixed Concrete Association.

B. A delivery ticket is required for each load of concrete and shall show the following information:
   1. Number of cubic yards.

2. The exact amount of cement and fly ash (if allowed); this can be indicated either by weight or quantity.
3. The amount of mixing water including free moisture in aggregates; this can be indicated either by weight or quantity.
4. Amount of slump in inches.
5. Type of cement.
6. Amount of air entrainment when delivered at job site.
7. Do aggregates meet ASTM specified - yes or no. Indicate maximum size aggregate.
8. Amount and brand (or ASTM) of admixture other than air entraining agent (if any) previously accepted in writing by Architect.

C. These tickets shall be given to the Job Superintendent or Foreman and they shall see that they are delivered to the Architect and Testing Contractor once a week. Note exact location of concrete on job.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify lines, levels, and dimensions before proceeding with work of this section.

3.02 PREPARATION

A. Verify that forms are clean and free of rust before applying release agent.
B. Coordinate placement of embedded items with erection of concrete formwork and placement of form accessories.
C. Where new concrete is to be bonded to previously placed concrete, prepare existing surface by cleaning with steel brush and applying bonding agent in accordance with manufacturer's written instructions.
   1. Use epoxy bonding system for bonding to damp surfaces, for structural load-bearing applications, and where curing under humid conditions is required.
D. In locations where new concrete is doweled to existing work, drill holes in existing concrete, insert steel dowels and pack solid with non-shrink epoxy grout.
E. Interior Slabs on Grade:
   1. Level and compact base material
   2. Install vapor barrier under all interior slabs on grade in accordance with ASTM E1643.
   3. Lap joints minimum 6 inches. Seal joints, seams and penetrations watertight with manufacturer’s recommended products and follow manufacturer’s written instructions.
   4. Extend vapor barrier to the perimeter of the slab. If practical, terminate at the top of slab, otherwise (a) at point acceptable to the structural engineer or (b) where obstructed by impediments, such as rebar, dowels, waterstops, or any other site condition requiring early termination of the vapor barrier.
   5. At point of termination, seal vapor barrier to foundation wall, grade beam, or slab itself. If sealing to foundation wall use double-sided perimeter sealing tape as recommended by manufacturer. When sealing to placed slab, use textured tape engineered to bond to newly placed concrete slabs per manufacturer’s instructions.
   6. Vapor Retarder Over Granular Fill: Install compactible granular fill before placing vapor retarder as indicated on drawings. Do not use sand.
   7. Repair damaged vapor barrier before covering. Avoid use of non-permanent stakes driven through vapor barrier.
F. Subgrade Preparation: Provide final check of finish grading before reinforcing is placed, and make any required adjustments. Provide ground surfaces at optimum moisture content (as determined by Soils Engineer).

3.03 PLACING CONCRETE

A. Place concrete in accordance with ACI 304R.
B. Place concrete for floor slabs in accordance with {RS#87}.
   1. At locations shown on architectural and/or mechanical drawings, provide 6 inch (150 mm) high concrete housekeeping pads where indicated for equipment.
   2. Where floors are indicated to be recessed for topping slab, ceramic or paver tile and also sloped to indicated drains - the concrete subfloor shall be sloped, no exceptions.
   3. Recessed slab at Wood Floor Locations: Coordinate recessed depth with wood floor specifications and approved shop drawings.
   4. Contractor shall be aware that an Underslab Vapor Retarder will be installed and shall protect it during all concrete floor forming and installation. No screed stakes or other penetrations shall be allowed. Contractor shall also take all required precautions to prevent excess moisture from entering the base under the vapor retarder prior to, during, and after installing the concrete slab on grade.
   5. The Soils Engineer shall determine the moisture content of the base material prior to placing the concrete and shall make the final determination as to whether the moisture content of the base material is appropriate for concrete placement.
C. Notify Architect not less than 24 hours prior to commencement of placement operations.
D. Maintain records of concrete placement. Record date, location, quantity, air temperature, and test samples taken.
E. Ensure reinforcement, inserts, waterstops, embedded parts, and formed construction joint devices will not be disturbed during concrete placement.
F. Place concrete continuously between pre-determined expansion, control, and construction joints.
G. Place floor slabs in checkerboard or saw cut pattern indicated.
H. Repair underslab vapor retarder damaged during placement of concrete reinforcing. Repair with vapor retarder material; lap over damaged areas minimum 6 inches (150 mm) and seal watertight.
I. Finish floors level and flat, unless otherwise indicated, within the tolerances specified below.

3.04 SLAB JOINTING

A. Install joint devices in accordance with manufacturer's written instructions.
B. Saw Cut Contraction Joints: Saw cut joints before concrete begins to cool, within 4 to 12 hours after placing; use 3/16 inch thick blade and cut at least 1 inch deep but not less than one quarter (1/4) the depth of the slab.
C. Install joint device anchors for expansion joint assemblies specified in Section 07 9513. Maintain correct position to allow joint cover to be flush with floor and wall finish.
D. Apply sealants in joint devices in accordance with Section 07 9200.

3.05 FLOOR FLATNESS AND LEVELNESS TOLERANCES

A. An independent testing agency, as specified in Section 01 4000, will inspect finished slabs for conformance to specified tolerances.
B. Finish and measure surface so gap at any point between concrete surface and an unleveled freestanding 10-foot (3.05 m) long straightedge, resting on two high spots and placed anywhere on the surface, does not exceed the following:
   1. 1/8 inch (3.2 mm).

3.06 CONCRETE FINISHING

A. Repair surface defects, including tie holes, immediately after removing formwork.

B. Unexposed Form Finish: Rub down or chip off fins or other raised areas 1/4 inch or more in height.
C. Exposed Form Finish: Rub down or chip off and smooth fins or other raised areas 1/4 inch or more in height. Provide finish as follows:
    1. Smooth Rubbed Finish: Wet concrete and rub with carborundum brick or other abrasive, not more than 24 hours after form removal.
    2. 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.
    3. Cork Floated Finish: Immediately after form removal, apply grout with trowel or firm rubber float; compress grout with low-speed grinder, and apply final texture with cork float.
    4. Finish - Exposed Vertical Surfaces to be painted:
        a. Form ties shall be broken back 1 inch from the surface of the concrete.
        b. Form ridges and other projections shall be removed immediately, after forms are removed.
        c. All voids and honeycomb, larger than 5mm in diameter shall be filled with a 1-to-2 cement-fine sand mortar mix.
        d. All patches shall be rubbed with a carborundum brick
        e. Intent is for patches to blend into surface and not stand out after painting.
D. Concrete Slabs: Finish to requirements of {RS#87}, and as follows:
    1. Surfaces to Receive Thick Floor Coverings: "Wood float" as described in {RS#87}; thick floor coverings include quarry tile, ceramic tile, and Portland cement terrazzo with full bed setting system.
    2. Surfaces to Receive Thin Floor Coverings: "Steel trowel" as described in {RS#87}; thin floor coverings include carpeting, resilient flooring, seamless flooring, resinous matrix terrazzo, thin set quarry tile, and thin set ceramic tile.
    3. Exposed Surfaces: Trowel as described in {RS#87}; use steel-reinforced plastic trowel blades instead of steel blades to avoid black-burnish marks; exposed surfaces include all other exposed slab surfaces.
        a. Coordinate with Finish Manufacturer and Installer for special requirements, Refer to Section 03 3511
E. In areas with floor drains, maintain floor elevation at walls; pitch surfaces uniformly to drains.
F. Concrete Polishing: See Section 03 3600

3.07 CURING AND PROTECTION

A. 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.
B. Formed Surfaces: Cure by moist curing with forms in place for full curing period.
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.

3.08 FIELD QUALITY CONTROL

A. Submit proposed mix design of each class of concrete to inspection and testing firm for review prior to commencement of concrete operations.

B. Tests of concrete and concrete materials may be performed at any time to ensure conformance with specified requirements.
C. Compressive Strength Tests: ASTM C39/C39M, for each test, mold and cure three concrete test cylinders. Obtain test samples for every 100 cubic yards or less of each class of concrete placed.
D. Take one additional test cylinder during cold weather concreting, cured on job site under same conditions as concrete it represents.
E. Perform one slump test for each set of test cylinders taken, following procedures of ASTM C143/C143M.

3.09 DEFECTIVE CONCRETE

A. Test Results: The testing agency shall report test results in writing to Architect and Contractor within 24 hours of test.
B. Defective Concrete: Concrete not conforming to required lines, details, dimensions, tolerances, visual appearance or specified requirements as determined by the Architect.
C. Repair or replacement of defective concrete will be determined by the Architect. The cost of additional testing shall be borne by Contractor when defective concrete is identified.
D. Do not patch, fill, touch-up, repair, or replace exposed concrete except upon express direction of Architect for each individual area.

3.10 PROTECTION

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

END OF SECTION 03 3000

This page intentionally left blank

SECTION 03 3515

DYED AND POLISHED CONCRETE FLOORS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Furnish all labor, material, equipment, tools, and services required to fully complete all Dyed and Polished Concrete Floor Finishing work as is indicated on the drawings and/or specified herein including, but not limited to, the following described items.
   1. Dyed and Polished concrete flooring, noted as F4 in floor finish schedule.
   2. Light polished concrete flooring noted as F14 in the floor finish schedule.

B. Do not include sales tax, refer to Section 00 0104 - Notice to Contractors.

1.02 RELATED REQUIREMENTS

A. Section 03 3000 - Cast-in-Place Concrete: Finishing of concrete surface to tolerance; floating, troweling, and similar operations; curing. Control and formed expansion and contraction joints and joint devices.

B. Section 07 9200 - Joint Sealants.

1.03 REFERENCE STANDARDS

A. ANSI B101.3 - DCOF Slip Resistance Test; 2013.

1.04 SUBMITTALS

A. Product Data: For each type of manufactured material and product indicated.

B. Samples for Initial Selection: Manufacturer’s range of colors and reflectivity options.

C. Samples for Verification: Prepare a sample panel approximately 10 feet by 10 feet showing range of tones and sheens possible. Prepare additional panels on site using workmen who will perform actual finishing on the project, until a color and sheen acceptable to the Architect is obtained. Sample to be installed in an area which will receive other floor coverings on the same slab as polished areas.

1.05 QUALITY ASSURANCE

A. Installer Qualifications: An experienced installer who has completed concrete staining work similar in material, design, dollar value, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.

B. All finishers must submit a statement of qualifications including photographs of previous installations, a list of project references including approximate dollar values and contact person, and a manufacturer’s letter of recommendation and/or certification for approval at time of bid.

C. Preinstallation Conference: Conduct conference at Project site, one week prior to starting, covering scheduling and job requirements.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in original packages and containers, with seals unbroken, bearing manufacturer’s labels indicating brand name and directions for storage, mixing with other components, and application.

B. Store materials to comply with manufacturer’s written instructions to prevent deterioration from moisture or other detrimental effects. Do not allow to freeze.

1.07 PROJECT CONDITIONS

A. All concrete floors requiring polishing shall be inspected by the polishing company prior to installation and shall notify the Architect Construction Manager, and General Contractor in writing of any defects or problems, prior to commencing work.Concrete slabs shall meet, but not limited to the following: slab flatness Specified Overall Value (SOV) FF 50 / FL 35 and Minimum Local Value (MLV) FF 33 / FL 24 tolerance for troweled floors in accordance with ACI 117
   1. Concrete slabs shall meet, but not limited to the following: slab flatness Specified Overall Value (SOV) FF 50 / FL 35 and Minimum Local Value (MLV) FF 33 / FL 24 tolerance for troweled floors in accordance with ACI 117.

B. Environmental Limitations: Comply with manufacturer's written instructions for substrate temperature and moisture content, ambient temperature and humidity, ventilation, and other conditions affecting stain and seal performance.
   1. Place concrete treatments only when ambient temperature and temperature of base slabs are between 40 degrees and 90 degrees F.

C. Close areas to all traffic during and after application for time period recommended in writing by manufacturer and until fully cured.

D. No sources of ignition may be present (pilot lights, lighters, and so forth) during application of combustible products.

E. Ensure an abundant supply of electricity and clean water are readily available and accessible.

F. Care must be taken to minimize conditions which may endanger students or faculty.

1.08 WARRANTIES

A. Installer's Warranty: Signed by installer, in which installer agrees to repair or replace installations that fail in workmanship with specified warranty period. Failures include, but are not limited to, the following:
   1. Cracking, flaking, spalling, or de-lamination of color or sealer from substrates.
   2. Not covered under warranty are the failures due to damage by occupants and Owner's maintenance personnel, and other causes not reasonably foreseeable under conditions of use.
   3. Warranty shall be on form found in Section 01 7800.

B. Warranty Period: 10 years from the date of Substantial Completion.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Subject to compliance with project requirements, provide products as manufactured by the following, as specified hereinafter for the specific product:
   1. SASE, Signature Floor System, http://sasecompany.com.
   2. 3M (888) 364-3577 http://www.3m.com/
   3. American Decorative Concrete, Lowell AR (800) 592-9320 http://ameripolish.com/
   4. Convergent Concrete Technologies,Orem, UT (866) 375-2280 http://www.convergentconcrete.com/
   5. HTC (877) 482-8700 http://www.htc-america.com/
   6. Prosoco, Lawrence, KS, (800) 255-4255 www.prosoco.com
   7. Substitutions: See Section 01 6000 - Product Requirements.

2.02 DENSIFIER AND PROTECTIVE TREATMENT PRODUCTS

A. Pre-Densifier Floor Cleaner: As recommended by densifier manufacturer.

B. Densifier: Concrete lithium based chemical densifier specifically for concrete surface treatment which reacts chemically with the concrete surface forming a clear, dense, durable, hard, abrasion-resistant surface. Product shall be a colorless, odorless, water-based solution that is less than 50 VOC.
   1. SASE D2 Densifier High Solids by Signature Floor System.
   2. Prentra-Sil (NL) by Convergent Concrete Technologies.
   3. Consolideck LS by Prosoco.
   4. Ashford Formula by Curecrete.

C. Protective Treatment: Provide protective treatment by same manufacturer as provided for the densifier.

2.03 DYE/STAIN

A. Stain shall be Ameripolish Classic SB Dye by Ameripolish or equivalent.
   1. Colors shall be as selected by architect from manufacturer's full line.

2.04 SEALANT

A. Sealant shall be Flexjoint 85 semirigid control joint filler or equivalent.

2.05 POLISHING PRODUCTS

A. Burnishing Pads: Pads as follows or equivalent as required to produce specified results:
   1. Diamond Impregnated Pads.

2.06 EQUIPMENT

A. Auto-Scrubber machines as required to produce the specified results with at least 150 lbs down head pressure.

B. Burnishing Machine: High speed propane burnisher, with a min. 27 inch head generating pad speeds of 1,500 RPM or higher.

C. Grinding and Polishing Machines: Basis of Design: Walk behind grinder with planetary, counter-rotating 3 or 4 head with variable speed heads, belt or chain driven equipment and at least 1000 pounds down pressure.

PART 3 EXECUTION

3.01 GENERAL CLEANING AND POLISHING

A. Coordinate with joint filling operations. Do not perform wet cleaning within 72 hrs prior to joint filling.

B. Do not use stain or scuff removing agents such as “crete-strip.”

C. Clean floors as specified hereafter prior to grinding and polishing.

D. Grind and polish floors as specified hereafter.

E. Color floors as specified hereafter.

F. Burnish floors as specified hereafter after application of protective treatment.

3.02 CLEANING

A. Power sweep floor area and blow out corners and column footings. Use sweeping compound to control airborne dust. Scrape floor to remove remaining saw cut residue and paint droppings. Remove paint droppings with soft, damp cloth and solvent stripper. Do not use stripper with an acidic pH.

B. Treat oil spots with oil emulsifier and oil absorber materials.

C. Double scrub floor with scrubber machine and appropriate brushes or pads and pH compatible detergent.

3.03 GRINDING AND POLISHING

A. Grind existing concrete as required to remove adhesive residue or painted finish.
   1. Grind out cracks and fill. Fill gouges and chips in concrete.
B. Area to be treated: Polish all areas as directed in floor finish plans.
C. Examination and Preparation:
   1. Examine surfaces to be polished. Verify that surfaces conform to requirements for substrate conditions, including levelness and flatness.
   2. Provide dust containment.
D. Application:
   1. Grinding and polishing shall be performed by certified applicator in accordance with manufacturer's published instructions and samples.
   2. Schedule to begin immediately following cleaning.
   3. Area of work to be closed to traffic for the duration of process.
   4. Grinding/polishing grit pads to be used: Metal 60-80, 120-150, Resin diamond pads: 100, 200, 400, 800. Refer to tables below.
   5. Three-phase 480 Volt electrical supply to be provided by the General Contractor within 50 feet of work area.
   6. Use of diesel powered generator is acceptable with proper ventilation. Placement on the site must be approved by General Contractor.
E. Gloss Level
   1. F4 - Dyed and Polished concrete: Level 3.
   2. F14 - Light polished concrete: Level 1.

Level	Grit	Sheen Level	Minimum No. of Abrasive Passes	Appearance	Gloss Reading
1	Below 100	None to very low	4	Flat, floor has little if any reflectivity	n/a
2	100 to 400	Low to medium	5	Satin or matte appearance with or without slight diffused reflection	40-50
3	400 to 800	Medium to high	6	Semi-polished. Objects being reflected are not quite sharp and crisp, but can be easily identified.	50-60
4	800 and higher	High	7	Highly polished. Objects being reflected are sharp and crisp, with mirror-like clarity.	60-80

F. Aggregate Exposure:
   1. F4 - Dyed and Polished concrete: Class B
   2. F14 - Light polished concrete: Class A

Class	Name	Approximate Surface Cut Depth	Appearance
A	Cream	Very little	Little aggregate exposure
B	Fine aggregate (salt and pepper finish)	1/16 inch	Fine aggregate exposure with little or no medium aggregate at random locations.
C	Medium aggregate	1/8 inch	Medium aggregate exposure with little or no large aggregate exposure at random locations.
D	Large aggregate	1/4 inch	Large aggregate with little or no fine aggregate exposure

3.04 COLORED DYE APPLICATION

A. Area to be treated: Apply dye to all areas as directed in floor finish plans in the pattern shown. Color dilution ratios as per samples approved by architect.

B. DYE APPLICATION TO OCCUR BETWEEN 200 AND 400 RESINS.
   1. Color to be chosen by Architect from Manufacturers full and custom range.

C. Examination and Preparation:
   1. Examine surfaces receiving acetone based dye. Verify that surfaces conform to product manufacturer's requirements for substrate conditions, including levelness, flatness, and absorpsion.
   2. Protect concrete surfaces during curing to prevent uneven curing, and staining by foreign dirt, oil, rust, paint, plumbers putty, chalk stay, red chalk (use blue or yellow), or other substances.
   3. Vacuum and clean saw cut joints and surrounding area so that no dust remains to react with concrete finish material.
   4. If dissipating curing compound has been applied, remove compound prior to application of color. Remove compound by cleaning and scrubbing in accordance with manufacturer’s instructions.
   5. Prior to application, scrub floor with floor cleaner to remove latent salts. Verify floor is free of curing membrane, bond-breaker, and construction laitance. Do not proceed until unsatisfactory conditions have been corrected.
   6. All areas surrounding application area and mix areas to be properly masked off in order to contain color to specified areas.
   7. All pilot lights and other sources of ignition must be removed or neutralized prior to application of color.
   8. Beginning of application indicates acceptance of existing conditions.

D. Application:
   1. Application shall be performed by certified applicator in accordance with manufacturers published instructions and samples
   2. Schedule to begin immediately following cleaning.
   3. Area of application to be completely closed to traffic for the duration of application.
   4. Immediately following application, floor is to be thoroughly washed and rinsed to remove any residual color.

3.05 DENSIFIER APPLICATION

A. Area to be Treated: Apply densifier and protective treatment finish to all specified interior concrete floors.
B. Examination and Preparation:
   1. Examine surfaces receiving densifier concrete finish. Verify that surfaces conform to product manufacturer's requirements for application.
C. Application:
   1. Application shall be performed by certified applicator in accordance with manufacturers published instructions.
   2. Employ methods to ensure concrete surface is not damaged during application, including discoloration.
   3. Apply densifier finish at the rate of 500 SF per gallon.
   4. Apply with low pressure sprayer with enough coverage to keep concrete surface wet for minimum 20 minute period.

3.06 PROTECTIVE TREATMENT APPLICATION

A. Area to be Treated: Subsequent to densifier application and within two weeks prior to Owner Possession, apply protective treatment over surfaces to which densifier has been applied.
B. Examination and Preparation: Prior to application, applicator shall examine the areas and conditions to be treated to assure satisfactory conditions.
C. Application:
   1. Apply in accordance with manufacturer’s published instructions.
   2. Apply at the rate of 1,500 SF per gallon per manufacturer’s recommendation.
   3. Apply with low pressure sprayer.
   4. Use microfiber mopping pads for spreading as required to create a thin film.
   5. Avoid over-application as evidenced by streaking of surface. Remove product completely from areas of over-application and replace with unused sealer.
D. Do not allow water or other liquids to come in contact with finished floor for 72 hours following application of protective treatment.

3.07 BURNISHING PROCEDURE

A. Allow to dry.
B. Burnish at a walking pace using burnishing machine with white or red polishing pads to achieve specified sheen.
C. Burnishing, pad type, and pace of forward movement shall combine to develop a minimum floor surface temperature of 91 degrees F directly below the burnishing pad as continuously measured by the operator during installation.
D. Conduct burnishing operations until the specified gloss is attained. Achieve specified gloss not later than two weeks prior to Owner Possession.

3.08 FINISH REQUIREMENTS

A. Gloss: Final surface gloss shall be a Specified Overall Gloss Value (SOGV) of not less than 30 and a maximum of 45, and a Minimum Local Gloss Value (MLGV) of 20 as measured using a Horiba IG-320 Gloss Checker.
B. Slip Resistance: Measured Dynamic Coefficient of Friction (DCOF) shall be not less than 0.42 as measured in accordance with ANSI B101.3, at time of Owner Possession.

END OF SECTION 03 3515

SECTION 03 4500

PRECAST ARCHITECTURAL CONCRETE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Furnish all labor, materials, equipment, tools and services required to fully complete all Precast Architectural Concrete work as indicated on the drawings and/or specified herein including, but not limited to, the following described items.
B. Architectural Precast Concrete Units:
   1. Interior stair treads.
   2. Free-standing benches.
   3. Interior bench tops.
C. Supports, anchors, and attachments.
D. Do not include sales tax, refer to 00 1115 - Advertisement for Prequalification of Bidders.

1.02 RELATED REQUIREMENTS

A. Section 03 3000 - Cast-in-Place Concrete: Admixtures.
B. Section 04 2731 - Engineered Unit Masonry: Installation of pre-cast units.
C. Section 05 5400 - Metal Fabrications: Stair tread structure.
D. Section 07 9200 - Joint Sealants: Sealing perimeter and intermediate joints.
E. Section 09 3000 - Tiling: Installation of stair treads.
F. Section 09 9724 - Sealers - Interior Concrete, Precast and Masonry Sealers

1.03 REFERENCE STANDARDS

A. {RSTEMP#86}ACI 301 - Specifications for Structural Concrete; American Concrete Institute International{CH#19768}.
B. {RSTEMP#93}ACI 318 - Building Code Requirements for Structural Concrete and Commentary; American Concrete Institute International{CH#19770}.
C. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2019.
D. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2017.
E. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2016a.
F. ASTM A307 - Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength; 2021.
G. ASTM A563 - Standard Specification for Carbon and Alloy Steel Nuts; 2021a.
H. ASTM A563M - Standard Specification for Carbon and Alloy Steel Nuts (Metric); 2021a.
I. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement; 2020.
J. ASTM A775/A775M - Standard Specification for Epoxy-Coated Steel Reinforcing Bars; 2019.
K. ASTM A884/A884M - Standard Specification for Epoxy-Coated Steel Wire and Welded Wire Reinforcement; 2019, with Editorial Revision (2020).
L. ASTM C1602/C1602M - Standard Specification for Mixing Water Used in the Production of Hydraulic Cement Concrete; 2018.
M. ASTM C31/C31M - Standard Practice for Making and Curing Concrete Test Specimens in the Field; 2021a.
N. ASTM C33/C33M - Standard Specification for Concrete Aggregates; 2018.
O. ASTM C143/C143M - Standard Test Method for Slump of Hydraulic-Cement Concrete; 2020.

P. ASTM C150/C150M - Standard Specification for Portland Cement; 2021.
Q. ASTM C260/C260M - Standard Specification for Air-Entraining Admixtures for Concrete; 2010a (Reapproved 2016).
R. ASTM C330/C330M - Standard Specification for Lightweight Aggregates for Structural Concrete; 2017a.
S. ASTM C979/C979M - Standard Specification for Pigments for Integrally Colored Concrete; 2016.
T. ASTM D3963/D3963M - Standard Specification for Fabrication and Jobsite Handling of Epoxy-Coated Steel Reinforcing Bars; 2021.
U. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2020, with Errata (2021).
V. AWS D1.4/D1.4M - Structural Welding Code - Steel Reinforcing Bars; 2018, with Amendment (2020).
W. AWS D1.6/D1.6M - Structural Welding Code - Stainless Steel; 2017, with Amendment (2021).
X. PCI (CERT) - PCI Plant Certification; Current Edition.
Y. PCI MNL-117 - Manual for Quality Control for Plants and Production of Architectural Precast Concrete Products; 2013.
Z. PCI MNL-120 - PCI Design Handbook; 2017, with Errata (2021).
AA. PCI MNL-122 - Architectural Precast Concrete: Fully Revised Manual Including New Sections, Extensive Updates, and Detailed Specifications to Meet Today's Construction Needs.; 2007.
BB. PCI MNL-123 - Connections Manual: Design and Typical Details of Connections for Precast and Prestressed Concrete; 1988.
CC. PCI MNL-135 - Tolerance Manual for Precast and Prestressed Concrete Construction; 2000.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene one week prior to commencing work of this section.

1.05 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. For each type of product installed.
C. Design Mixtures: For each precast concrete mixture. Include results of compressive strength and water-absorption tests.
D. Shop Drawings:
    1. Detail fabrication and installation of architectural precast concrete units.
    2. Indicate locations, plan views, elevations, dimensions, shapes, and cross-sections of each unit.
    3. Indicate aesthetic intent including joints, drips, chamfers, rustications or reveals, and extent and location of each surface finish.
    4. Indicate details at corners.
    5. Indicate separate face and backup mixture locations and thicknesses.
    6. Indicate welded connections by AWS standard symbols and show size, length, and type of each weld.
    7. Indicate locations, tolerances, and details of anchorage devices to be embedded in or attached to structure or other construction.
    8. Indicate locations, extent, and treatment of dry joints if two-stage casting is proposed.
    9. Indicate plan views and elevations showing unit location and dimensions, erection sequences, and bracing plan for special conditions.
    10. Indicate location of each architectural precast concrete unit by same identification mark placed on unit.
    11. Indicate relationship of architectural precast concrete units to adjacent materials.

12. Indicate locations and details of clay product units, including corner units and special shapes with dimensions, and joint treatment.
13. Indicate multiple wythe connection details.
14. Design Modifications: If design modifications are proposed to meet performance requirements and field conditions, notify the Architect and submit design calculations and Shop Drawings. Do not adversely affect the appearance, durability, or strength of units when modifying details or materials and maintain the general design concept.
15. Comprehensive engineering design signed and sealed by qualified professional engineer responsible for its preparation licensed in the jurisdiction in which the project is located. Show governing panel types, connections, concrete cover and reinforcement types, including special reinforcement such as epoxy coated carbon fiber grid. Indicate location, type, magnitude, and direction of loads imposed on the structural frame by the architectural precast concrete.

E. Submit samples of each type, 12x12x2 inches illustrating surface finish and color.
F. Fabricator's Qualification Statement: Provide documentation showing precast concrete fabricator is accredited under IAS AC157.
G. Maintenance Data: Indicate surface cleaning instructions.

1.06 QUALITY ASSURANCE

A. Design Engineer Qualifications: Design precast concrete units under direct supervision of a Professional Structural Engineer experienced in design of precast concrete and licensed in the State in which the Project is located.
B. Fabricator Qualifications:
   1. Firm having at least 2 years of documented experience in production of precast concrete of the type required.
   2. Plant certified under Architectural Precast Association Plant Certification Program for production of architectural precast concrete.
   3. Fabricator Qualifications: Precast concrete fabricator accredited by IAS according to IAS AC157.
   4. Participates in PCI (CERT) Plant Certification program at the time of bidding and is designated a PCI-Certified plant for Group A, Category A1/AT- Architectural Precast Units/Architectural Trim Units.
   5. Has sufficient production capacity to produce required units without delaying the Work.
   6. Certification shall be maintained throughout the production of the precast concrete units. Production shall immediately stop if at any time the fabricator’s certification is revoked, regardless of the status of completion of contracted work. Production will not be allowed to re-start until the necessary corrections are made and certification has been re-established. In the event certification(s) can not be re-established in a timely manner, causing project delays, the fabricator, at no additional cost, will contract out the remainder of the units to be manufactured at a PCI certified plant.
C. Professional Engineer Qualifications: A professional engineer who is licensed in the jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of architectural precast concrete that are similar to those indicated for this Project in material, design, and extent.
D. Design Standards: Comply with {RS#93} and design recommendations of PCI MNL-120, PCI Design Handbook - Precast and Prestressed Concrete, applicable to types of architectural precast concrete units indicated.

E. Quality-Control Standard: For manufacturing procedures and testing requirements, quality-control recommendations, and dimensional tolerances for types of units required, comply with PCI MNL-117, Manual for Quality Control for Plants and Production of Architectural Precast Concrete Products.
   1. Supply a written Quality Assurance Program and Procedure Manual to Architect.

F. Welding: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code – Steel"; AWS D1.4/D1.4M, "Structural Welding Code - Reinforcing Steel" and AWS D1.6/D1.6M Structural Welding Code-Stainless".

G. Sample Units: After sample approval and before fabricating architectural precast concrete units, produce a minimum of two of each type of unit for review by Architect. Incorporate full-scale details of architectural features, finishes, textures, and transitions in sample units.
   1. Locate units where indicated in Contract Document or, if not indicated, as directed by Architect.
   2. Damage part of an exposed-face surface for each finish, color, and texture, and demonstrate adequacy of repair techniques proposed for repair of surface blemishes.
   3. After acceptance of repair technique, maintain one sample unit at the fabricator's plant and one at the Project site in an undisturbed condition as a standard for judging the completed Work.
   4. Demolish and remove sample units when directed.

H. Range Sample Units: After sample unit approval and before fabricating architectural precast concrete units, produce a minimum of three samples, approximately 12 inches long, representing anticipated range of each color and texture on Project's units. Maintain samples at the fabricator's plant as color and texture acceptability reference. Multiple units may be required to achieve required colors.

I. Copies of Documents at Project Site: Maintain at the project site a copy of each referenced document that prescribes execution requirements.

1.07 MOCK-UP

A. Mockups: After sample unit and range sample approval but before production of architectural precast concrete units, construct full-sized mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution. Mockups to be representative of the finished work complete with anchors, connections, flashings, and joint fillers as accepted on the final Shop Drawings. Build mockups to comply with the following requirements, using materials indicated for the completed work:
   1. Build mockups in the location and of the size indicated in Contract Documents or, if not indicated, as directed by Architect.
   2. Notify Architect in advance of dates and times when mockups will be constructed.
   3. Obtain Architect's approval of mockups before starting fabrication of precast concrete units.
   4. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
   5. Demolish and remove mockups when directed.
   6. Approval of mockups does not constitute approval of deviations from the Contact Documents unless such deviations are specifically approved by Architect in writing.

B. Provide full size mock-up of :
   1. Bench top.
   2. Stair tread

C. Locate : Where directed by Architect

D. Approved Mock-up may remain as part of the Work if undisturbed at time of Substantial completion, at the discretion of the Architect.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Handling: Lift and support precast units only from support points.
B. Blocking and Lateral Support During Transport and Storage: Use materials that are clean, non-staining, and non-harmful to exposed surfaces. Provide temporary lateral support to prevent bowing and warping.
C. Protect units to prevent staining, chipping, or spalling of concrete.
D. Mark units with date of production in location that will be concealed after installation.

1.09 GUARANTEE

A. This Contractor shall guarantee his work for a period of 1 year from date of Substantial Completion. Guarantee shall be in form found in Section 01 7800.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Architectural Precast Concrete:
   1. Subject to compliance with requirements; Any manufacturer holding a PCI Group A Plant Certification for the types of products specified; see www.pci.org.
   2. Upwall Pre-Cast Concrete, (435) 673-9377).
   3. Brailsford Cast Stone, Inc: www.brailsfordcast.com.
   4. Eagle Pre-Cast Concrete: www.eagleprecast.com.
   5. Unlimited Designs: www.unlimiteddesigns.com.
   6. Dura-Crete, Inc: www.duracrete.com.
   7. Hanson Structural Precast: www.eagleprecast.com.
   8. Wausau Tile, Inc: www.wasautile.com.
   9. Advanced Forming Technology; www.aftec.com
   10. Substitutions: See Section 01 6000 - Product Requirements.

2.02 PRECAST UNITS, GENERAL

A. Precast Architectural Concrete Units: Comply with PCI MNL-120, PCI MNL-122, PCI MNL-123, PCI MNL-135, and {RS#93}.
   1. Concrete: Minimum 5000 psi, 28 day strength, air entrained to 5 to 7 percent; comply with {RS#86}.
   2. Design Loads: Static loads, anticipated dynamic loading, including positive and negative wind loads, thermal movement loads, and erection forces as defined by applicable code.
   3. Calculate structural properties of units in accordance with {RS#93}.
   4. Accommodate construction tolerances, deflection of building structural members, and clearances of intended openings.
   5. Provide connections that accommodate building movement and thermal movement and adjust to misalignment of structure without unit distortion or damage.

2.03 REINFORCEMENT

A. Reinforcing Steel: ASTM A615/A615M, Grade 40 (40,000 psi).
   1. Deformed billet-steel bars.
   2. Epoxy coated in accordance with ASTM A775/A775M.
B. Steel Welded Wire Reinforcement (WWR): Class A epoxy coated, deformed type, ASTM A884/A884M.
   1. Form: Flat Sheets.
   2. WWR Style: 4 by 8-W6 by W10.

2.04 CONCRETE MATERIALS

A. Cement: ASTM C 150, Type I/II - Normal/Moderate Portland type.
B. Fine and Coarse Structural Aggregates: ASTM C33/C33M.
C. Lightweight Structural Aggregates: ASTM C 330.
D. Color Additives: Pure, concentrated mineral pigments specifically intended for mixing into concrete and complying with ASTM C979/C979M.
    1. Concentration: Base dosage rates on weight of Portland cement, fly ash, silica fume, and other cementitious materials but not aggregate or sand.
    2. Custom Colors: As selected by Architect.
    3. Manufacturers:
        a. Butterfield Color: www.butterfieldcolor.com.
        b. Davis Colors: www.daviscolors.com.
        c. Lambert Corporation: www.lambertusa.com.
        d. Solomon Colors: www.solomoncolors.com
        e. Substitutions: See Section 01 6000 - Product Requirements.
E. Water: ASTM C1602/C1602M; clean, potable, and not detrimental to concrete.
F. Air Entrainment Admixture: ASTM C260/C260M.

2.05 MOLD MATERIALS

A. Molds: Rigid, dimensionally stable, non-absorptive material, warp and buckle free, that will provide continuous and true precast concrete surfaces within fabrication tolerances indicated; nonreactive with concrete and suitable for producing required finishes.
    1. Form-Release Agent: Commercially produced form-release agent that will not bond with, stain, or affect hardening of precast concrete surfaces and will not impair subsequent surface or joint treatments of precast concrete.

2.06 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. Galvanize after fabrication in accordance with requirements of ASTM A123/A123M.
B. Bolts, Nuts, and Washers: ASTM A307 heavy hex bolts, Type A, hot-dip galvanized, with matching ASTM A563 (ASTM A563M) nuts and matching washers.

2.07 FABRICATION

A. Fabricate in compliance with PCI MNL-117 and PCI MNL-135.
B. Fabricate and handle epoxy-coated reinforcing bars in accordance with ASTM D3963/D3963M.
C. Maintain plant records and quality control program during production of precast units. Make records available upon request.
D. Use rigid molds, constructed to maintain precast unit uniform in shape, size, and finish.
E. Maintain consistent quality during manufacture.
F. No onsite cutting allowed. Field verify all unit sizes before fabrication.
G. Fabricate connecting devices, plates, angles, items fit to steel framing members, inserts, bolts, and accessories. Fabricate to permit initial placement and final attachment.
H. Embed reinforcing steel, anchors, inserts plates, angles, and other cast-in items.
I. Locate hoisting devices to permit removal after erection.
J. Cure units to develop concrete quality, and to minimize appearance blemishes such as non-uniformity, staining, or surface cracking.

2.08 FABRICATION TOLERANCES

A. Comply with PCI MNL-117 and PCI MNL-135, except as specifically amended below.
   1. Maximum Variation From Nominal Face Dimensions: Plus or minus 3/32 in.
   2. Maximum Variation From Square or Designated Skew: Plus or minus 1/8 inch in 10 feet.
   3. Maximum Variation from Thickness: Plus or minus 1/8 in.
   4. Maximum Misalignment of Anchors, Inserts, Openings: Plus or minus 1/8 inch.
   5. Maximum Bowing of Members: Plus or minus length/360.

2.09 ACCESSORIES

A. Mortar or Setting Bed: As specified in Section 09 3000
B. Sealants: As specified in Section 07 9200.

2.10 SOURCE QUALITY CONTROL

A. Provide testing of concrete mix.
B. Take one concrete test cylinders for every 5 cu yd of concrete placed; make and cure in accordance with ASTM C31/C31M.
C. Take one slump tests for every six test cylinders in accordance with ASTM C143/C143M.
D. Take one air entrainment test cylinders for each set of exterior concrete test cylinders taken.
E. Take water absorption test in accordance with PCI MNL-117.

2.11 FINISHES

A. Exposed unit faces shall be free of joint marks, grain, and other obvious defects. Corners, including false joints shall be uniform and straight. Finish exposed-face surfaces of architectural precast concrete units to match approved sample units, mockups, and as follows:
   1. Exterior Benches:
      a. Top and edges: Polish as described below
      b. Base: light acid etch
   2. Interior Stair Treads:
      a. Top and front edge: Polish as described below
      b. 2 inch Nosing: Acid etch.
   3. Interior Bench Tops:
      a. Top and edges: Polish as described below.
   4. Polish concrete substrates to expose aggregate and produce sheen level specified and to match approved sample.
      a. Aggregate exposure: Class B
      b. Polish level: Level 3 (semi-polished) 800 grit
   5. Aggregate Exposure Table

Class	Name	Approx. Surface Cut Depth	Apperance
A	Cream	Very Little	Little aggregate exposure
B	Fine Aggregate (salt and pepper)	1/16 inch	Fine aggregate exposure with very little medium aggregate at random locations
C	Medium Aggregate	1/8 inch	Medium aggregate exposure with very little large aggregate at random locations
D	Large Aggregate	1/4 inch	Large aggregate with very little fine aggregate exposure

   6. Gloss Level Table

Level	Grit	Sheen Level	Apperance	

1	Below 100	none to very low	Flat, little reflectivity	
2	100 to 400	low to medium	Satin or matte, slight diffused reflection	
3	400 to 800	medium to high	Semi-polished. Objects being reflected are not quite crisp, but can be identified	
4	800 and up	high	Highly polished. Objects being reflected are crisp, with mirro-like clarity.	

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that building structure, anchors, devices, and openings are ready to receive work of this section.
B. Examine areas to receive precast concrete for the following:
   1. Defects in existing work or substrate.
   2. Dimensional verification of architectural drawings, shop drawings, and substrate.
   3. Deviation beyond allowable tolerances for the substrate.
C. Start work only when defects have been corrected.

3.02 PREPARATION

A. Provide for erection procedures and induced loads during erection. Maintain temporary bracing in place until final support is provided.
B. Precast Tread Layout:
   1. Finish heights at all floors and landings to be established.
   2. Determine exact riser height.
   3. Establish exact tread width.
   4. Layout and mark all finished nosing locations on walls and stringers of stairway.
   5. Check precast tread dimensions before setting.

3.03 ERECTION

A. Erect units without damage to shape or finish. Replace or repair damaged panels.
B. Erect units level and plumb within allowable tolerances.
C. When units require adjustment beyond design or tolerance criteria, discontinue affected work; advise Architect.
D. Stair Treads:
   1. Steel substrate to be primed and anti- fracture membrane installed
   2. Latex-Portland Cement Mortar is applied in a full bed method.
   3. Set treads level and plumb to meet finished nosing layout marks.
   4. Tool front mortar joint smooth and uniform
   5. Caulk as directed by Architect
E. Exposed Joint Dimension: 3/8 inch (9.5 mm). Adjust units so that joint dimensions are within tolerances.

3.04 TOLERANCES

A. Erect members level and plumb within allowable tolerances. Conform to PCI MNL-135 .

3.05 PROTECTION

A. Upon completion, the work shall be ready for final inspection and acceptance by the Owner.

B. Protect the finished work until substantial completion.

END OF SECTION 03 4500

This page intentionally left blank

SECTION 03 4713

TILT-UP CONCRETE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Furnish all labor, materials, equipment, tools and services required to fully complete all Tilt-Up Concrete work as required by the Drawings and/or specified herein including, but not limited to, the following described items.
B. Tilt-up, site cast concrete wall panels, integrally insulated, load-bearing, erected from forms to final position.
C. Supports, devices, load bearing supports, and attachments.
D. Grouting under panels.
E. Do not include sales tax, refer to Section 00 0104 - Notice to Contractors.

1.02 RELATED REQUIREMENTS

A. Section 03 1000 - Concrete Forming and Accessories: Formwork requirements.
B. Section 03 2000 - Reinforcing: Reinforcing steel and welding requirements.
C. Section 03 3000 - Cast-in-Place Concrete: Requirements for concrete for tilt-up panels.
D. Section 03 3000 - Cast-in-Place Concrete: Requirements for casting slab.
E. Section 05 1200 - Structural Steel Framing.
F. Section 05 5000 - Metal Fabrications: Miscellaneous metal for embedment.
G. Section 07 1900 - Exterior Water Repellents and Graffiti-Resistant Sealers.
H. Section 07 2100 - Building Insulation: Requirements for integral insulation.
I. Section 07 6200 - Sheet Metal Flashing and Trim: Requirements for reglets recessed in units.
J. Section 07 9200 - Joint Sealants: Sealing perimeter and intermediate joints.
K. Section 09 9123 - Interior Painting: Field-applied painting of tilt-up panels.
L. Section 09 9724 - Sealers - Interior Concrete, Precast and Masonry Sealers.

1.03 REFERENCE STANDARDS

A. ACI 301 - Specifications for Concrete Construction; 2020.
B. {RSTEMP#89}ACI 304R - Guide for Measuring, Mixing, Transporting, and Placing Concrete; American Concrete Institute International{CH#20598}.
C. {RSTEMP#90}ACI 305R - Hot Weather Concreting{CH#20600}.
D. ACI 306R - Guide to Cold Weather Concreting; 2016.
E. ACI 318 - Building Code Requirements for Structural Concrete; 2019, with Errata (2021).
F. ASHRAE (FUND) - ASHRAE Handbook - Fundamentals; Most Recent Edition Cited by Referring Code or Reference Standard.
G. ASHRAE Std 90.1 I-P - Energy Standard for Buildings Except Low-Rise Residential Buildings; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
H. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2019.
I. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2017.
J. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2016a.
K. ASTM A307 - Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength; 2021.

L. ASTM A563/A563M - Standard Specification for Carbon and Alloy Steel Nuts (Inch and Metric); 2021a.
M. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement; 2020.
N. ASTM C1602/C1602M - Standard Specification for Mixing Water Used in the Production of Hydraulic Cement Concrete; 2018.
O. ASTM C31/C31M - Standard Practice for Making and Curing Concrete Test Specimens in the Field; 2021a.
P. ASTM C33/C33M - Standard Specification for Concrete Aggregates; 2018.
Q. ASTM C78/C78M - Standard Test Method for Flexural Strength of Concrete (Using Simple Beam with Third-Point Loading); 2022.
R. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete; 2021b.
S. ASTM C143/C143M - Standard Test Method for Slump of Hydraulic-Cement Concrete; 2020.
T. ASTM C171 - Standard Specification for Sheet Materials for Curing Concrete; 2020.
U. ASTM C309 - Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete; 2019.
V. ASTM C979/C979M - Standard Specification for Pigments for Integrally Colored Concrete; 2016.
W. ASTM C1107/C1107M - Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink); 2020.
X. ASTM C1289 - Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board; 2022.
Y. AWS B2.1/B2.1M - Specification for Welding Procedure and Performance Qualification; 2021.
Z. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2020, with Errata (2021).

1.04 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene no later than two weeks prior to commencing work of this section.
    1. Contractor shall cast, paint, and erect mock-up panels specified in this Section for observation at this meeting.
    2. The following parties shall be present:
        a. Owner.
        b. Architect.
        c. General Contractor.
        d. Tilt-Up Subcontractor.
        e. Batch Plant Concrete Supplier.
        f. Painting Subcontractor.

1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Product Data: Submit manufacturers' current data on manufactured items used, including recommended methods of installation, relevant installation limitations, and safety precautions.
C. Shop Drawings: Indicate layout, tilt-up unit locations, configuration, unit identification marks, reinforcement, integral insulation, insulated panel system connectors, connection details, support items, location of lifting devices, dimensions, openings, and relationship to adjacent components.
D. Integrally Insulated Panel System Manufacturer's Qualification Statement.
E. Integrally Insulated Panel System Manufacturer's Installation Instructions: Submit manufacturer's current installation instructions for system specified. Certify that copies are available at project site prior to start of tilt-up work.

F. Samples: Submit one panel, 24 inches by 24 inches in size illustrating surface finish, color and texture.
G. Proposed Mix Design: Submit proposed mix design for each tilt-up unit type before starting work, complying with Section 01 4000 - Quality Requirements.
H. Samples for Pigment Color Selection: Submit manufacturer's complete sample chip set, including pigment number and required dosage rate for each color.
I. Laboratory Reports: Submit certified laboratory test reports confirming physical characteristics of materials used in performance of the Work of this section.
J. Integrally Insulated Panel System Design Data:
    1. Thermal Resistance: Submit calculations complying with ASHRAE Std 90.1 I-P, isothermal planes method, and demonstrating thermal resistance of integrally insulated panel system.
    2. Dew Point: Submit calculations complying with ASHRAE (FUND). Demonstrate condensation prevention, prevention of frost or ice formation on panels surfaces, and inner wall condensation potential of _____ ounce per day per square foot or less.
    3. Thermal Bowing and Crack Mitigation: Submit drawing details and written procedures for mitigation and repair of bowing and cracking in insulated concrete panels without full-thickness concrete sections or metallic connectors between wythes.
K. Integrally Insulated Panel System Manufacturer Qualification Statement.
L. Welders' Qualification Statement: Welders' certificates in accordance with AWS B2.1/B2.1M and dated no more than 12 months before start of scheduled welding work.

1.06 QUALITY ASSURANCE

A. Perform work in accordance with ACI 318.
B. Maintain one copy of quality assurance standards on project site.
C. Designer Qualifications: Design units under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed in the State in which the Project is located. Panels shall be engineered for erection stresses and selection of lifting system and hardware. Minimum strength of panels at time of erection shall be in accordance with the lifting design.
D. Fabricator Qualifications: Company specializing in site-cast tilt-up concrete construction with minimum 5 years of documented experience in forming, casting, and erection of panels similar to size and amount as required for this project.
    1. Membership: Member in good standing of the Tilt-Up Concrete Association.
E. Integrally Insulated Panel System Manufacturer Qualifications: Company specializing in manufacturing integrally insulated tilt-up panel system specified in this section, with minimum 3 years of documented experience and approved by system manufacturer.
F. Sandblaster Qualifications: Company with minimum 5 years of documented experience in all types of sand blasting, creating different types of finishes, similar to type and amount as required for the project.
G. Welding Qualifications: Welding processes and welding operators qualified in accordance with AWS D1.1/D1.1M and no more than 12 months before start of scheduled welding work.

1.07 MOCK-UP

A. Provide a minimum of two mock-up panels as quality control for architectural finishes, coordination of work with other sections, testing, and observation of operation.
    1. Panel Sizes: Minimum 4 feet by 8 feet, using forming system and construction methods to be used on project.
    2. Details: Incorporate typical edge, reveal, and finish transition conditions as detailed.
    3. Finishes: Demonstrate full range of texture and inserts to be expected in completed panels.

4. Architectural Liners: Incorporate vertical and horizontal liner joints in mock-up.
5. Construction Joints: Cast mock-up over slab joint or column joint if actual panels will be affected by such condition.

B. Locate where directed and maintain approved mock-up for comparison to finished work.
C. Mock-up may remain as part of the Work.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Handling Tilt-up Units: Lift units to position, consistent with their shape and design. Lift and support only from support points.
B. Blocking and Lateral Support During Erection: Use materials that are clean and non-staining. Provide temporary lateral support to prevent bowing, warping, or cracking.
C. Protect units from staining, chipping, or spalling.

1.09 FIELD CONDITIONS

A. Adverse Weather: Do not construct formwork, place reinforcing steel or concrete, or erect panels during adverse weather unless measures acceptable to Architect are taken to prevent damage.
B. Cold Weather: Comply with provisions of ACI 306R for freezing or near-freezing conditions.
   1. Provide adequate equipment for heating and protecting concrete materials.
   2. Do not use concrete materials, reinforcing steel, forms, fillers, ground surface, or other materials that are frozen, frost-covered or that contain ice.
   3. If shelters are used, do not use fuel that will weaken concrete surfaces.
C. Hot Weather: Comply with provisions of {RS#90} for high temperature conditions.
   1. During periods of dry winds, low humidity, and other conditions that cause rapid drying, protect fresh concrete with an evaporation retardant or fine fog spray of water applied immediately after screeding and bull floating.
   2. Maintain protection until final finishing and curing compounds are applied.

1.10 GUARANTEE

A. This Contractor shall guarantee his work for a period of 1 year from the date of Substantial Completion. Include guarantee on form found in Section 01 7800.

PART 2 PRODUCTS

2.01 TILT-UP PANEL UNITS

A. Tilt-Up Panel Units:
   1. Concrete: Minimum 4500 psi miminum, 28-day strength; compliant with ACI 301.
      a. Unless indicated otherwise in the general structural notes.
   2. Design Loads: Static loads, anticipated dynamic loading, including positive and negative wind loads, thermal movement loads, and erection forces as defined by applicable code.
   3. Calculate structural properties of units in accordance with ACI 318.
   4. No fly ash permitted.
   5. Accommodate construction tolerances, deflection of building structural members, and clearances of intended openings.
   6. Provide connections that accommodate building movement and thermal movement and adjust to misalignment of structure without unit distortion or damage.
   7. Provide lifting hardware and lifting system appropriate to panel size and configuration.

2.02 PANEL MATERIALS

A. Forms: Design to withstand stresses resulting from concrete casting process and to maintain panels within 1/4 inch deflection limit; construct from steel or wood, rigidly braced and with precise corners.
   1. Include blockouts as required to provide openings detailed on drawings, designed to limit deflection during pouring to maximum of 1/8 inch.
   2. Provide smooth and clean forming surfaces.
   3. Panels may be stacked for ease of casting.
   4. For forms attachment to slab, use non-intrusive glues or adhesives whenever possible in lieu of nails and bolts.

B. Concrete Materials:
   1. Cement: ASTM C150/C150M, Type I - Normal Portland type; gray color.
   2. Aggregates: ASTM C33/C33M.
      a. Acquire all aggregates for entire project from same source.
      b. Concrete shall contain the maximum amount of course aggregate consistent with strength and placability.
   3. Water: ASTM C1602/C1602M; clean, potable, and not detrimental to concrete.
   4. Color Additives: Pure, concentrated mineral pigments specifically intended for mixing into concrete and complying with ASTM C979/C979M.
      a. Color(s): As indicated.
      b. Color(s): To match Architect's sample(s) when incorporated into specified mix design(s).
         1) Allow for one pigmented color.
      c. Manufacturers:
         1) Butterfield Color: www.butterfieldcolor.com.
         2) Davis Colors: www.daviscolors.com.
         3) Lambert Corporation: www.lambertusa.com.
         4) L.M. Scofield Co: www.scofield.com.
         5) Substitutions: See Section 01 6000 - Product Requirements.

C. Reinforcing Steel: Sizes and spacing as indicated.
   1. Reinforcing Bars: ASTM A615/A615M deformed steel bars, Grade 60 and Grade 80, refer to general structural notes.

D. Curing Compound: Liquid membrane-forming compound compliant with ASTM C309, Type I and ID, Class B.
   1. Manufacturers:
      a. SpecChem, LLC; Spec Tilt WB: www.specchemllc.com.
      b. Substitutions: See Section 01 6000 - Product Requirements.

E. Curing Covers: Reusable, impregnated fiber mat with a white or light colored backing, compliant with ASTM C171 for reflectivity and moisture retention.

F. Non-Shrink Grout: ASTM C1107/C1107M; premixed compound consisting of non-metallic aggregate, cement, water reducing and plasticizing agents.
   1. Minimum Compressive Strength at 48 Hours: 2,400 psi.
   2. Minimum Compressive Strength at 28 Days: 10,000 psi.
   3. Manufacturers:
      a. SpecChem, LLC; SC Multi-Purpose Grout: www.specchemllc.com.

G. Reveals: For reveals or relief in panel face, provide materials of adequate strength to withstand construction traffic and loads without damage.

H. Miscellaneous Metals:
   1. Provide inserts, dowels, and other items to be cast in panels, including items required for erection and bracing.

2. Steel that will be exposed to the exterior or damp environments in finished panels shall be covered with Brush Grade Asphalt-Based Mastic or EPOXY.

I. Dye / Stain:
   1. Stain shall be Ameripolish Classic SB Dye by Ameripolish or equivalent.
      a. Colors shall be as selected by architect from manufacturer's full line.

2.03 FORM LINERS

A. Pattern: 2/236 California by RECKLI, www.reckli.com.

2.04 REVEAL AND ACCENT STRIPS

A. Material: Non-staining, non-reactive, high-density polyethylene.

2.05 SUPPORT AND LIFTING DEVICES

A. Lifting Hardware, Connecting, and Support Devices: ASTM A36/A36M steel; hot-dip galvanized in accordance with ASTM A153/A153M.
   1. For support of reinforcing steel, plastic-tipped steel or all plastic supports are also acceptable.
B. Miscellaneous Metal Items: Provide inserts, dowels, and other items to be cast into panels as specified in Section 05 5000galvanized after fabrication in accordance with ASTM A123/A123M.
C. All-Plastic Supports: Provide units of adequate strength, with surface contact of not more than 0.10 sq. inches per contact point, and colored to blend with concrete.
D. Bolts, Nuts, and Washers: ASTM A307 heavy hex bolts, Type A, hot-dip galvanized, with matching ASTM A563/A563M nuts and matching washers.
E. Primer: Zinc rich oil alkyd.

2.06 INTEGRALLY INSULATED PANEL SYSTEM

A. Integrally Insulated Panel System: Tilt-up concrete panel formed from two layers of concrete with continuous rigid insulation and non-conducting connectors between layers.
   1. Panel Type: Structurally composite.
   2. Connectors: System manufacturer's standard; corrosion- and alkali-resistant, glass-fiber reinforced, vinyl ester composite pultrusions with serrated profile, and thermoplastic depth-limiting and sealing collar.
   3. Continuous Insulation: Rigid polyisocyanurate (ISO) board insulation, ASTM C1289, Type II, Class 2 - Faced with coated polymer-bonded glass fiber mat facers on both major surfaces of the core foam; factory fabricated with holes or slots for connectors of manufacturer-designated size and spacing.
   4. Provide insulation thickness of 2 inches.
   5. Manufacturers:
      a. Composite Technologies Corporation; Thermomass System NC: www.thermomass.com.
      b. Substitutions: See Section 01 6000 - Product Requirements.

2.07 ACCESSORIES

A. Non-Conduction Connectors for Integral Insulation: Corrosion- and alkali-resistant connectors designed and manufactured for use in insulated composite panels.
B. Integral Insulation: Rigid polyisocyanurate (ISO) board insulation.
C. Bearing Pads: High density plastic, 1/8 inch thick, smooth both sides.
D. Reglets: Specified in Section 07 6200.
E. Joint Sealants: Specified in Section 07 9200.

F. Ceramic Fiber Blanket:
   1. Location: Control joints in fire walls.
   2. Temperature Rating: 2,300 degrees Fahrenheit minimum.
   3. Density: 8 lbs/cu.
   4. Size: 1 inch by 8 inch.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that building structure, anchors, devices, and openings are ready to receive work of this section.
B. Verify that casting slab is cured and ready for work of this section. Fill cracks, saw cuts, joints, or defects that would adversely affect appearance of tilt-up panels.

3.02 PREPARATION

A. Coordinate site cast tilt-up operations with work of other sections to expedite the Work and avoid omissions and delays.
B. Apply bondbreaker to casting slab in accordance with manufacturer's recommendations.
C. Provide for erection procedures and induced loads during erection, and provide for temporary bracing that will remain in place until roof diaphragm has been completely installed and connected.

3.03 FORMING PANELS

A. General: Maintain environmental records and quality control program during production of tilt-up units. Make records available upon request.
B. Lay out panels in manner that will minimize joints in panel faces. Coordinate installation of inserts and anchorages.
C. Use form liners in accordance with manufacturer's instructions.
D. Maintain consistent quality during construction of forms.
E. Fabricate connecting devices, plates, angles, items fit to steel framing members, inserts, bolts, and accessories. Fabricate to permit initial placement and final attachment.
F. Embed reinforcing steel, anchors, inserts plates, angles, and other cast-in items as indicated.
G. Place and embed flashing reglets in continuous lengths without gaps, and properly positioned. Refer to Section 07 6200.
H. Locate hoisting devices to permit removal after erection.
I. Work concrete thoroughly around reinforcement, around embedded items, and into corners of the forms. Consolidate concrete in accordance with ACI recommendations.
J. Cold joints are not permitted in any individual panel.
K. Integrally Insulated Panel System: Comply with manufacturer's written installation instructions.
   1. Install insulation over entire area of panel as soon as possible after leveling first layer of concrete. Insert connectors immediately.
   2. Do not allow concrete to reach initial set before installing connectors.
   3. Fully consolidate concrete around embedded connectors.
   4. Do not disturb concrete after initial set.
   5. Pour second layer of concrete after first layer has fully hardened.
   6. Protect concrete from rain, freezing temperatures, mechanical vibration, or other damage until panel is fully hardened.

3.04 PLACING AND CURING CONCRETE

A. Mix and deliver concrete in accordance with ASTM C94/C94M, Option A, and in compliance with recommendations of {RS#89}.

B. Protect freshly placed concrete from premature drying and excessively hot or cold temperatures.
C. Cure units to develop concrete quality, and to minimize appearance blemishes such as non-uniformity, staining, or surface cracking.
D. Apply liquid membrane curing compound in accordance with manufacturer's recommendations.
E. Moist Curing:
    1. Cover panels completely with burlap strips immediately after finishing. Quickly and completely wet entire exposed surface.
    2. Cover panels with curing covers to prevent evaporation, and keep covered for seven days. Do not allow alternate wetting and drying.
F. Minor patching is acceptable, providing structural adequacy and appearance of units are not impaired.

3.05 FINISHING CONCRETE

A. Finish exposed surfaces of panels as indicated on drawings.
B. Grade A - Architectural Finish:
    1. Panel surfaces must be free of voids, holes, pockets, and other surface deformations greater than 1/8 inch and must not telegraph imperfections from the casting surface, including floor joints.
    2. Cracks in excess of 1/32 inch width are not acceptable.
    3. Reveals may not deviate from their correct position by more than 1/8 inch in 10 feet.
    4. Grind, fill and patch exposed surfaces of panels to produce smooth uniform for painting
    5. Repairs must not be apparent from a minimum distance of 10 feet.
C. Grade B - Standard Finish:
    1. Panel surfaces must be free of voids, holes, pockets, and other surface deformations greater than 1/4 inch.
    2. Curing cracks are acceptable, but structural cracks resulting from erection forces are not acceptable.
    3. Reveals may not deviate from their correct position by more than 1/4 inch in 10 feet.
    4. Repairs must not be apparent from a minimum distance of 25 feet.
D. Grade C - Utility Finish:
    1. Panel surfaces showing voids, holes, pockets, and other surface deformations are permissible, provided they do not affect the structural integrity of the panel and provided they do not exceed 1/2 inch in greatest dimension.
    2. Cracked surfaces are permissible, provided the cracks have not resulted from structural weakness or failure and provided they do not present the potential for failure of the finish over the life of the building.
E. Interior Finish: Trowelled.
F. Painting: Prepare surfaces to be painted as specified in Section 09 9113.

3.06 SITE FABRICATION TOLERANCES

A. Unless otherwise approved by Architect, provide panels complying with casting tolerances as specified below.
B. Panel Height and Width:
    1. Up to 20 feet: 1/4 inch maximum.
    2. 20 to 30 feet: 3/8 inch maximum.
    3. Each additional 10 foot increment: 1/8 inch maximum.
C. Panel Thickness: 3/16 inch maximum average variation through any vertical or horizontal cross section.
D. Skew of Panel or Opening: Measured as difference in length of the two diagonals:
    1. Per 6 feet of diagonal dimension: 1/8 inch maximum.

2. Maximum total difference: 1/2 inch.

E. Panel Openings:
   1. Size: 1/4 inch maximum.
   2. Location of Centerline: 1/4 inch maximum.

F. Location and Placement of Embedded Items:
   1. Inserts, Bolts, and Pipe Sleeves: 3/8 inch.
   2. Lifting and Bracing Inserts: As specified by manufacturer.
   3. Weld Plate Embedments: 1 inch for location; 1/4 inch for tipping and flushness.

3.07 FIELD QUALITY CONTROL

A. An independent testing agency, as specified in Section 01 4000 - Quality Requirements, will perform concrete mix testing.

B. Take minimum of 4 cylinders and 4 beams for each 150 cubic yards or fraction thereof, of each class of concrete, for each day concrete is cast, or not less than once for each 5000 sq ft of panel area. Field cure test specimens.
   1. Beams: Perform casting, curing, and testing in accordance with ASTM C78/C78M. Test two beams prior to panel erection, and average results to determine flexural strength. Retain remaining beams for additional testing, if required.
   2. Cylinders: Make and cure test cylinders in accordance with ASTM C31/C31M. Test two cylinders at 7 days and two at 28 days.

C. Take one slump tests for every six test cylinders in accordance with ASTM C143/C143M.

D. Take one air entrainment test cylinder for each set of exterior concrete test cylinders taken.

E. Submit copies of test reports within 24 hours of test, indicating location of panels for each set of test results.

3.08 DEFECTIVE CONCRETE

A. Defective Concrete: If test results indicate concrete does not comply with specified requirements, Contractor with the agreement of Architect must adjust mix to provide acceptable concrete on subsequent work. For concrete not meeting specified requirements, Owner may require core specimens to be taken and tested, at Contractor's expense. Concrete cores that test below specified requirements will be deemed to be defective.

B. Repair or replacement of defective concrete will be determined by the Architect and will be paid for by Contractor. The cost of additional testing shall be borne by Contractor when defective concrete is identified.

C. Do not patch, fill, touch-up, repair, or replace damaged or defective concrete except upon express direction of Architect for each individual area.

3.09 ERECTION

A. Before beginning erection operations, verify that site conditions are appropriate for the work. Mark elements to comply with designations indicated on approved shop drawings.

B. Employ erection equipment that will prevent damage to existing construction, permanent floor slabs, and tilt-up panels. Protect panels to prevent staining, warping, or cracking.

C. Set panels in assigned positions. Erect members level and plumb within allowable tolerances. Grout space under panels for full bearing, or provide additional support until subsequent grouting operations are completed.

D. Align and maintain uniform horizontal and vertical joints, as erection progresses.

E. When members require adjustment beyond design or tolerance criteria, discontinue affected work; advise Architect.

F. Weld units in place. Perform welding, including tack welds, in accordance with AWS D1.1/D1.1M.

G. Provide non-combustible shields during welding operations.
H. Touch-up field welds and scratched or damaged galvanized surfaces.
I. Brace panels not attached to building frame at time of erection, using a bracing system designed to resist wind and other applicable loads until all structural connections have been made. Provide minimum of two braces per panel and maintain connections daily.
J. Exposed Joint Dimension: 1/2 inch. Adjust units as required to bring joint dimensions within allowable tolerances.
K. Patch holes, cut-off anchors, surface defects, and damaged corners to match panel with epoxy/cement paste adhesive.
L. After panel erection, patch holes or other blemishes in casting slab that were caused by the panel casting or erection processes, using techniques acceptable to Architect.

3.10 ERECTION TOLERANCES

A. Unless otherwise approved by Architect, install site-cast tilt-up panels within erection tolerances as specified below.
B. Replace panels that cannot be installed within specified tolerances.
C. Joint Width Variation:
   1. Up to 20 feet tall panels: 1/4 inch maximum.
   2. Each additional 10 ft increment: 1/8 inch maximum.
   3. Do not increase or decrease joint width more than 50 percent from specified joint width in any case, as measured between panels at exterior face.
D. Joint Taper:
   1. Up to 20 feet tall panels: 1/4 inch maximum.
   2. Each additional 10 ft increment: 1/8 inch maximum.
   3. Maximum for entire length of panel: 3/8 inch width difference for non-parallel panel edges.
E. Panel Alignment:
   1. Horizontal and Vertical Joints: 1/4 inch maximum.
   2. Offset in Adjacent Exterior Panel Faces: 1/4 inch.

3.11 SEALING OF PANEL JOINTS

A. Clean the panel joints of contaminants, including form release agents and concrete laitance. Dust and loose particles shall be blown out or otherwise cleaned to provide proper bond. Apply sealants in accordance with manufacturer’s recommendations.
B. Install fire-resistive blanket where indicated.

3.12 HANDLING AND ERECTION OF PANELS

A. Engineer panels for erection stresses and selection of lifting system and hardware.
   1. Minimum strength of panels at time of erection shall be in accordance with the lifting design.
   2. It is recommended that the Contractor take extra test specimens and field cure to verify concrete strength of panels or demonstrate the acceptable strength through maturity prediction of calibrated mix designs.
   3. Before starting erection operations, Contractor shall check relevant job site conditions insofar as they are ready for the erection of panels. Each element shall be properly marked to correspond with the designation indicated on the approved Shop Drawings.
   4. Use erection equipment that will prevent damage to existing construction, permanent floor slabs and panels. Damage to Work shall be repaired or replaced at the Contractor’s expense and in a manner acceptable to the Architect prior to painting or coating.
   5. Temporary panel bracing shall not be removed until roof diaphragm is completely welded and installed.

B. Set panels in the position assigned. Place panels evenly on prepared setting pads or proper-capacity shims. Grout space under panels for full bearing or provide additional support until grouting takes place.
   1. Provide sufficient number of shims to adequately distribute the load on the footing or grout as soon as practical to prevent damage of the footing.

C. Panels not attached to the building frame at the time of erection shall be braced in position using a bracing system designed to resist wind and other loads that may reasonably be determined until structural connections have been made. There shall be a minimum of two braces per panel. Engineering of bracing shall be the responsibility of the Contractor. Panel bracing connection shall be maintained daily to assure tightness.

D. Dry-pack grout installation and preparation for weld pockets and other panel block outs not cast in during pouring shall be performed as follows:
   1. Remove laitance down to sound concrete.
   2. Surface to receive grout shall be rough and reasonably level.
   3. Surface shall have been properly wet cured.
   4. Do not use curing compounds.
   5. Clean surface of oil, grease, dirt and loose particles.
   6. Remove free water from concrete and bolt holes immediately before grouting.

E. After Panels are Erected:
   1. Check connecting bolts at the floor and panels daily to ensure tightness.
   2. Protect elements to prevent staining, warping or cracking. After panels are erected, dismantle panel erection devices and patch panels as required for a uniform appearance.
   3. After panels are erected, patch holes or other blemishes in casting slab that were caused by the panel casting and erection processes in a manner acceptable to the Architect.

3.13 PROTECTION

A. Protect units from damage by subsequent construction activities.

END OF SECTION 03 4713

This page intentionally left blank

SECTION 04 2001

MASONRY VENEER

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Furnish all labor, materials, equipment, tools and services required to fully complete all Masonry Veneer work as is indicated on the drawings and/or specified herein including, but not limited to, the following described items.
B. Concrete block.
C. Mortar.
D. Integral water-repellent admixtures.
E. Reinforcement and anchorage.
F. Flashing and drainage.
G. Installation of lintels.
H. Accessories.
I. Installation only of precast concrete units integral with masonry walls.
J. Installation only of metal flashings.
K. Do not include sales tax, refer to 00 1115 - Advertisement for Prequalification of Bidders.

1.02 RELATED REQUIREMENTS

A. Section 03 2000 - Reinforcing: Masonry reinforcing.
B. Section 03 4500 - Precast Architectural Concrete: Precast concrete benches.
C. Section 04 2731 - Engineered Unit Masonry: Masonry back-up.
D. Section 05 1200 - Structural Steel Framing
E. Section 05 4000 - Cold-Formed Metal Framing: Steel stud backup for masonry veneer.
F. Section 05 5000 - Metal Fabrications: Loose steel lintels.
G. Section 07 1900 - Exterior Water Repellents and Graffiti Resistant Sealers: Exterior and interior masonry sealers.
H. Section 07 2500 - Membrane Weather Barriers: Membrane flashing system.
I. Section 07 6200 - Sheet Metal Flashing and Trim: Furnish metal flashings for installation by the Section.
J. Section 07 9200 - Joint Sealants: Sealing control and expansion joints.
K. Section 09 9123 - Interior Painting: Interior masonry paint.

1.03 REFERENCE STANDARDS

A. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2016a.
B. ASTM A1064/A1064M - Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete; 2018a.
C. ASTM C1072 - Standard Test Methods for Measurement of Masonry Flexural Bond Strength; 2019.
D. ASTM C1148 - Standard Test Method for Measuring the Drying Shrinkage of Masonry Mortar; 1992a (Reapproved 2014).
E. ASTM C1314 - Standard Test Method for Compressive Strength of Masonry Prisms; 2022.
F. ASTM C1357 - Standard Test Methods for Evaluating Masonry Bond Strength; 2009.
G. ASTM C90 - Standard Specification for Loadbearing Concrete Masonry Units; 2021.
H. ASTM C91/C91M - Standard Specification for Masonry Cement; 2018.
I. ASTM C129 - Standard Specification for Nonloadbearing Concrete Masonry Units; 2017.

J. ASTM C207 - Standard Specification for Hydrated Lime for Masonry Purposes; 2018.
K. ASTM C270 - Standard Specification for Mortar for Unit Masonry; 2019a, with Editorial Revision.
L. ASTM D1056 - Standard Specification for Flexible Cellular Materials—Sponge or Expanded Rubber; 2020.
M. ASTM D1784 - Standard Classification System and Basis for Specification for Rigid Poly(Vinyl Chloride) (PVC) Compounds and Chlorinated Poly(Vinyl Chloride) (CPVC) Compounds; 2020.
N. ASTM D2240 - Standard Test Method for Rubber Property--Durometer Hardness; 2015 (Reapproved 2021).
O. BIA Technical Notes No. 7 - Water Penetration Resistance – Design and Detailing; 2017.
P. ICC (IBC) - International Building Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
Q. ASTM E514/E514M - Standard Test Method for Water Penetration and Leakage Through Masonry; 2020.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene one week before starting work of this section.
   1. See Section 01 3000 - Administrative Requirements, for meeting procedures.
   2. Coordinate with Section 07 2500 - Weather Barriers for compatibility with flashing materials.

1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide data for masonry units, reinforcement and anchorage, mortar, integral water repellent admixture, flashing, drainage, expansion joints, and cleaning solution.
C. Samples:
   1. Submit four samples of each type of masonry unit to illustrate color, texture, and extremes of color range.
   2. Submit two sections of the flashing demonstrating lap joint.
   3. Submit two sections of the expansion joint material, flashing accessories and drainage materials.
D. Manufacturer's Certificate: Certify that masonry units meet or exceed specified requirements.
E. Manufacturers and Installers Qualifications
F. Test Reports: Test reports for each type of veneer block used are to be submitted to the Architect/Engineer for review. Testing and reports are to be completed by an independent laboratory. Test reports shall show:
   1. Compressive strength.
   2. 24-hour cold water absorption.
   3. Saturation coefficient.
   4. Initial rate of absorption (suction).

1.06 QUALITY ASSURANCE

A. Comply with provisions of TMS 402/602, except where exceeded by requirements of Contract Documents.
   1. Maintain one copy of each document on project site.
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.

D. Single-Source Responsibility for Masonry Units: Obtain exposed masonry units of a uniform texture and color, or a uniform blend within the ranges accepted for these characteristics, from one source and by a single manufacturer for each different product required.
E. Single-Source Responsibility for Mortar Materials: Obtain mortar ingredients of a uniform quality, including color for exposed masonry, from one manufacturer for each cementitious component and from one source or producer for each aggregate.

1.07 REGULATORY REQUIREMENTS

A. Conform to the International Building Code ICC (IBC) for necessary requirements for fire-rated masonry construction.

1.08 MOCK-UP

A. Construct a masonry wall as a mock-up panel sized 8 feet long by 6 feet high; include mortar and accessories, structural backup, flashings, and drainage in mock-up.
B. Locate where directed and face south.
C. Mock-up may remain as part of the Work, if undisturbed at time of substantial completion at the discretion of the Architect.

1.09 DELIVERY, STORAGE, AND HANDLING

A. Deliver, handle, and store masonry units by means that will prevent mechanical damage and contamination by other materials.
    1. Store block off ground to prevent contamination by mud, dust or material likely to cause staining or other defects.
    2. Cover materials when necessary to protect from elements.
    3. Protect reinforcement from elements.
    4. Mortar Materials:
        a. Sand shall be kept dry and protected from freezing.
        b. Cement and lime shall be stored off the ground and protected from moisture. In extreme weather, it should be stored in an enclosed space such as a building or trailer.

1.10 FIELD CONDITIONS

A. Cold and Hot Weather Requirements: Comply with requirements of TMS 402/602 or applicable building code, whichever is more stringent.

1.11 GUARANTEE

A. The Contractor shall guarantee his work for a period of One (1) yearfrom date of Substantial Completion. Guarantee shall be on form included in Section 01 7800.

PART 2 PRODUCTS

2.01 CONCRETE MASONRY UNITS

A. Concrete Block: Comply with referenced standards and as follows:
    1. Sizes: Standard units with nominal face dimensions of:
        a. 16 inches by 8 inches (400 mm by 200 mm) and nominal depth of 4 inches (100 mm).
        b. 8 inches by 8 inches (200 mm by 200 mm) and nominal depth of 4 inches (100 mm).
    2. Special Shapes: Provide non-standard blocks configured for corners, lintels, headers, control joint edges, preformed single and double chamfers, and other detailed conditions as indicated or as required to complete the work.
    3. Load-Bearing Units: ASTM C90, normal weight.

a. Hollow block: Refer to General Structural Notes on Drawings.
b. Minimum Unit Strength: 2,800 psi.

4. Non-Loadbearing Units: ASTM C129.
   a. Hollow block, as indicated.
   b. Medium or Normal Weight as specified in structural notes.
5. Exposed Faces: Standard Face, Honed Face, and Split Face units, as shown on drawings
6. Admixtures: Integral Water Repellent Admixtures.
7. Colors:
   a. Colored Honed Face - custom block mix based on standard color (Confetti) as selected by architect.
   b. Colored Split Face / Smooth Face - standard color (Cream).
8. Accepted Manufacturers:
   a. Basis of Design Manufacturer:
      1) Sunroc, Orem, UT / St. George, UT: www.sunroc.net.
   b. Other Acceptable Manufacturers:
      1) Amcor, Inc., Salt Lake City, UT: www.amcormasonry.com.
      2) Richfield Block Co., Richfield, UT.
   c. Substitutions: See section 01 6000 - Product requirements.

2.02 MASONRY CONTRACTORS

A. All masonry contractors must be prequalified by CM/GC.

2.03 MORTAR MATERIALS

A. Refer to General Structural Notes on Drawings.
B. Use type S mortar only.
C. Masonry Cement: ASTM C91/C91M.
   1. Colored mortar: Premixed cement, colors as selected by Architect from manufacturer's full range.
D. Portland Cement: 1, Type I/II; color as required to produce approved color sample.
E. Hydrated Lime: ASTM C207
F. Water: Clean and potable.
G. Accelerating Admixture: Nonchloride type for use in cold weather.

2.04 ADMIXTURES

A. Water Repellent Admixture System: Water repellent compound designed to reduce capillarity. **For all masonry units and mortar.**
   1. Units with Integral Water Repellent: Masonry units, mortar and grout as specified in this section with polymeric liquid or powder admixture added at the time of manufacture.
      a. Performance of Units and Mortar and Grout with Integral Water Repellent:
         1) Water Permeance: Use water-repellent admixtures capable of providing masonry assembly performance of no visible dampness on backs of three wall specimens after 72 hours of testing when evaluated using ASTM E514/E514M
            (a) No water visible on back of wall above flashing at the end of 24 hours.
            (b) No flow of water from flashing equal to or greater than 0.032 gallons per hour at the end of 24 hours.
            (c) No more than 25 percent of wall area above flashing visibly damp at end of test.
         2) Flexural Bond Strength: ASTM C1357, ASTM C1072: minimum 10 percent increase.

3) Compressive Strength of Masonry Prisms: ASTM C1314; maximum 5 percent decrease.
4) Drying Shrinkage: ASTM C1148; maximum 5 percent increase in shrinkage.

b. Use only in combination with mortar and grout that also has integral water repellent admixture.
c. Use water repellent admixtures for masonry units, mortar and grout by a single manufacturer.

2. Acceptable Products:
   a. GCP Applied Technologies, Dry-Block: https://gcpat.com/construction/en-us/masonry-technology.
   b. BASF, Rheopel: www.basf-admixtures.com.
   c. Euclid Chemical Co., Eucon Blocktite: www.euclidchemical.com.
   d. Substitutions: See Section 01 6000 - Product Requirements.

2.05 REINFORCEMENT AND ANCHORAGE

A. Manufacturers:
   1. Hohmann & Barnard, Inc. (including Dur-O-Wal brand): www.h-b.com.
   2. Blok-Lok Limited: www.blok-lok.com.
   3. WIRE-BOND: www.wirebond.com.
   4. Halfen Anchoring Systems: www.halfenusa.com.
   5. Substitutions: See Section 01 6000 - Product Requirements.

B. Reinforcing Steel: Refer to Section 03 2000 - Reinforcing.

C. Masonry Veneer Seismic Wire Ties and Accessories (Masonry Backup Conditions):
   1. Wire Tie: Rectangular shape brick anchor, ASTM A1064/A1064M steel wire, hot dip galvanized after fabrication to ASTM A153/A153M, Class B2; 0.1875 inch (4.8 mm) diameter wire, fitting into wire loops of horizontal joint reinforcement, bent to form 1 inch offset, providing additional 1 inch of vertical coursing adjustment.
      a. Projection: As required for indicated wall cavity dimension.
      b. Acceptable Product: Byna-Lok Wire Tie manufactured by Hohmann & Barnard.
   2. Rigid Insulation Retainer: Polyvinyl chloride (PVC) clip-type retainer for rigid board insulation; attaches to loop wires on horizontal joint reinforcement.
      a. Acceptable Product: Wedge-Lok manufactured by Blok-Lok.
   3. Continuous Horizontal Joint Reinforcement Wire: ASTM A1064/A1064M steel wire, hot dip galvanized after fabrication to ASTM A153/A153M, Class B2; 0.1483 inch (3.8 mm).
   4. Reinforcement Retaining Clip: Rigid polyvinyl chloride clip, conforming to ASTM D1784 and ASTM D2240, with ridge to secure continuous wire in mortar and 3 additional ridges to secure masonry wire tie.
      a. Acceptable Products:

D. Masonry Veneer Seismic Anchors (Steel Stud Backup Conditions): 2-piece anchors that permit differential movement between masonry veneer and structural backup, hot dip galvanized to ASTM A 153/A 153M, Class B.
   1. Anchor plates: Not less than 0.075 inch thick, designed for fastening to structural backup through sheathing by two fasteners; provide design with legs that penetrate sheathing and insulation to provide positive anchorage.
   2. Wire ties: Trapezoidal shape, 0.1875 inch thick.
   3. Vertical adjustment: Not less than 3-1/2 inches.
   4. Continuous Horizontal Joint Reinforcement Wire: ASTM A1064/A1064M steel wire, hot dip galvanized after fabrication to ASTM A153/A153M, Class B2; 0.1483 inch (3.8 mm).
   5. Reinforcement Retaining Clip: Rigid polyvinyl chloride clip, conforming to ASTM D1784 and ASTM D2240, with ridge to secure continuous wire in mortar and 3 additional ridges to secure masonry wire tie.

6. Self-Sealing Transition Anchor Tape: Reinforced polyolefin base, laminated to a polypropylene layer; seals around the shaft of the screw and legs of anchors at the point of penetration.
7. Fasteners: Self-drilling stainless steel, Type 410, self-tapping screws; hex washer head, size #10 - 16, lengths required for indicated insulation and sheathing thicknesses. Provide neoprene sealing washers.
8. Acceptable Product: X-Seal S.I.S. Anchoring System manufactured by Hohmann & Barnard, Inc.

2.06 FLASHING AND DRAINAGE

A. Manufacturers:
   1. York Manufacturing, Inc.: www.yorkmfg.com.
   2. Hohmann & Barnard, Inc. (including Blok-Lok Limited): www.h-b.com.
   3. WIRE-BOND: www.wirebond.com.
   4. Dupont Tyvek: www.construction.tyvek.com.
   5. Mortar Net USA Ltd.: www.mortarnet.com.
   6. CavClear/Archovations, Inc.: www.cavclear.com.
   7. Substitutions: See Section 01 6000 - Product Requirements.

B. Flashing Membrane:
   1. Reinforced 40-mil thick membrane formulated with Elvaloy Kee, with pressure-sensitive adhesive.
   2. Corners and End Dams: Pre-formed seamless corners and end dams, same material as flashing membrane.
   3. Primers, Adhesives, Sealants, and Accessories: As recommended by membrane manufacturer for complete installation.
   4. Acceptable Products:
      a. Flex-Flash Flashing manufactured by Hohmann & Barnard, Inc.
      b. Rhino-Bond Flashing manufactured by Wire-Bond.
      c. Dupont Thru-Wall Flashing manufactured by Dupont Tyvek.

C. Metal Drip Edge:
   1. Installation only 24 gauge, 0.028 inch (0.7 mm) thick, Pre-Finished Galvanized Steel with hemmed edge, provided by Section 07 6200 - Sheet Metal Flashing and Trim.
      a. Sealants and Accessories: As recommended by flashing membrane manufacturer for complete installation.

D. Termination Bars: Stainless steel; compatible with membrane and adhesives.
   1. Manufacturers:
      a. Hohmann & Barnard, Inc: www.h-b.com.
      b. Mortar Net Solutions; Termination Bars: www.mortarnet.com.
      c. York Manufacturing, Inc: www.yorkmfg.com.
      d. Substitutions: See Section 01 6000 - Product Requirements.

2.07 ACCESSORIES

A. Expansion Joints:
   1. Vertical Expansion Joint: Closed cell neoprene conforming to ASTM D1056, RE41 Grade 2A1; non-adhesive; compression up to 50 percent; 3/8 inch thick by 3 inches wide by length required.
   2. Horizontal Expansion Joint: Closed cell neoprene conforming to ASTM D1056, RE41 Grade 2A1; adhesive on one side; compression up to 50 percent.
   3. Sealants: Types as specified in Section 07 9200 - Joint Sealants.
   4. Manufacturers:
      a. Hohmann & Barnard, Inc: www.h-b.com.

b. WIRE-BOND: www.wirebond.com.
c. Substitutions: See Section 01 6000 - Product Requirements.

B. Weeps: Polyethylene tubing, clear round plastic weep tubes, 3/8 inch outside diameter by 1/4 inch inside diameter by 4 inches long.
1. Manufacturers:
a. Blok-Lok Limited: www.blok-lok.com.
b. Hohmann & Barnard, Inc: www.h-b.com.
c. WIRE-BOND: www.wirebond.com.

C. Cavity Mortar Control: Polyester mesh trapezoidal shaped panels impregnated with UV protection, biocide to resist mold and flame retardant, sized to thickness of wall cavity, and designed to prevent mortar droppings from clogging weeps and cavity vents and allow proper cavity drainage.
1. Manufacturers:
a. Substitutions: See Section 01 6000 - Product Requirements.

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

2.08 MORTAR AND GROUT MIXING

A. Mortar for Unit Masonry: ASTM C270, Proportion Specification.
1. Exterior, non-load-bearing masonry, Type N.

B. Colored Mortar: Proportion selected pigments and other ingredients to match Architect's sample, without exceeding manufacturer's recommended pigment-to-cement ratio.

C. Use only mortar containing integral water repellent mortar admixture at the manufacturer's recommended addition rate and mixed according to the manufacturer's recommendations.

D. Mixing: Use mechanical batch mixer and comply with referenced standards.
1. Add integral water repellent admixture during mixing in conformance with the admixture label instructions and the recommendations of the manufacturer.

PART 3 EXECUTION

3.01 EXAMINATION

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

B. Verify that related items provided under other sections are properly sized and located.

C. Verify that built-in items are in proper location, and ready for roughing into masonry work.

3.02 FLASHING INSTALLATION

A. Surface Preparation: Prepare surface in accordance with manufacturer's written recommendations. Verify that flashing materials are compatible with Section 07 2500 - Weather Barrier systems.

B. Install flashing in accordance with manufacturer's instructions.

C. Accurately fit, align, securely fasten and install free from distortion or defects.

3.03 COURSING

A. Establish lines, levels, and coursing indicated. Protect from displacement.

B. Maintain masonry courses to uniform dimension. Form vertical and horizontal joints of uniform thickness.

C. Concrete Masonry Units:
1. Bond: Running, half bond. Refer to Drawings.
2. Coursing: One unit and one mortar joint to equal 8 inches.
3. Mortar Joints: Concave.

3.04 PLACING AND BONDING

A. Lay hollow masonry units with face shell bedding on head and bed joints.
B. Buttering corners of joints or excessive furrowing of mortar joints is not permitted.
C. Remove excess mortar as work progresses.
D. Interlock intersections and external corners, except for units laid in stack bond.
E. Do not shift or tap masonry units after mortar has achieved initial set. Where adjustment must be made, remove mortar and replace.
F. Perform job site cutting of masonry units with proper tools to provide straight, clean, unchipped edges. Prevent broken masonry unit corners or edges.
G. Isolate top joint of masonry veneer from horizontal structural framing members or support angles with horizontal expansion joint material.

3.05 WEEPS/CAVITY VENTS

A. Install weeps in veneer walls at 24 inches on center horizontally on top of through-wall flashing above shelf angles and lintels and at bottom of walls.
B. Install cavity mortar diverter at base of cavity as recommended by manufacturer to prevent mortar droppings from blocking weep/cavity vents.
C. Do not permit mortar to drop or accumulate into cavity air space or to plug weep/cavity vents.

3.06 CAVITY MORTAR CONTROL

A. Do not permit mortar to drop or accumulate into cavity air space or to plug weep/cavity vents.
B. For cavity walls, build inner wythe ahead of outer wythe to accommodate accessories.
C. Install cavity mortar control panels continuously throughout full height of exterior masonry cavities during construction of exterior wythe, complying with manufacturer's installation instructions.
    1. Verify that airspace width is no more than 3/8 inch greater than panel thickness.
    2. Hold cavity mortar control panel tight to face wythe.
    3. Install horizontally between joint reinforcement.
    4. Stagger end joints in adjacent rows.
    5. Fit to perimeter construction and penetrations without voids.
D. Install cavity mortar diverter at base of cavity and at other flashing locations as recommended by manufacturer to prevent mortar droppings from blocking weep/cavity vents.

3.07 REINFORCEMENT AND ANCHORAGE - MASONRY VENEER

A. Install masonry reinforcement system components in accordance with manufacturer's printed installation instructions.
B. Masonry Back-Up:
    1. Refer to Section 04 2731 - Reinforced Unit Masonry for installation of horizontal joint reinforcement.
    2. Secure rigid insulation in place with rigid insulation retainer at each masonry wall tie connector location on horizontal joint reinforcement.
    3. Install masonry wall tie at each masonry wall tie connector location on horizontal joint reinforcement; install ties as exterior wythe of masonry construction progresses.
    4. Set reinforcement retaining clip in full mortar bed at each masonry wall tie location; secure tie wires in correct size ridges.
    5. Secure continuous masonry joint reinforcement wire in correct size ridge in reinforcement retaining clip.
C. Stud Back-Up:

1. Install sealing tape at stud locations to receive veneer anchors; install tape vertically, continuous full stud length.
2. Install veneer anchors at stud locations; 16 inches on center vertically, 16 inches on center horizontally.
3. Screw-attach veneer anchor to stud face; bridging insulation and sheathing to ensure full contact of veneer anchor legs with stud face.
4. Install masonry wall tie at each veneer anchor location; install ties as exterior wythe of masonry construction progresses.
5. Set reinforcement retaining clip in full mortar bed at each masonry wall tie location; secure tie wires in correct size ridges.
6. Secure continuous masonry joint reinforcement wire in correct size ridge in reinforcement retaining clip.

3.08 MASONRY FLASHING

A. Surface Preparation: Prepare surface in accordance with manufacturer's written recommendations. Verify that flashing materials are compatible with Section 07 2500 - Weather Barrier systems.
B. Install flashing in accordance with manufacturer's instructions.
C. Accurately fit, align, securely fasten and install free from distortion or defects.
D. Whether or not specifically indicated, install masonry flashing to divert water to exterior at all locations where downward flow of water will be interrupted.
   1. Extend flashings full width at such interruptions and at least 6 inches, minimum, into adjacent masonry or turn up at least 1 inch, minimum, to form watertight pan at non-masonry construction.
   2. Remove or cover protrusions or sharp edges that could puncture flashings.
   3. Seal lapped ends and penetrations of flashing before covering with mortar.
E. Extend metal flashings through exterior face of masonry and terminate in an angled drip with hemmed edge. Install joint sealer below drip edge to prevent moisture migration under flashing.
F. Lap end joints of flashings at least 4 inches and seal watertight as directed by flashing manufacturer.

3.09 CONTROL AND EXPANSION JOINTS

A. Install expansion joint components in accordance with manufacturer's installation instructions.
B. Do not continue horizontal joint reinforcement through control or expansion joints.
C. Form expansion joint as detailed on drawings.
D. This Contractor shall coordinate locations of joints with structural columns, masonry layout, and suggested joint layout on the Drawings, including those that extend to upper floor levels.
   1. Maximum spacing shall be 30 feet (9.1 m) on center, unless approved by the Architect, and preferred spacing of 24 feet (7.3 m) to 28 feet (8.5 m) on center.
E. Where masonry veneer occurs at concrete block backup, joints shall align.

3.10 TOLERANCES

A. Maximum Variation From Unit to Adjacent Unit: 1/16 inch.
B. Maximum Variation from Plane of Wall: 1/4 inch in 10 feet and 1/2 inch in 20 feet or more.
C. Maximum Variation from Plumb: 1/4 inch per story non-cumulative; 1/2 inch in two stories or more.
D. Maximum Variation from Level Coursing: 1/8 inch in 3 feet and 1/4 inch in 10 feet; 1/2 inch in 30 feet.
E. Maximum Variation of Mortar Joint Thickness: Head joint, minus 1/4 inch, plus 3/8 inch.

3.11 CUTTING AND FITTING

A. Cut and fit for pipes and conduit. Coordinate with other sections of work to provide correct size, shape, and location.
B. Obtain approval prior to cutting or fitting masonry work not indicated or where appearance or strength of masonry work may be impaired.

3.12 CLEANING

A. Remove excess mortar and mortar smears as work progresses.
B. Replace defective mortar. Match adjacent work.
C. Thoroughly wet surface of masonry on which no green efflorescence appears.
D. Clean soiled surfaces with cleaning solution.
    1. Follow block/brick manufacturer's recommendations for cleaning.
    2. Protect all sash, metal lintels, and other corrodible parts when masonry is cleaned with acid solution.
    3. Immediately rinse with clear water.
    4. Do small sections at a time.
    5. Work from top to bottom.
E. Remove all efflorescence in accordance with block/brick manufacturer's recommendations.
F. Use non-metallic tools in cleaning operations.
G. If using pressure washers for cleaning, adjust pressure so as not to "pock," sandblast or otherwise damage the face of masonry units. All units damaged in such manner shall be removed and replaced by the masonry contractor at no expense ot the Owner.

3.13 PROTECTION

A. Without damaging completed work, provide protective boards at exposed external corners that are subject to damage by construction activities.
B. Protection of Masonry:
    1. Wall Covering:
        a. During erection, and after completion, cover top of all walls with strong waterproof membrane.
        b. Extend cover minimum of 24 inches (610 mm) down both sides.
        c. Hold cover securely in place and maintain throughout construction until all walls are covered with roofing membrane and/or cap flashings.
C. Staining:
    1. Prevent grout or mortar from staining the face of masonry to be left exposed or painted:
        a. Immediately remove grout or mortar in contact with face of such masonry.
        b. Protect all sills, ledges and projections from droppings of mortar, protect door jambs and corners from damage during construction.
D. Cold Weather Protection:
    1. Preparation:
        a. If ice or snow has formed on masonry bed, remove by carefully applying heat until top surface is dry to the touch.
        b. Remove all masonry frozen or damaged.
    2. When brick suction exceeds recommendations, sprinkle with heated water:
        a. When units are above 32 degrees F, heat water above 70 degrees F.
        b. When units are below 32 degrees F, heat water above 130 degrees F.
    3. Use dry masonry units.
    4. Do not use wet or frozen units.
E. Construction requirements while work is progressing:

1. Air Temperature 40 degrees F to 32 degrees F:
   a. Heat sand or mixing water to produce mortar temperatures between 40 degrees F and 120 degrees F.
   b. Cover walls and materials to prevent wetting and freezing. Covers should be plastic or canvas.
2. Air Temperature 32 degrees F to 25 degrees F:
   a. Heat sand and mixing water to produce mortar temperatures between 40 degrees F and 120 degrees F.
   b. Maintain temperatures of mortar on boards above freezing.
   c. With wind velocities over 15 mph pro- vide windbreaks during the work- day and cover walls and materials at the end of the day to prevent wetting and freezing.
   d. Maintain masonry above freezing for 16 hours using auxiliary heat or insulated blankets.
   e. Heat grout materials to 90 degrees F to produce in-place grout temperature of 70 degrees F at end of work day.
3. Air Temperature 25 degrees F to 2 degrees F:
   a. Heat sand and mixing water to produce mortar temperatures between 40 degrees F and 120 degrees F.
   b. Maintain mortar temperatures on boards above freezing.
   c. Use salamanders or other heat sources on both sides of walls under construction.
   d. Use windbreaks when wind is in excess of 15 mph.
   e. Heat grout materials to 90 degrees F to produce in-place grout temperature of 70 degrees F at end of work day.
4. Air Temperature 20 degrees F and Below:
   a. Heat sand and mixing water to produce mortar temperatures between 40 degrees F and 120 degrees F.
   b. Provide enclosures and auxiliary heat to maintain air temperature above 32 degrees F.
   c. Minimum temp. of units when laid: _____ degrees F.
   d. Heat grout materials to 90 degrees F to produce in-place grout temperature of 70 degrees F at end of work day.

F. Protection Requirements For Completed Masonry and Masonry Not Being Worked On:
1. Minimum air temperature 40 degrees F to 32 degrees F:
   a. Refer to paragraph 3.14-B.
2. Mimimuim air temperature 32 degrees F to 25 degrees F:
   a. Refer to paragraph 3.14-B.
3. Mimimum air temperature 25 degrees F to 20 degrees F:
   a. Completely cover masonry with insulating blankets or equal protection for 24 hours, 48 hours for grouted masonry.
   b. Refer to paragraph 3.14-B.
4. Minimum air temperature 20 degrees F and below:
   a. Maintain masonry temperature above 32 degrees F for 24 hours by:
      1) Enclosure and supplementary heat
      2) Electric heating blankets
      3) Infrared lamps
      4) Or ther methods acceptable to the Architect/Engineer.
   b. Refer to paragraph 3.14-B.

END OF SECTION 04 2001

This page intentionally left blank

SECTION 04 2731

ENGINEERED UNIT MASONRY

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Furnish all labor, materials, equipment, tools and services required to fully complete all Reinforced Unit Masonry work as is indicated on the drawings and/or specified herein including, but not limited to, the following described items.
B. Concrete block.
C. Mortar and grout.
D. Integral water repellent admixture.
E. Reinforcement and anchorage.
    1. Installation only of reinforcing steel within all masonry.
F. Installation only of metal flashings.
G. Masonry lintels.
H. Installation only of precast architectural concrete units integral with masonry walls.
I. Accessories.
J. Do not include sales tax, refer to Section 00 1115 - Advertisement for Prequalification of Bidders.

1.02 RELATED REQUIREMENTS

A. Section 03 2000 - Reinforcing: Reinforcing steel for grouted masonry.
B. Section 03 4500 - Precast Architectural Concrete: Precast concrete lintels and decorative units.
C. Section 04 2001 - Masonry Veneer.
D. Section 05 5000 - Metal Fabrications: Loose steel lintels.
E. Section 07 1900 - Exterior Water Repellents and Graffiti Resistant Sealers: Exterior and Interior masonry sealer.
F. Section 07 2500 - Membrane Weather Barriers.
G. Section 07 6200 - Sheet Metal Flashing and Trim: Metal flashings.
H. Section 07 8400 - Firestopping: Firestopping at penetrations of masonry work.
I. Section 07 9200 - Joint Sealants: Sealing control and expansion joints.
J. Section 09 9123 - Interior Painting: Painting of masonry work.

1.03 REFERENCE STANDARDS

A. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2016a.
B. ASTM C109/C109M - Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-in. or [50 mm] Cube Specimens); 2021.
C. ASTM C1148 - Standard Test Method for Measuring the Drying Shrinkage of Masonry Mortar; 1992a (Reapproved 2014).
D. ASTM C331/C331M - Standard Specification for Lightweight Aggregates for Concrete Masonry Units; 2017.
E. ASTM C67/C67M - Standard Test Methods for Sampling and Testing Brick and Structural Clay Tile; 2021.
F. ASTM C90 - Standard Specification for Loadbearing Concrete Masonry Units; 2021.
G. ASTM C91/C91M - Standard Specification for Masonry Cement; 2018.
H. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete; 2021b.

I. ASTM C140/C140M - Standard Test Methods for Sampling and Testing Concrete Masonry Units and Related Units; 2022a.
J. ASTM C144 - Standard Specification for Aggregate for Masonry Mortar; 2018.
K. ASTM C207 - Standard Specification for Hydrated Lime for Masonry Purposes; 2018.
L. ASTM C270 - Standard Specification for Mortar for Unit Masonry; 2019a, with Editorial Revision.
M. ASTM C404 - Standard Specification for Aggregates for Masonry Grout; 2018.
N. ASTM C476 - Standard Specification for Grout for Masonry; 2020.
O. ASTM C652 - Standard Specification for Hollow Brick (Hollow Masonry Units Made From Clay or Shale); 2021.
P. ASTM C780 - Standard Test Method for Preconstruction and Construction Evaluation of Mortars for Plain and Reinforced Unit Masonry; 2020.
Q. ASTM C1019 - Standard Test Method for Sampling and Testing Grout for Masonry; 2020.
R. ASTM C1072 - Standard Test Methods for Measurement of Masonry Flexural Bond Strength; 2019.
S. ASTM C1314 - Standard Test Method for Compressive Strength of Masonry Prisms; 2021.
T. ASTM D1056 - Standard Specification for Flexible Cellular Materials—Sponge or Expanded Rubber; 2020.
U. ASTM D2000 - Standard Classification System for Rubber Products in Automotive Applications; 2018.
V. ASTM E514/E514M - Standard Test Method for Water Penetration and Leakage Through Masonry; 2020.
W. ASTM E518/E518M - Standard Test Methods for Flexural Bond Strength of Masonry; 2021.
X. AWS B2.1/B2.1M - Specification for Welding Procedure and Performance Qualification; 2021.
Y. BIA Technical Notes No. 7 - Water Penetration Resistance – Design and Detailing; 2017.
Z. BIA Technical Notes No. 28B - Brick Veneer/Steel Stud Walls; 2005.
AA. BIA Technical Notes No. 46 - Maintenance of Brick Masonry; 2017.
BB. ICC (IBC) - International Building Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene one week before starting work of this section.
   1. See Section 01 3000 - Administrative Requirements, for meeting procedures.
   2. Coordinate with Section 07 2500 - Weather Barriers for compatibility with Flashing Materials.

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 grout, and integral water-repellent admixtures .
C. Shop Drawings: Indicate bar sizes, spacings, reinforcement quantities, bending and cutting schedules, reinforcement supporting and spacing devices, and accessories.
D. Samples: Submit four samples of each type of masonry unit to illustrate color, texture, and extremes of color range.
E. Welders' Qualification Statement: Welders' certificates in accordance with AWS B2.1/B2.1M and dated no more than 12 months before start of scheduled welding work.
F. Design Data: Indicate required mortar strength, unit assembly strength in each plane, and supporting test data.
G. Manufacturer's Certificate: Certify that masonry units meet or exceed specified requirements.
H. Manufacturer's and Installer's Qualifications.

I. Test Reports: Test reports for each type of building block used are to be submitted to the Architect/Engineer for review. Testing and reports are to be completed by an independent laboratory. Verify that test reports show:
   1. Compressive strength.
   2. 24-hour cold water absorption.
   3. Saturation coefficient.
   4. Initial rate of absorption (suction).

1.06 QUALITY ASSURANCE

A. Comply with provisions of {RS#97}, except where exceeded by requirements of Contract Documents.
   1. Maintain one copy of each document on project site.
B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years of documented experience.
C. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years of documented experience.
D. Welder Qualifications: Welding processes and welding operators qualified in accordance with AWS D1.4/D1.4M and no more than 12 months before start of scheduled welding work.
E. Single-Source Responsibility for Masonry Units: Obtain exposed masonry units of a uniform texture and color, or a uniform blend within the ranges accepted for these characteristics, from one source and by a single manufacturer for each different product required.
F. Single-Source Responsibility for Mortar Materials: Obtain mortar ingredients of a uniform quality, including color for exposed masonry, from one manufacturer for each cementitious component and from one source or producer for each aggregate.

1.07 PRECONSTRUCTION TESTING

A. Testing will be conducted by an independent test agency, in accordance with provisions of Section 01 4000 - Quality Requirements.
B. Clay Masonry: Test each type of clay masonry in accordance with ASTM C67/C67M.
C. Concrete Masonry: Test each type, class, and grade of concrete masonry unit in accordance with ASTM C140/C140M for compliance with requirements of this specification.
D. Mortar Mixes: Test mortars prebatched by weight in accordance with ASTM C780 recommendations for preconstruction testing.
E. Grout Mixes: Test grout batches in accordance with ASTM C1019 procedures.
F. Compressive Strength: Where indicated, test masonry prisms in accordance with ASTM C1314.
   1. Prepare two sets of prisms; test one set at 7 days and the other at 28 days.
   2. Clay masonry prisms: Height-to thickness ration of 5.0.
   3. Concrete masonry prisms: Height-to-thickness ratio of not less than 1.33 and not more than 5.0; apply correction factor per TMS 402/602 for ratio other than 2.0.
G. Flexural Bond Strength: Where indicated, test masonry prisms in accordance with ASTM E518/E518M, with tooled joints downward.
H. Water Permeance of Masonry: Test each type of concrete masonry units in accordance with ASTM E514/E514M for conformance to requirements of this specification.

1.08 REGULATORY REQUIREMENTS

A. Conform to the International Building Code ICC (IBC) for necessary requirements for fire-rated masonry construction.

1.09 MOCK-UP

A. Construct a masonry wall as a mock-up panel sized 8 feet long by 6 feet high; include mortar and accessories, structural backup, reinforcement, grout, flashings, weather barrier, and wall insulation in mock-up.
B. Locate where directed and face south.
C. Mock-up may remain as part of the Work, if undisturbed at time of substantial completion at the discretion of the Architect.

1.10 DELIVERY, STORAGE, AND HANDLING

A. Deliver, handle, and store masonry units by means that will prevent mechanical damage and contamination by other materials.
    1. Store block off ground to prevent contamination by mud, dust or material likely to cause staining or other defects.
    2. Cover materials when necessary to protect from elements.
    3. Protect reinforcement from elements.
    4. Mortar and Grout Materials:
        a. Keep sand dry and protect from freezing.
        b. Store cement and lime off the ground and protect from moisture. In extreme weather, it should be stored in an enclosed space such as a building or trailer.

1.11 FIELD CONDITIONS

A. Cold and Hot Weather Requirements: Comply with requirements of TMS 402/602 or applicable building code, whichever is more stringent.

1.12 GUARANTEE

A. The Contractor shall guarantee his work for a period of One (1) year from date of Substantial Completion. Guarantee shall be on form included in Section 01 7800.

PART 2 PRODUCTS

2.01 MASONRY CONTRACTORS

A. All masonry contractors must be prequalified by CM/GC.

2.02 CONCRETE MASONRY UNITS

A. Concrete Block: Comply with referenced standards and as follows:
    1. Sizes: Standard units with nominal face dimensions of:
        a. 16 inches by 8 inches (400 mm by 200 mm) and nominal depths of 8 and 10 inches.
        b. 8 inches by 8 inches (200 mm by 200 mm) and nominal depths of 8 and 10 inches.
    2. Special Shapes: Provide non-standard blocks configured for corners, lintels, headers, control joint edges, and preformed single and double bullnose/chamfer as indicated on drawings or as required to complete the work.
    3. Load-Bearing Units: ASTM C90, normal, or medium with aggregate conforming to ASTM C331/C331M.
        a. Hollow block, refer to General Structural Notes on Drawings.
        b. Minimum Unit Strength: 2,000 psi.
        c. Admixtures: Integral water repellent admixture.
        d. Exposed Faces: Standard Face, Honed Face, and Split Face units where scheduled on the drawings. Refer to elevations for detail and notation or as directed by Architect.

e. Colors: Colored Honed - custom block mix based on standard color (Confetti) as selected by architect.
   1) Block may be standard grey color where painted or not exposed.

4. Accepted Manufacturers:
   a. Basis of Design Manufacturer:
      1) Sunroc, Orem, UT / St. George, UT: www.sunroc.net.
   b. Other Acceptable Manufacturers:
      1) Amcor, Inc., Salt Lake City, UT: www. amcormasonry.com.
      2) Richfield Block Co., Richfield, UT.
   c. Substitutions: See Section 01 6000 - Product Requirements.

2.03 MORTAR AND GROUT MATERIALS

A. Refer to General Structural Notes on Drawings.
B. Mortar: Type S.
C. Masonry Cement: ASTM C91/C91M .
   1. Colored Mortar: Premixed cement as required to match Architect's color sample.
D. Portland Cement: ASTM C150/C150M, Type I/II; color as required to produce approved color sample.
E. Hydrated Lime: ASTM C207,
F. Mortar Aggregate: ASTM C144.
G. Grout Aggregate: ASTM C404.
H. Water: Clean and potable.
I. Accelerating Admixture: Nonchloride type for use in cold weather.

2.04 ADMIXTURES

A. Water-Repellent Admixture System: Water repellent compound designed to reduce capillarity. <u>For all masonry units, mortar and grout.</u>
   1. Performance Requirements: Masonry units, mortar, and grout shall meet the following requirements:
      a. Water Permeance of Masonry: Use water-repellent admixtures capable of providing masonry assembly performance of no visible dampness on backs of three wall specimens after 72 hours of testing when evaluated using ASTM E514/E514M.
      b. Flexural Bond Strength: ASTM C1072 minimum 10 percent increase compared to reference specimen.
      c. Compressive Strength of Masonry Prisms: ASTM C1314, maximum 5 percent decrease.
      d. Compressive Strength of Masonry Mortar: ASTM C109/C109M, minimum 80 percent measure compared to reference specimen.
      e. Drying Shrinkage of Concrete Masonry Units: Maximum 5 percent increase in shrinkage.
      f. Drying Shrinkage of Masonry Mortar and Grout: ASTM C1148 maximum 5 percent increase in shrinkage when compared to reference specimen.
   2. Acceptable Products:
      a. GCP Applied Technologies, Product - Dry-Block: www.gcpat.com/en-us.
      b. BASF, Product - Rheopel: www.basf-admixtures.com.
      c. Euclid Chemical Co., Product - Eucon Blocktite: www.euclidchemical.com.
      d. Substitutions: See Section 01 6000 - Product Requirements.

2.05 REINFORCEMENT AND ANCHORAGE

A. Manufacturers:

1. Blok-Lok Limited: www.blok-lok.com.
2. Hohmann & Barnard, Inc: www.h-b.com.
3. WIRE-BOND: www.wirebond.com.
4. Halfen Anchoring Systems: www.halfenusa.com.

B. Reinforcing Steel: Type specified in Section 03 2000; size as indicated on drawings; uncoated finish.

2.06 ACCESSORIES

A. Ceramic Fiber Blanket
1. Location: Control joints in fire walls.
2. Temperature Rating: 2,300 degrees Fahrenheit minimum.
3. Density: 8 lbs/cu.
4. Size: 1 inch by 6 inch.

2.07 LINTELS

A. Masonry Lintels: Refer to Structural Drawings.

2.08 MORTAR MIXES

A. Mortar for Unit Masonry: ASTM C270, using the Proportion Specification.
1. Engineered Masonry; Type S.
2. Mortar Strength: Refer to Structural Drawings.
3. Acceptable Manufacturers:
a. Spec Mix: www.specmix.com.
b. Quick Crete Products Corporation: www.quickcrete.com.
c. Substitutions: See Section 01 6000 - Product Requirements.

B. Colored Mortar: Proportion selected pigments and other ingredients to match Architect's sample, without exceeding manufacturer's recommended pigment-to-cement ratio.
1. Mortar Colorant: Shall be only pure mineral oxide and in no case, exceed 10 percent of the weight of the cement.
2. Color shall be as selected by the Architect from manufacturer's full line.
3. Materials shall be chemically inert, finely ground, lime-proof pigment.

C. Use only mortar containing integral water repellent mortar admixture at the manufacturer's recommended addition rate and mixed according to the manufacturer's recommendations.

2.09 MORTAR MIXING

A. Thoroughly mix mortar ingredients using mechanical batch mixer, in accordance with ASTM C270 and in quantities needed for immediate use.
1. Add integral water repellent admixture during mixing in conformance with the admixture label instructions and the recommendations of the manufacturer.

B. Maintain sand uniformly damp immediately before the mixing process.

C. Add mortar color and admixtures in accordance with manufacturer's instructions. Provide uniformity of mix and coloration.

D. Do not use anti-freeze compounds to lower the freezing point of mortar.

E. Retempering of mortar after initial mix is not allowed.

2.10 GROUT MIXES

A. Mix Design: 2,500 psi (19 MPa) strength at 28 days; 8-10 inches (200-250 mm) slump; provide premixed type in accordance with ASTM C 94/C 94M.
1. Use fine grout for spaces with smallest horizontal dimension of 2 inches or less.
2. Use coarse grout for spaces with smallest horizontal dimension greater than 2 inches.

B. Use only grout containing integral water-repellent mortar admixture at the manufacturer's recommended addition rate and mixed according to the manufacturer's recommendations.

2.11 GROUT MIXING

A. Mix grout in accordance with ASTM C94/C94M.
B. Thoroughly mix grout ingredients in quantities needed for immediate use in accordance with ASTM C476 for fine and coarse grout.
C. Add admixtures in accordance with manufacturer's instructions; mix uniformly.
   1. Add integral water repellent admixture during mixing in conformance with the admixture label instructions and the recommendations of the manufacturer.
D. Do not use anti-freeze compounds to lower the freezing point of grout.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that field conditions are acceptable and are ready to receive masonry.
B. Verify that related items provided under other sections are properly sized and located.
C. Verify that built-in items are in proper location, and ready for roughing into masonry work.

3.02 PREPARATION

A. Direct and coordinate placement of metal anchors supplied for installation under other sections.
B. Clean reinforcement of loose rust.
C. Provide temporary bracing during installation of masonry work. Maintain in place until building structure provides permanent bracing.

3.03 COURSING

A. Establish lines, levels, and coursing indicated. Protect from displacement.
B. Maintain masonry courses to uniform dimension. Form vertical and horizontal joints of uniform thickness.
C. Concrete Masonry Units:
   1. Bond: Running.
   2. Coursing: One unit and one mortar joint to equal 8 inches.
   3. Mortar Joints: Concave.
D. Brick Units:
   1. Bond: Running.
   2. Coursing: Three units and three mortar joints to equal 12 inches.
   3. Mortar Joints: Concave.

3.04 PLACING AND BONDING

A. Lay hollow masonry units with face shell bedding on head and bed joints.
B. Buttering corners of joints or excessive furrowing of mortar joints is not permitted.
C. Remove excess mortar as work progresses.
D. Tool all joints with an appropriate sized tool when joints are thumb-print hard.
E. All joints which are concealed by other construction materials and finishes shall be "tooled" (no exceptions).
F. Interlock intersections and external corners, except for units laid in stack bond.
G. Do not shift or tap masonry units after mortar has achieved initial set. Where adjustment must be made, remove mortar and replace.
H. Perform job site cutting of masonry units with proper tools to provide straight, clean, unchipped edges. Prevent broken masonry unit corners or edges.

I. Cut mortar joints flush where wall tile is scheduled, resilient base is scheduled, or bitumen dampproofing is applied.

3.05 REINFORCEMENT AND ANCHORAGE

A. Reinforcement Bars: Secure at locations indicated and to avoid displacement during grouting. Minimum spacing between bars or to masonry surfaces shall be one bar diameter.
   1. Welding of splices is not permitted.
B. Joint Reinforcement: Install horizontal joint reinforcement 16 inches on center.
   1. Place masonry joint reinforcement in first and second horizontal joints above and below openings. Extend minimum 16 inches each side of opening.
   2. Place continuous joint reinforcement in first and second joint below top of walls.
   3. Lap joint reinforcement ends minimum 6 inches.
   4. Refer to Section 04 2001 - Masonry Veneer for wire ties and seismic accessories.
C. Reinforced Brick Masonry: Maintain grout spaces indicated, free of mortar and no less than 6 inches greater than the sum of bar diameters in the grouted space. Provide temporary dams or barriers to control flow of grout at ends of wall sections; remove dams when grout has hardened sufficiently.
D. Reinforced Hollow Unit Masonry: Keep vertical cores to be grouted clear of mortar, including bed area of first course.
   1. Bond Beams: At bond beams or other locations for horizontally reinforced masonry, provide special masonry units or saw to accommodate reinforcement.

3.06 MASONRY FLASHINGS

A. Whether or not specifically indicated, install masonry flashing to divert water to exterior at all locations where downward flow of water will be interrupted.
   1. Extend flashings full width at such interruptions and at least 6 inches, minimum, into adjacent masonry or turn up at least 1 inch, minimum, to form watertight pan at non-masonry construction.
   2. Remove or cover protrusions or sharp edges that could puncture flashings.
   3. Seal lapped ends and penetrations of flashing before covering with mortar.
B. Extend metal flashings through exterior face of masonry and terminate in an angled drip with hemmed edge. Install joint sealer below drip edge to prevent moisture migration under flashing.
C. Lap end joints of flashings at least 6 inches minimum and seal watertight with flashing sealant/adhesive.

3.07 GROUTING

A. Perform all grouting by means of low-lift technique. Do not employ high-lift grouting.
B. Low-Lift Grouting:
   1. Limit height of pours to 48 inches.
   2. Limit height of masonry to 16 inches above each pour.
   3. Pour grout only after vertical reinforcing is in place; place horizontal reinforcing as grout is poured. Prevent displacement of bars as grout is poured.
   4. Place grout for each pour continuously and consolidate immediately; do not interrupt pours for more than 1 1/2 hours.

3.08 CONTROL AND EXPANSION JOINTS

A. Do not continue horizontal joint reinforcement through control or expansion joints.
B. Install preformed control joint device in continuous lengths. Seal butt and corner joints in accordance with manufacturer's instructions.
C. Form expansion joint as detailed and as located on Drawings.

D. This Contractor shall coordinate locations of joints with structural columns, masonry layout, and suggested joint layout on the drawings, including those that extend to upper floor levels.
   1. Maximum spacing shall be 30 feet (9.1 m) on center, unless approved by the Architect, and preferred spacing of 24 feet (7.3 m) to 28 feet (8.5 m) on center.

3.09 BUILT-IN WORK

A. Build into new masonry, all bolts, bearing plates, anchors, nailing blocks, inserts, lintels, etc. indicated on the contract drawings, as furnished by the structural and miscellaneous steel subcontractor specified in Sections 05 1200 and 05 5000.
B. As work progresses, install built-in metal door frames, lintels, glazed frames, lintels, fabricated metal frames, lintels, anchor bolts, lintels, plates, lintels, and lintels and other items to be built into the work and furnished under other sections.
C. Install built-in items plumb, level, and true to line.
D. Bed anchors of metal door and glazed frames in adjacent mortar joints. Fill frame voids solid with grout.
   1. Fill adjacent masonry cores with grout minimum 12 inches from framed openings.
E. Do not build into masonry construction organic materials that are subject to deterioration.

3.10 TOLERANCES

A. Maximum Variation from Alignment of Columns: 1/4 inch.
B. Maximum Variation from Unit to Adjacent Unit: 1/16 inch.
C. Maximum Variation from Plane of Wall: 1/4 inch in 10 feet and 1/2 inch in 20 feet or more.
D. Maximum Variation from Plumb: 1/4 inch per story non-cumulative; 1/2 inch in two stories or more.
E. Maximum Variation from Level Coursing: 1/8 inch in 3 feet and 1/4 inch in 10 feet; 1/2 inch in 30 feet.
F. Maximum Variation of Joint Thickness: 1/8 inch in 3 ft.
G. Maximum Variation from Cross Sectional Thickness of Walls: 1/4 inch.

3.11 CUTTING AND FITTING

A. Cut and fit for chases, pipes, conduit, sleeves, and grounds. Coordinate with other sections of work to provide correct size, shape, and location.
B. Obtain approval prior to cutting or fitting masonry work not indicated or where appearance or strength of masonry work may be impaired.

3.12 FIELD QUALITY CONTROL

A. An independent testing agency will perform field quality control tests, as specified in Section 01 4000 - Quality Requirements.
B. Clay Masonry Unit Tests: Test each variety of clay masonry in accordance with ASTM C67/C67M requirements, sampling 5 randomly chosen units for each 50,000 installed.
C. Concrete Masonry Unit Tests: Test each variety of concrete unit masonry in accordance with ASTM C140/C140M for compliance with requirements of this specification.
D. Mortar Tests: Test each type of mortar in accordance with recommended procedures in ASTM C780, testing with same frequency as masonry samples.
E. Test and evaluate grout in accordance with ASTM C1019 procedures.
   1. Test with same frequency as specified for masonry units.
F. Prism Tests: Test masonry and mortar panels for compressive strength in accordance with ASTM C1314 and for flexural bond strength in accordance with ASTM C1072 or ASTM E518/E518M; perform tests and evaluate results.

3.13 CLEANING

A. Remove excess mortar and mortar smears as work progresses.
B. Replace defective mortar. Match adjacent work.
C. Follow block manufacturer's recommendations for cleaning.
D. Thoroughly wet surface of masonry on which no green efflorescence appears.
E. Immediately rinse with clear water.
F. Do small sections at a time.
G. Work from top to bottom.
H. Use non-metallic tools in cleaning operations.
I. Protect all sash, metal lintels and other corrodible parts when masonry is cleaned with acid solution.
J. Remove white or green efflorescence in accordance with block manufacturer's recommendations.
K. Adjust pressure of washers so as not to "pock", sandblast or otherwise damage faces of masonry units. All units damaged in such manner shall be removed and replaced by the masonry contractor at no expense to the Owner.

3.14 PROTECTION

A. Without damaging completed work, provide protective boards at exposed external corners that are subject to damage by construction activities.
B. Protection of Masonry Method:
    1. Wall Covering:
        a. During erection, and after completion, cover top of all walls with strong waterproof membrane.
        b. Extend cover minimum of 24 inches (610 mm) down both sides.
        c. Hold cover securely in place and maintain throughout construction until all walls are covered with roofing membrane and/or cap flashings.
C. Staining:
    1. Prevent grout or mortar from staining the face of masonry to be left exposed or painted:
        a. Immediately remove grout or mortar in contact with face of such masonry.
        b. Protect all sills, ledges and projections from droppings of mortar, protect door jambs and corners from damage during construction.
D. Cold Weather Protection:
    1. Preparation:
        a. If ice or snow has formed on masonry bed, remove by carefully applying heat until top surface is dry to the touch.
        b. Remove all frozen or damaged masonry.
    2. When brick suction exceeds recommendations, sprinkle with heated water:
        a. When units are above 32 degrees F, heat water above 70 degrees F.
        b. When units are below 32 degrees F, heat water above 130 degrees F.
    3. Use dry masonry units.
    4. Do not use wet or frozen units.
E. Construction Requirements While Work is Progressing:
    1. Air Temperature 40 degrees F to 32 degrees F:
        a. Heat sand or mixing water to produce mortar temperatures between 40 degrees F and 120 degrees F.
        b. Cover walls and materials to prevent wetting and freezing. Covers should be plastic or canvas.
    2. Air Temperature 32 degrees F to 25 degrees F:

a. Heat sand and mixing water to produce mortar temperatures between 40 degrees F and 120 degrees F.
b. Maintain temperatures of mortar on boards above freezing.
c. With wind velocities over 15 mph, provide windbreaks during the workday and cover walls and materials at the end of the day to prevent wetting and freezing.
d. Maintain masonry above freezing for 16 hours using auxiliary heat or insulated blankets.
e. Heat grout materials to 90 degrees F to produce in-place grout temperature of 70 degrees F at end of work day.

3. Air Temperature 25 degrees F to 2 degrees F:
   a. Heat sand and mixing water to produce mortar temperatures between 40 degrees F and 120 degrees F.
   b. Maintain mortar temperatures on boards above freezing.
   c. Use salamanders or other heat sources on both sides of walls under construction.
   d. Use windbreaks when wind is in excess of 15 mph.
   e. Heat grout materials to 90 degrees F to produce in-place grout temperature of 70 degrees F at end of work day.
4. Air Temperature 20 degrees F and Below:
   a. Heat sand and mixing water to produce mortar temperatures between 40 degrees F and 120 degrees F.
   b. Provide enclosures and auxiliary heat to maintain air temperature above 32 degrees F.
   c. Minimum temp. of units when laid: _____ degrees F.
   d. Heat grout materials to 90 degrees F to produce in-place grout temperature of 70 degrees F at end of work day.

F. Protection Requirements for Completed Masonry and Masonry Not Being Worked On:
1. Minimum air temperature 40 degrees F to 32 degrees F:
   a. Refer to paragraph 3.14-B.
2. Mimimum air temperature 32 degrees F to 25 degrees F:
   a. Refer to paragraph 3.14-B.
3. Minimum air temperature 25 degrees F to 20 degrees F:
   a. Completely cover masonry with insulating blankets or equal protection for 24 hours, 48 hours for grouted masonry.
   b. Refer to paragraph 3.14-B.
4. Minimum air temperature 20 degrees F and below:
   a. Maintain masonry temperature above 32 degrees F for 24 hours by:
      1) Enclosure and supplementary heat,
      2) Electric heating blankets,
      3) Infrared lamps,
      4) Or other methods acceptable to the Architect/Engineer.
   b. Refer to paragraph 3.14-B.

END OF SECTION 04 2731

This page intentionally left blank

SECTION 05 1200

STRUCTURAL STEEL FRAMING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Furnish all labor, materials, equipment, tools, and services required to fully complete all Structural Steel Framing work as is indicated on the drawings and/or specified herein including, but not limited to, the following described items.
B. Wide flange steel beams and bearing plates complete with all bolts, nut, washers, headed studs for roof and floor structures. See details on structural drawings.
   1. Galvanized at exterior conditions.
C. Steel tube columns with base and cap plates, rods, bolts, nuts and washers for roof, floor and canopy structures. See details on drawings.
   1. Galvanized at exterior conditions.
D. All miscellaneous steel channels, tubes, angles, plates, bent plates, rods, nuts, bolts, washers, and headed stud anchors required for roof, floor, stair, exterior canopy, catwalk system, fly loft system, and miscellaneous wall support and framing. See details on drawings.
   1. Galvanized at exterior conditions.
E. Anchor rods incorporated in structure as shown on drawings.
F. All required plates, channels, angles, rods, bolts, etc. cast into concrete tilt-up wall panels.
   1. Galvanized at below grade conditions.
G. Structural steel framing members.
H. Structural steel support members, suspension cables, sag rods, and struts.
I. Base plates, shear stud connectors and expansion joint plates.
J. Grouting under base plates.
K. Do not include sales tax, refer to Section 00 1115 - Advertisement for Prequalification of Bidders.

1.02 RELATED REQUIREMENTS

A. Section 05 2100 - Steel Joist Framing.
B. Section 05 3100 - Steel Decking: Support framing for small openings in deck.
C. Section 05 4000 - Cold-Formed Metal Framing.
D. Section 05 5000 - Metal Fabrications: Steel fabrications affecting structural steel work.

1.03 REFERENCE STANDARDS

A. AISC (MAN) - Steel Construction Manual; 2017.
B. AISC 303 - Code of Standard Practice for Steel Buildings and Bridges; 2016.
C. AISC 201 - AISC Certification Program for Structural Steel Fabricators, Standard for Steel Building Structures; 2006.
D. AISC 207 - Certification Standard for Steel Fabrication and Erection, and Manufacturing of Metal Components; 2016.
E. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2019.
F. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless; 2020.
G. ASTM A108 - Standard Specification for Steel Bar, Carbon and Alloy, Cold-Finished; 2018.
H. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2017.

I. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2016a.
J. ASTM A242/A242M - Standard Specification for High-Strength Low-Alloy Structural Steel; 2013 (Reapproved 2018).
K. ASTM A307 - Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength; 2021.
L. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes; 2021a.
M. ASTM A501/A501M - Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing; 2021.
N. ASTM A514/A514M - Standard Specification for High-Yield-Strength, Quenched and Tempered Alloy Steel Plate, Suitable for Welding; 2018, with Editorial Revision (2019).
O. ASTM A529/A529M - Standard Specification for High-Strength Carbon-Manganese Steel of Structural Quality; 2019.
P. ASTM A563/A563M - Standard Specification for Carbon and Alloy Steel Nuts (Inch and Metric); 2021a.
Q. ASTM A572/A572M - Standard Specification for High-Strength Low-Alloy Columbium-Vanadium Structural Steel; 2021, with Editorial Revision.
R. ASTM A992/A992M - Standard Specification for Structural Steel Shapes; 2020.
S. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Required Hardness, Solution Hardened, and Bake Hardenable; 2021a.
T. ASTM A1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength; 2018a.
U. ASTM C827/C827M - Standard Test Method for Change in Height at Early Ages of Cylindrical Specimens of Cementitious Mixtures; 2016.
V. ASTM E94/E94M - Standard Guide for Radiographic Examination Using Industrial Radiographic Film; 2017.
W. ASTM E164 - Standard Practice for Contact Ultrasonic Testing of Weldments; 2019.
X. ASTM E165/E165M - Standard Practice for Liquid Penetrant Testing for General Industry; 2018.
Y. ASTM E709 - Standard Guide for Magnetic Particle Testing; 2021.
Z. ASTM F436/F436M - Standard Specification for Hardened Steel Washers Inch and Metric Dimensions; 2019.
AA. ASTM F959/F959M - Standard Specification for Compressible-Washer-Type Direct Tension Indicators for Use with Structural Fasteners, Inch and Metric Series; 2017a.
BB. ASTM F1554 - Standard Specification for Anchor Bolts, Steel, 36, 55, and 105-ksi Yield Strength; 2020.
CC. ASTM F3125/F3125M - Standard Specification for High Strength Structural Bolts and Assemblies, Steel and Alloy Steel, Heat Treated, Inch Dimensions 120 ksi and 150 ksi Minimum Tensile Strength, and Metric Dimensions 830 MPa and 1040 MPa Minimum Tensile Strength; 2021.
DD. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination; 2020.
EE. AWS B2.1/B2.1M - Specification for Welding Procedure and Performance Qualification; 2021.
FF. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2020, with Errata (2021).
GG. IAS AC172 - Accreditation Criteria for Fabricator Inspection Programs for Structural Steel AC172; 2019.
HH. RCSC (HSBOLT) - Specification for Structural Joints Using High-Strength Bolts; Research Council on Structural Connections; 2020.
II. SSPC-Paint 15 - Steel Joist Shop Primer/Metal Building Primer; 2004.

JJ. SSPC-Paint 20 - Zinc-Rich Coating (Type I - Inorganic, and Type II - Organic); 2019.
KK. SSPC-SP 3 - Power Tool Cleaning; 2018.
LL. SSPC-SP 6 - Commercial Blast Cleaning; 2007.

1.04 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.
   3. Indicate cambers and loads.
   4. Indicate welded connections with AWS A2.4 welding symbols. Indicate net weld lengths.
C. Verify conditions at site affecting work of this Section and obtain accurate field dimensions. Report discrepancies between drawings and field dimensions to the Architect prior to commencing work.
D. Manufacturer's Mill Certificate: Certify that products meet or exceed specified requirements.
E. Mill Test Reports: Indicate structural strength, destructive test analysis and non-destructive test analysis.
F. Materials Test Reports: Submit independent test results or engineered performance analysis of structural thermal-break pad performance in bearing or slip-critical connections where shear and moment loads are applied.
G. Welders' Qualification Statement: Welders' certificates in accordance with AWS B2.1/B2.1M and dated no more than 12 months before start of scheduled welding work.
H. Designer's Qualification Statement.
I. Fabricator's Qualification Statement: Provide documentation showing steel fabricator is accredited under IAS AC172 or AISC 201
J. Responsibility: The Contractor shall, alone, be responsible for the correctness of all shop drawings and for all shop and field fabrication. The review or comments on any drawings shall not relieve the Contractor of any responsibility for the correctness of the details. The Architect's review covers general design of details only and if any corrections are made which would cause members not to fit or would not give sufficient strength, the Contractor shall call the Architect's attention to it at once in writing so that corrections can be made. If the Contractor fails to do this, the sole responsibility rests upon him.
K. Omission of any material from the Contractor's shop drawings that is shown on the working drawings or called for in the specification, shall not relieve the Contractor from furnishing such material, even though the Architect/Engineer reviewed the Contractor's shop drawings.

1.05 QUALITY ASSURANCE

A. Fabricate structural steel members in accordance with AISC (MAN) Steel Construction Manual.
B. Structural steel members designated as architecturally-exposed structural steel (AESS) to also comply with Section 05 1213.
C. Maintain one copy of each document on site.
D. Fabricator: Company specializing in performing the work of this section with minimum 5 years of documented experience.
E. Welder Qualifications: Welding processes and welding operators qualified in accordance with AWS D1.1/D1.1M and no more than 12 months before start of scheduled welding work.
F. 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 or AISC 201
G. Erector: Company specializing in performing the work of this section with minimum 5 years of documented experience.

H. Design connections not detailed on drawings under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed in the State in which the Project is located.

I. Welder, Tacker and Welding Operator Qualifications: Welds shall be made only by welders, tackers, and welding operators who have been previously qualified by tests as prescribed in the Code for Welding in Building Construction, AWS D1.1/D1.1M, latest edition, of the American Welding Society to perform the type of work required. All welding shall be in accordance with AWS D1.1, latest edition, of the American Welding Society to perform the type of work required.

1.06 GUARANTEE

A. The Contractor shall guarantee his work for a period of one (1) year from date of Substantial Completion. Guarantee shall be on form included in Section 01 7800.

PART 2 PRODUCTS

2.01 REGULATORY REQUIREMENTS

2.02 MATERIALS

A. Steel Plates, other Shapes, and other Shapes: ASTM A36/A36M.
B. Steel W Shapes and Tees: ASTM A992/A992M.
C. Rolled Steel Structural Shapes: ASTM A992/A992M.
D. Steel Shapes, Plates, and Bars: ASTM A242/A242M high-strength, corrosion-resistant structural steel.
E. Steel Bars: ASTM A529/A529M high-strength, carbon-manganese structural steel, Grade 50.
F. Steel Plates and Bars: ASTM A572/A572M, Grade 50 (345) high-strength, columbium-vanadium steel.
G. Cold-Formed Structural Tubing: ASTM A500/A500M, Grade C.
H. Hot-Formed Structural Tubing: ASTM A501/A501M, seamless or welded.
I. Steel Bars: ASTM A108Grade 1018.
J. Steel Plate: ASTM A514/A514M.
K. Steel Sheet: ASTM A1011/A1011M, Designation SS, Grade 30 hot-rolled, or ASTM A1008/A1008M, Designation SS, Grade 30 cold-rolled.
L. Pipe: ASTM A53/A53M, Grade B, Finish black.
M. Shear Stud Connectors: Made from ASTM A108 Grade 1015 bars.
N. Sag Rods: ASTM A36/A36M.
O. All-thread rod: ASTM A36/A36M
P. Structural Bolts and Nuts: Carbon steel, ASTM A307, Grade A and galvanized in compliance with ASTM A153/A153M Class C.
Q. High-Strength Structural Bolts, Nuts, and Washers: ASTM F3125/F3125M, Type 1, with matching compatible ASTM A563/A563M nuts and ASTM F436/F436M washers.
    1. Galvanized or zinc coated where used with chemically treated wood plates, coordinate with Section 06 1000.
R. Anchor Rods: ASTM F1554, Grade 36 (Grade 55 where specifically noted in the drawings), plain, with matching ASTM A563 or ASTM A563M nuts and ASTM F436 Type 1 washers.
S. Headed Anchor Rods: ASTM F1554 Grade 36, plain.
T. Load Indicator Washers: Provide washers complying with ASTM F959/F959M at connections requiring high-strength bolts.
U. Welding Materials: AWS D1.1/D1.1M; type required for materials being welded.
V. 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.

2. Minimum Compressive Strength at 28 Days: 7,000 pounds per square inch.
3. Height Change, Plastic State; when tested according to ASTM C827/C827M:
    a. Maximum: Plus 4 percent.
    b. Minimum: Plus 1 percent.
4. Manufacturers
    a. W.R. Meadows: www.wrmeadows.com.
    b. L & M Construction chemicals, Inc.: www.lmcc.com.
    c. US Spec: www.uspec.com.
    d. Substitutions: See Section 01 6000 - Product Requirements.

W. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.

X. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20 Type I - Inorganic, complying with VOC limitations of authorities having jurisdiction.

2.03 FABRICATION

A. Water Absorption: 0.5 percent by volume, maximum.
B. Shop fabricate to greatest extent possible.
C. Space shear stud connections as indicated on Structural Drawings.
D. Continuously seal joined members by continuous welds. Grind exposed welds smooth.
E. Fabricate connections for bolt, nut, and washer connectors.
F. Develop required camber for members.

2.04 SHOP PRIMING

A. Shop prime structural steel members, except the following:
    1. Surfaces embedded in concrete or mortar. Extend priming of partially embedded members to a depth of 2 inches.
    2. Surfaces to be field welded.
    3. Surfaces to be high-strength bolted with slip-critical connections, if primer does not meet the specified AISC slip coefficient.
    4. Surfaces to be fireproofed.
B. Surface Preparation: Clean surfaces to be painted. Remove loose rust, loose mill scale, and spatter, slag, or flux deposits. Prepare surfaces according to SSPC Specifications as follows:
    1. Galvanized Conditions:
        a. SSPC-SP 6 - Commercial Blast Cleaning.
    2. Interior Conditions:
        a. SSPC-SP 3 - Power Tool Cleaning.
C. Priming: Immediately after surface preparation, apply primer according to manufacturer's instructions to provide a dry film thickness of not less than 1.5 mils (0.038 mm). Use priming methods that result in full coverage of joints, corners, edges, and exposed surfaces.
D. Stripe paint corners, crevices, bolts, welds, and sharp edges.
E. Apply two coats of shop primer to surfaces that are inaccessible after assembly or erection.

2.05 FINISH

A. Prepare structural component surfaces in accordance with SSPC-SP 6.
B. Shop prime structural steel members (unless noted to be galvanized). Do not prime surfaces that will be fireproofed, field welded, in contact with concrete, or high strength bolted.
C. Galvanize structural steel members at exterior conditions to comply with ASTM A123/A123M. Provide minimum 1.7 oz/sq ft galvanized coating.

2.06 SOURCE QUALITY CONTROL

A. High-Strength Bolts: Provide testing and verification of shop-bolted connections in accordance with RCSC (HSBOLT) Specification for Structural Joints Using High-Strength Bolts, testing at least 10 percent of bolts at each connection.
B. Welded Connections: Visually inspect all shop-welded connections and test at least 10 percent of welds using one of the following:
   1. Radiographic testing performed in accordance with ASTM E94/E94M.
   2. Ultrasonic testing performed in accordance with ASTM E164.
   3. Liquid penetrant inspection performed in accordance with ASTM E165/E165M.
   4. Magnetic particle inspection performed in accordance with ASTM E709.

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 and Structural Engineer.
F. After erection, prime welds, abrasions, and surfaces not shop primed or galvanized, except surfaces to be in contact with concrete.

3.03 GROUTING AND DRY-PACKING

A. Provide grouting and dry-packing of base plates, leveling plates, and all other like work indicated or required, except where specified for work of other trades. Use non-shrink grout for base plates, leveling plates, and steel columns.
B. Proportions and Mixing:
   1. Non-Shrink Grout: Shall be mixed with water to dry-pack or grout consistency as required.
C. Placing and Finishing: Place by forcing and rodding to completely fill all voids, for complete uniform bearing under plates. Finish exposed surfaces neatly with smooth finish and cure with damp burlap at least three (3) days.
D. 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.

3.04 TOLERANCES

A. Maximum Variation From Plumb: 1/4 inch per story, non-cumulative.
B. Maximum Offset From True Alignment: 1/4 inch.

3.05 FIELD QUALITY CONTROL

A. An independent testing agency will perform field quality control tests, as specified in Section 01 4000 - Quality Requirements.
B. High-Strength Bolts: Provide testing and verification of field-bolted connections in accordance with RCSC "Specification for Structural Joints Using High-Strength Bolts," testing at least 10 percent of bolts at each connection.
C. Welded Connections: Visually inspect all field-welded connections and test at least 10 percent of welds using one of the following:
    1. Radiographic testing performed in accordance with ASTM E94/E94M.
    2. Ultrasonic testing performed in accordance with ASTM E164.
    3. Liquid penetrant inspection performed in accordance with ASTM E165/E165M.
    4. Magnetic particle inspection performed in accordance with ASTM E709.

END OF SECTION 05 1200

This page intentionally left blank

SECTION 05 2100

STEEL JOIST FRAMING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Furnish all labor, materials, equipment, tools and services required to fully complete all Steel Joist Framing work as is indicated on the drawings and/or specified herein including, but not limited to, the following described items.
B. Open web steel joists and girders with bridging, attached seats and anchors.
C. Loose bearing members, such as plates or angles, and anchor bolts for site placement.
D. Supplementary framing for floor and roof openings greater than 12 inches.
E. Do not include sales tax, refer to Section 00 1115 - Advertisement for Prequalification of Bidders.

1.02 RELATED REQUIREMENTS

A. Section 03 3000 - Cast-in-Place Concrete: Placement of anchors for casting into concrete.
B. Section 04 2731 - Engineered Unit Masonry: Placement of anchors for embedding into masonry.
C. Section 05 1200 - Structural Steel Framing: Grouting base plates and bearing plates.
D. Section 05 1200 - Structural Steel Framing: Superstructure framing.
E. Section 05 3100 - Steel Decking: Bearing plates and angles.
F. Section 05 3100 - Steel Decking: Support framing for openings less than 18 inches in decking.
G. Section 05 5000 - Metal Fabrications: Non-framing steel fabrications attached to joists.
H. Section 07 8100 - Applied Fire Protection: Fireproof protection of joist framing and metal deck systems.

1.03 REFERENCE STANDARDS

A. AISC 201 - AISC Certification Program for Structural Steel Fabricators, Standard for Steel Building Structures; 2006.
B. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2019.
C. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2017.
D. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2016a.
E. ASTM A307 - Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength; 2021.
F. ASTM A563/A563M - Standard Specification for Carbon and Alloy Steel Nuts (Inch and Metric); 2021a.
G. ASTM E94/E94M - Standard Guide for Radiographic Examination Using Industrial Radiographic Film; 2017.
H. ASTM E164 - Standard Practice for Contact Ultrasonic Testing of Weldments; 2019.
I. ASTM E165/E165M - Standard Practice for Liquid Penetrant Testing for General Industry; 2018.
J. ASTM E709 - Standard Guide for Magnetic Particle Testing; 2021.
K. ASTM F436/F436M - Standard Specification for Hardened Steel Washers Inch and Metric Dimensions; 2019.

L. ASTM F3125/F3125M - Standard Specification for High Strength Structural Bolts and Assemblies, Steel and Alloy Steel, Heat Treated, Inch Dimensions 120 ksi and 150 ksi Minimum Tensile Strength, and Metric Dimensions 830 MPa and 1040 MPa Minimum Tensile Strength; 2021.
M. AWS B2.1/B2.1M - Specification for Welding Procedure and Performance Qualification; 2021.
N. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2020, with Errata (2021).
O. IAS AC172 - Accreditation Criteria for Fabricator Inspection Programs for Structural Steel AC172; 2019.
P. RCSC (HSBOLT) - Specification for Structural Joints Using High-Strength Bolts; Research Council on Structural Connections; 2020.
Q. SJI 100 - Standard Specifications for K-Series, LH-Series, and DLH-Series Open Web Steel Joists, and for Joist Girders; 2020.
R. SJI Technical Digest No. 9 - Handling and Erection of Steel Joists and Joist Girders; 2008.
S. SSPC-Paint 15 - Steel Joist Shop Primer/Metal Building Primer; 2004.
T. SSPC-Paint 20 - Zinc-Rich Coating (Type I - Inorganic, and Type II - Organic); 2019.
U. SSPC-SP 3 - Power Tool Cleaning; 2018.
V. SSPC-SP 6 - Commercial Blast Cleaning; 2007.

1.04 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' Qualification Statement: Welders' certificates in accordance with AWS B2.1/B2.1M and dated no more than 12 months before start of scheduled welding work.
D. Designer's Qualification Statement.
E. Manufacturer's Qualification Statement: Provide documentation showing steel fabricator is accredited under IAS AC172 or AISC 201.
F. Fabricator's Qualification Statement.
G. Erector's Qualification Statement.

1.05 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 the State in which the Project is located.
B. Perform Work, including that for headers and other supplementary framing, in accordance with SJI 100 Standard Specifications Load Tables and SJI Technical Digest No. 9.
C. Design and Installation Requirements: Refer to Structural Drawings.
D. Manufacturer Qualifications: Company specializing in performing the work of this section with minimum 3 years of documented experience.
E. Welder Qualifications: Welding processes and welding operators qualified in accordance with AWS D1.1/D1.1M and dated no more than 12 months before start of scheduled welding work.
F. 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 or AISC 201.
G. Erector Qualifications: Company specializing in performing the work of this section with minimum 3 years of documented experience.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Transport, handle, store, and protect products to SJI Technical Digest No. 9 requirements.

1.07 GUARANTEE

A. The Contractor shall guarantee his work for a period of One (1) yearfrom date of Substantial Completion. Include guarantee on form in Section 01 7800.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Steel Joists:
   1. Canam Group Inc: www.canam-construction.com.
   2. Nucor-Vulcraft Group: www.vulcraft.com.
   3. CMC Joist: www.cmcjoist.com.
   4. Valley Joist, Inc.: www.valleyjoist.com.
   5. Substitutions: See Section 01 6000 - Product Requirements.

2.02 MATERIALS

A. Open Web Joists: SJI Type K Joists:
   1. Provide bottom chord extensions as indicated.
   2. Minimum End Bearing on Steel Supports: 5 inch
   3. Minimum End Bearing on Concrete or Masonry Supports: 4 inches.
   4. Finish: Shop primed.

B. Open Web Joists: SJI 100 Type LH Joists:
   1. Provide bottom chord extensions as indicated.
   2. Minimum End Bearing on Steel Supports: Comply with referenced SJI standards.
   3. Minimum End Bearing on Masonry or Concrete Supports: Comply with referenced SJI standards.
   4. Finish: Shop primed.

C. Open Web Joists: SJI 100 Type DLH Joists:
   1. Provide bottom chord extensions as indicated.
   2. Minimum End Bearing on Steel Supports: Comply with referenced SJI standards.
   3. Minimum End Bearing on Masonry or Concrete Supports: Comply with referenced SJI standards.
   4. Finish: Shop primed.

D. Anchor Bolts, Nuts and Washers: ASTM A307 hot-dip galvanized per ASTM A153/A153M Class C.

E. High-Strength Structural Bolts, Nuts, and Washers: ASTM F3125/F3125M, Type 1, with matching compatible ASTM A563/A563M nuts and ASTM F436/F436M washers.

F. Tension Control Bolts: Twist-off type; ASTM F3125/F3125M.

G. Structural Steel For Supplementary Framing and Joist Leg Extensions: ASTM A36/A36M.

H. Welding Materials: AWS D1.1/D1.1M; type required for materials being welded.

I. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.

J. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20 Type I - Inorganic, complying with VOC limitations of authorities having jurisdiction.

2.03 FABRICATION

A. Frame special sized openings in joist web framing as detailed.

B. Space stud shear connectors on top of top chords as shown on Structural Drawings.

2.04 FINISH

A. Shop prime joists or Galvanize joists as indicated on drawings.

1. Do not prime surfaces that will be fireproofed, field welded, or in contact with concrete.
2. Galvanize steel ledge angles and anchors to secure joists.
3. For joists in exposed areas, dip joists upside down.

B. Surface Preparation: Clean surfaces to be painted. Remove loose rust, loose mill scale, and spatter, slag, or flux deposits. Prepare surfaces according to SSPC Specifications as follows:
   1. Galvanized Conditions:
      a. SSPC-SP 6 - Commercial Blast Cleaning.
   2. Interior Conditions:
      a. SSPC-SP 3 - Power Tool Cleaning.

C. Priming: Immediately after surface preparation, apply primer according to manufacturer's instructions to provide a dry film thickness of not less than 1.5 mils (0.038 mm). Use priming methods that result in full coverage of joints, corners, edges, and exposed surfaces.

D. Stripe paint corners, crevices, bolts, welds, and sharp edges.

E. Apply two coats of shop primer to surfaces that are inaccessible after assembly or erection.

F. Prepare surfaces to be finished in accordance with SSPC-SP 3.

G. Galvanizing: Where indicated on Drawings, provide minimum 1.7 oz/sq ft galvanized coating to ASTM A123/A123M requirements.

2.05 SOURCE QUALITY CONTROL

A. Provide shop testing of steel components as follows:
   1. As required by SJI Standards.

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 floor and roof openings greater than 12 inches.

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.

J. After the erection is complete, all structural steel is to be reviewed by the Architect and/or Structural Engineer.

3.03 TOLERANCES

A. Maximum Variation From Plumb: 1/4 inch.

B. Maximum Offset From True Alignment: 1/4 inch.

3.04 FIELD QUALITY CONTROL

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

B. High-Strength Bolts: Provide testing and verification of field-bolted connections in accordance with RCSC Specification for Structural Joints Using High-Strength Bolts, testing at least 10 percent of bolts at each connection.

C. Welded Connections: Visually inspect all field-welded connections and test at least 10 percent of welds usingone of the following:
   1. Radiographic testing performed in accordance with ASTM E94/E94M.
   2. Ultrasonic testing performed in accordance with ASTM E164.
   3. Liquid penetrant inspection performed in accordance with ASTM E165/E165M.
   4. Magnetic particle inspection performed in accordance with ASTM E709.

END OF SECTION 05 2100

This page intentionally left blank

SECTION 05 3100

STEEL DECKING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Furnish all labor, materials, equipment, tools and services required to fully complete all Steel Decking work as is indicated on the drawings and/or specified herein including, but not limited to, the following described items.
B. Acoustical roof deck (gymnasiums).
C. Roof deck.
D. Composite floor deck.
E. Supplementary framing for openings up to and including 12 inches.
F. Stud shear connectors.
G. Acoustical insulation in roof deck flutes.
H. Do not include sales tax, refer to Section 00 1115 - Advertisement for Prequalification of Bidders.

1.02 RELATED REQUIREMENTS

A. Section 03 2000 - Reinforcing.
B. Section 03 3000 - Cast-in-Place Concrete: Concrete topping over metal deck.
C. Section 04 2731 - Engineered Unit Masonry: Placement of anchors for bearing plates embedded in reinforced unit masonry.
D. Section 05 1200 - Structural Steel Framing: Support framing for openings larger than 18 inches and shear stud connectors.
E. Section 05 1200 - Structural Steel Framing: Placement of embedded steel anchors for bearing plates in cast-in-place concrete.
F. Section 05 2100 - Steel Joist Framing: Support framing for openings larger than 18 inches and shear stud connectors.
G. Section 05 2100 - Steel Joist Framing: Placement of embedded steel anchors for bearing plates and joist seats in cast-in-place concrete.
H. Section 05 3400 - Acoustical Metal Decking
I. Section 05 5000 - Metal Fabrications: Steel angle concrete stops at deck edges.
J. Division 22 - Plumbing: Reinforcement pans with drain hub assemblies.
K. Section 07 8100 - Applied Fire Protection: Spray applied fireproofing.
L. Division 26 - Electrical: Electrical, telephone, data floor outlets, sleeves, gaskets, raceway, and covers.

1.03 REFERENCE STANDARDS

A. AISC 201 - AISC Certification Program for Structural Steel Fabricators, Standard for Steel Building Structures; 2006.
B. ASTM A108 - Standard Specification for Steel Bar, Carbon and Alloy, Cold-Finished; 2018.
C. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2022.
D. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Required Hardness, Solution Hardened, and Bake Hardenable; 2021a.
E. AWS B2.1/B2.1M - Specification for Welding Procedure and Performance Qualification; 2021.
F. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2020, with Errata (2021).

G. AWS D1.3/D1.3M - Structural Welding Code - Sheet Steel; 2018.
H. IAS AC172 - Accreditation Criteria for Fabricator Inspection Programs for Structural Steel AC172; 2019.
I. SDI (DM) - Publication No.30, Design Manual for Composite Decks, Form Decks, and Roof Decks; 2007.
J. SSPC-Paint 15 - Steel Joist Shop Primer/Metal Building Primer; 2004.
K. SSPC-Paint 20 - Zinc-Rich Coating (Type I - Inorganic, and Type II - Organic); 2019.
L. SSPC-SP 3 - Power Tool Cleaning; 2018.
M. SSPC-SP 6 - Commercial Blast Cleaning; 2007.
N. UL (FRD) - Fire Resistance Directory; Current Edition.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittals procedures.
B. Product Data: Provide deck profile characteristics, dimensions, structural properties, and finishes.
C. Shop Drawings: Indicate deck plan, support locations, projections, openings, reinforcement, pertinent details, and accessories.
D. Certificates: Certify that products furnished meet or exceed specified requirements.
E. Submit manufacturer's installation instructions.
F. Welders' Qualification Statement: Welders' certificates in accordance with AWS B2.1/B2.1M and dated no more than 12 months before start of scheduled welding work.
G. Designer's Qualification Statement.
H. Fabricator's Qualification Statement: Provide documentation showing steel fabricator is accredited under IAS AC172 or AISC 201

1.05 QUALITY ASSURANCE

A. Design deck layout, spans, fastening, and joints under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed in the State in which the Project is located.
B. Welder Qualifications: Welding processes and welding operators qualified in accordance with AWS D1.1/D1.1M and AWS D1.3/D1.3M and dated no more than 12 months before start of scheduled welding work.
C. 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 or AISC 201
D. Installer Qualifications: Company specializing in performing the work of this Section with minimum Five 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.

1.07 GUARANTEE

A. The Contractor shall guarantee his work for a period of One (1) year from date of Substantial Completion. Guarantee shall be on form included in Section 01 7800.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Steel Deck:
    1. Canam Steel Corporation: https://www.canam-construction.com.

2. Nucor-Vulcraft Group: www.vulcraft.com.
3. New Millennium: www.newmill.com
4. ASC Steel Deck: www. ascsd.com.
5. Valley Joist, Inc.: www.valleyjoist.com.
6. Verco Manufacturing Co.: www.vercodeck.com.
7. Substitutions: See Section 01 6000 - Product Requirements.

2.02 STEEL DECK

A. All Deck Types: Select and design metal deck in accordance with SDI Design Manual.
   1. Calculate to structural working stress design and structural properties specified.
   2. Maximum Vertical Deflection of Floor Deck:1/360 of span.
   3. Maximum Vertical Deflection of Roof Deck: 1/240 of span.

B. Acoustical Roof Deck: Non-composite type, steel sheet with plain vertical flute faces perforated with 1/8 inch diameter holes staggered 3/8 inch on center:
   1. Ungalvanized Steel Sheet: ASTM A1008/A1008M, Designation SS, Grade 33, Type 1.
   2. Primer: Shop coat of manufacturer's standard primer paint over cleaned and phosphatized substrate.
   3. Minimum Base Metal Thickness: 22 gauge, 0.0299 inch.
   4. Nominal Height: 1-1/2 inch.
   5. Profile: Fluted; SDI NR.
   6. Formed Sheet Width: 24 inch.
   7. Side Joints: Lapped, welded.
   8. End Joints: Lapped, welded.

C. Roof Deck: Non-composite type, fluted steel sheet:
   1. Galvanized Steel Sheet: ASTM A653/A653M, Structural Steel (SS) Grade 33/230, with G90/Z275 galvanized coating.
      a. Exterior conditions.
   2. Ungalvanized Steel Sheet: ASTM A1008/A1008M, Designation SS, Grade 33, Type 1.
   3. Primer: Shop primer over prepared and phosphatized substrate.
   4. Structural Properties:
      a. As indicated on Structural Drawings.
   5. Fire Resistance Classification: Comply with UL (FRD) Assembly Number: as indicated on drawings.

D. Composite Floor Deck: Fluted steel sheet embossed to interlock with concrete:
   1. Galvanized Steel Sheet: ASTM A653/A653M, Structural Steel (SS) Grade 33/230, with G90/Z275 galvanized coating.
      a. Galvanized Floor Deck at Mechanical Room Areas.
   2. Ungalvanized Steel Sheet: ASTM A1008/A1008M, Designation SS, Grade 33, Type 1.
   3. Primer: Shop primer over prepared and phosphatized substrate.
   4. Structural Properties:
      a. As indicated on Structural Drawings.
   5. Fire Resistance Classification: Comply with UL (FRD) Assembly Number.

2.03 ACCESSORY MATERIALS

A. Stud Shear Connectors: Made from ASTM A108 Grade 1015 bars.
B. Welding Materials: AWS D1.1/D1.1M.
C. Fasteners: Galvanized hardened steel, self tapping.
D. Steel Sheet Metal: 18-gauge, shop primed with screw fastener connections.
E. Weld Washers: Mild steel, uncoated, 3/4 inch outside diameter, 1/8 inch thick.
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, complying with VOC limitations of authorities having jurisdiction.
H. Flute Closures: Closed cell foam rubber, 1 inch thick; profiled to fit tight to the deck.
I. Acoustical Insulation: Glass fiber type, minimum 1.1 lb/cu ft density; profiled to suit deck.

2.04 FINISH

A. Shop prime steel deck.
   1. Do not prime surfaces that will be fireproofed, field welded, or in contact with concrete.
B. Surface Preparation: Clean surfaces to be painted. Remove loose rust, loose mill scale, and spatter, slag, or flux deposits. Prepare surfaces according to SSPC Specifications as follows:
   1. Galvanized Conditions:
      a. SSPC-SP 6 - Commercial Blast Cleaning.
   2. Ungalvanized Conditions:
      a. SSPC-SP 3 - Power Tool Cleaning.
C. Priming: Immediately after surface preparation, apply primer according to manufacturer’s instructions to provide a dry film thickness no less than 1.5 mils (0.038 mm). Use priming methods that result in full coverage of joints, corners, edges, and exposed surfaces.
D. Stripe paint corners, crevices, bolts, welds, and sharp edges.
E. Apply two coats of shop primer to surfaces that are inaccessible after assembly or erection.

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 and manufacturer's instructions. Align and level.
B. On concrete and masonry surfaces provide minimum 4 inch bearing.
C. On steel supports provide minimum 1 1/2 inch bearing.
D. Fasten deck to steel support members as indicated on Structural Drawings.
E. Side Seam Attachments: As indicated on Structural Drawings.
F. At welded male/female side laps, weld at 18 inches on center maximum.
G. Weld deck in accordance with AWS D1.3/D1.3M.
H. At openings between deck and walls, columns, and openings, provide sheet steel closures and angle flashings to close openings.
I. Close openings above walls and partitions perpendicular to deck flutes with single row of foam cell closures.
J. Weld stud shear connectors through steel deck to structural members below.
K. Immediately after welding deck and other metal components in position, coat welds, burned areas, and damaged surface coating, with touch-up primer.
L. After the erection is complete, all structural steel is to be reviewed by the Architect and/or Structural Engineer.

END OF SECTION 05 3100

SECTION 05 3400

ACOUSTICAL METAL DECKING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Furnish all labor, materials, equipment, tools and services required to fully complete all Acoustical Metal Decking work as is indicated on the drawings and/or specified herein including, but not limited to, the following described items.
B. Acoustical roof deck located in the following areas:
   1. Cafeteria.
C. Accessory hanging devices.
D. Do not include sales tax, refer to Section 00 1115 - Advertisement for Prequalification of Bidders.

1.02 RELATED REQUIREMENTS

A. Section 03 2000 - Reinforcing: Concrete and Masonry Reinforcing.
B. Section 04 2731 - Reinforced Unit Masonry: Placement of anchors for bearing plates or angles embedded in masonry.
C. Section 05 1200 - Structural Steel Framing: Support framing for openings and shear stud connectors.
D. Section 05 2100 - Steel Joist Framing: Support framing for openings and shear stud connectors.
E. Section 05 5000 - Metal Fabrications: Steel angle concrete stops at deck edges.
F. Section 09 9123 - Preparation for and application of field painting.
G. Division 22 - Plumbing: Reinforcement pans with drain hub assemblies and attachments to acoustical roof deck.
H. Division 23 - HVAC: Attachments to acoustical roof deck.
I. Division 26 - Electrical: Electrical, telephone, floor outlets, sleeves, gaskets, raceway and covers, and other attachments to acoustical roof deck.

1.03 REFERENCE STANDARDS

A. AISI S100-12 - North American Specification for the Design of Cold-Formed Steel Structural Members; 2012.
B. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2020.
C. ASTM A924/A924M - Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process; 2020.
D. ASTM C423 - Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method; 2022.
E. ASTM E795 - Standard Practices for Mounting Test Specimens During Sound Absorption Tests; 2016.
F. AWS D1.3/D1.3M - Structural Welding Code - Sheet Steel; 2018.
G. ICC-ES - International Code Council Evaluation Service; Current.
H. SDI (DM) - Publication No.30, Design Manual for Composite Decks, Form Decks, and Roof Decks; 2007.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordination:

1. Coordinate length of fasteners for roofing and thermal insulation to avoid penetrating the finished bottom surface of the panels.
2. Coordinate locations and size of shop-cut access openings in bottom of panels with affected trades.

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

1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittals procedures.
B. Shop Drawings: Indicate panel placement, profiles, material thicknesses, finishes, layout, anchorage, and openings as shown on Structural Drawings. Show access openings and covers if required.
C. Product Data: Provide manufacturer's specifications, section properties, load tables, diaphragm sheer tables, dimensions, finishes, and noise reduction coefficients.
D. Samples: Provide full width sample of each type of deck to verify compliance with the specifications and the level of quality. Provide a sample of hanging devices.
E. Certificates: Certify that products furnished meet or exceed specified requirements.
F. Submit manufacturer's installation instructions.
G. Welders Certificates: Certify welders employed on the Work, verifying AWS qualification within the previous 12 months.

1.06 QUALITY ASSURANCE

A. Design deck layout, spans, fastening, and joints under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed in Utah.
B. Acoustical roof deck to be approved by the International Code Council Evaluation Service ICC-ES for use as a structural roof deck and shear diaphragm, and have a valid ICC-ES evaluation report.
C. Section properties to be computed in accordance with the American Iron and Steel Institute (AISI) Specification for Design of Cold-Formed Steel Structural Members. AISI S100-12
D. Welding to comply with applicable provisions of the American Welding Society AWS D1.3/D1.3M Structural Welding Code - Sheet Steel.
E. Superimposed Load and Diaphragm Shear Capacities to be computed in accordance with the requirements to the Steel Deck Institute SDI (DM).
F. Noise Reduction Coefficients to be verified by the results of sound absorption tests conducted in accordance with ASTM C423 and ASTM E795.
G. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with minimum 5 years of documented experience.
H. Installer Qualifications: Company specializing in performing the work of this Section with minimum 5 years of documented experience and approved by manufacturer.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Store deck elevated on dry wood sleepers; slope for positive drainage and protect from weather with a ventilated covering.

1.08 GUARANTEE

A. The Contractor shall guarantee his work for a period of One (1) year from date of Substantial Completion. Guarantee shall be on form included in Section 01 7800.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Basis of Design Manufacturer:
   1. EPIC Metals Corporation; Product - Toris-A: www.epicmetals.com.
B. Other Approved Manufacturers:
   1. Nucor-Vulcraft Group: www.vulcraft.com.
   2. Verco Manufacturing Co.: www.vercodeck.com.
   3. New Millennium: www.newmill.com.
   4. Substitutions: See Section 01 6000 - Product Requirements.
      a. Manufacturer shall have been producing this product for a minimum of 5 years. Any product to be supplied must be approved by the architect a minimum of two weeks prior to bid date with a full width sample being submitted.

2.02 MATERIALS

A. Panels: Cold-formed from steel coils conforming to ASTM A653/A653M, Structural Quality, Grade 40 with minimum yield strength of 40,000 psi (40 ksi).
   1. Before forming, the steel coils to receive hot-dip protective coating of zinc conforming to ASTM A924/A924M Class G60 or G90 at Pool Area, as defined in ASTM A 653.
   2. Ensure that the actual gauge of the material for each area is as shown on the Structural Drawings.
   3. Ensure that minimum uncoated thickness of materials furnished is within 5 percent of the design thickness.

2.03 FABRICATION

A. Ensure that acoustical roof deck has continuous dovetail shaped ribs with quarter round edges as reveals.
B. Ensure that acoustical roof deck has full depth positive registering sidelaps that can be fastened by welds or screws.
C. Ensure acoustical roof deck is fabricated with perforations. Ensure that perforated areas are located in the bottom flat areas between the dovetail shaped ribs. Provide a minimum NRC value of .95. Establish this value by sound absorption tests without the use of fiberglass insulation above the panels.

2.04 FINISH

A. Acoustical Roof Deck:
   1. Prime paint the top and bottom surfaces of the acoustical roof deck with manufacturer's standard white. Before painting, chemically clean and coat the galvanized steel with an acid wash pretreatment primer, then follow with a coat of the manufacturer’s standard prime paint and oven bake. Compatibility of field applied finish paint with factory applied prime paint shall be the responsibility of the painting contractor.

2.05 ACCESSORIES

A. Provide manufacturer's standard ridge plates, valley plates, transition plates, and closures as indicated on the structural drawings.
B. Provide openings and reinforcement for openings as required.
C. Ensure Wedge Nut hanging devices are installable and relocatable along the length of the interior ribs of the acoustical roof deck. Consult the manufacturer’s product data for minimum spacing, load capacities, and proper installation procedure of the Wedge Nut hanging devices.
D. Acoustical Roof Deck:

1. Ensure acoustic elements are provided for installation above the perforations in the bottom flat area between the dovetail shaped ribs. To facilitate field painting of the perforated surfaces, ensure that the sound absorbing elements are supported above the surface by spacers. The roofing contractor shall furnish the sound absorbing elements and spacers for installation under this specification section. specified in this section.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine the supporting frame and other work relating to the acoustical roof deck to ensure the work has been properly completed.
B. Ensure that bundles of material are located on the supporting frame in such a manner that overloading of any individual framing members does not occur.
C. Ensure that all components of the acoustical roof deck are protected from significant damage during shipment and handling. If storage at the jobsite is required, elevate bundles or packages of materials above the ground, slope for positive drainage, and protect from the elements with a ventilated, waterproof covering.

3.02 INSTALLATION

A. Erect metal deck in strict accordance with SDI (DM), manufacturer's instructions and approved erection drawings. Align and level.
B. Before permanently fastening acoustical roof deck, place deck on the supporting frame and adjust to final position with ends accurately aligned and adequately bearing on the supporting frame. Maintain consistent coverage so that panels located in adjacent bays will be properly aligned.
C. Ensure that the cutting of acoustical roof deck to suit jobsite conditions is performed in a neat and workmanlike manner. Only those openings indicated on the Structural Drawings to be cut. Other opening to be cut and reinforced by those requiring the opening as approved by the Structural Engineer.
D. Acoustical Roof Deck:
    1. Fasten acoustical roof decks to all supporting members with six 3/4 inch (19 mm) diameter puddle welds per 24 inch wide sheet. Two (2) at outer flutes; one (1) at inner flute.
        a. Fasten the sides of the acoustical roof deck located at the perimeter of the building to supporting members with 3/4 inch (19 mm) diameter puddle welds at a maximum spacing of 12 inches on center or less as indicated on the manufacturer's erection drawings.
    2. Fasten acoustical roof deck sidelaps together with 1 1/2 inch (38 mm) long fillet welds or as indicated on the manufacturer's erection drawings.
E. Do not apply construction loads to acoustical roof deck until after the panels are permanently fastened to supporting members and sidelaps are attached; ensure loads do not exceed the load-carrying capacity of the panels.
F. Do not suspend items such as light fixtures, conduit, pipe, and ductwork from acoustical roof deck without specific approval of the Structural Engineer.
G. Fasten sump pans, ridge plates, valley plates, transition plates, eave plates, and supplied reinforcement for small openings as indicated on the manufacturer's erection drawings.
H. After the erection is complete, the Architect and/or Structural Engineer shall review all structural steel.

3.03 PROTECTION AND CLEANING

A. Avoid construction loads that could damage the acoustical roof deck such as heavy concentrated loads and impact loads. Use planking in all high traffic areas.

B. Galvanizing and other coatings that are damaged must be field repaired using appropriate methods and shall be the responsibility of the contractor.
C. Clean the bottom surface of the acoustical roof deck for field painting.

END OF SECTION 05 3400

This page intentionally left blank

SECTION 05 4000

COLD-FORMED METAL FRAMING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Furnish all labor, materials, equipment, tools, and services required to fully complete all Cold-Formed Metal Framing work as is indicated on the drawings and/or specified herein including, but not limited to, the following described items.
B. Formed steel stud structural exterior wall.
C. Do not include sales tax, refer to Section 00 1115 - Advertisement for Prequalification of Bidders.

1.02 RELATED REQUIREMENTS

A. Section 04 2001 - Masonry Veneer: Veneer masonry supported by wall stud metal framing.
B. Section 05 3100 - Steel Decking.
C. Section 06 1000 - Rough Carpentry: Wood blocking and miscellaneous framing.
D. Section 07 2100 - Building Insulation: Insulation within framing members.
E. Section 07 2500 - Membrane Weather Barriers: Water-resistive barrier over sheathing.
F. Section 07 6200 - Sheet Metal Flashing and Trim: Head and sill flashings.
G. Section 09 2116 - Gypsum Board Assemblies: Interior non-structural framing.
H. Section 09 5100 - Suspended Acoustical Ceilings: Ceiling suspension system.

1.03 REFERENCE STANDARDS

A. AISI S100 - North American Specification for the Design of Cold-Formed Steel Structural Members; 2016, with Supplement (2018).
B. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2016a.
C. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2020.
D. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Required Hardness, Solution Hardened, and Bake Hardenable; 2021a.
E. ASTM C955 - Standard Specification for Cold-Formed Steel Structural Framing Members; 2018, with Editorial Revision.
F. ASTM C1007 - Standard Specification for Installation of Load Bearing (Transverse and Axial) Steel Studs and Related Accessories; 2020.
G. ASTM C1177/C1177M - Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing; 2017.
H. AWS B2.1/B2.1M - Specification for Welding Procedure and Performance Qualification; 2021.
I. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2020, with Errata (2021).
J. AWS D1.3/D1.3M - Structural Welding Code - Sheet Steel; 2018.
K. SSPC-Paint 20 - Zinc-Rich Coating (Type I - Inorganic, and Type II - Organic); 2019.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordinate with work of other sections that is to be installed in or adjacent to the metal framing system, including but not limited to structural anchors, cladding anchors, utilities, insulation, and firestopping.

1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.
B. Product Data: Provide data on standard framing members; describe materials and finish, product criteria, and limitations .
C. Product Data: Provide manufacturer's data on factory-made framing connectors, showing compliance with requirements.
D. Shop Drawings: Indicate component details, framed openings, bearing, anchorage, loading, welds, and type and location of fasteners, and accessories or items required of related work.
    1. Describe method for securing studs to tracks and for bolted framing connections.
    2. Design data:
E. Manufacturer's Installation Instructions: Indicate special procedures, conditions requiring special attention .
F. Designer's Qualification Statement.
G. Manufacturer's Qualification Statement.
H. Welders' Qualification Statement: Welders' certificates in accordance with AWS B2.1/B2.1M and dated no more than 12 months before the start of scheduled welding work.
I. SSMA Manufacturer Qualification: Submit documentation of manufacturer association membership.
J. SSFSA Manufacturer Qualification: Submit documentation of manufacturer association membership.

1.06 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the types of products specified in this section, and with minimum three years of documented experience.
B. Manufacturer Qualifications: Member of Steel Stud Manufacturers Association (SSMA): www.ssma.com.
C. Manufacturer Qualifications: Member of Supreme Steel Framing System Association (SSFSA): www.ssfsa.com.
D. Welder Qualifications: Welding processes and welding operators qualified in accordance with AWS D1.1/D1.1M and AWS D1.3/D1.3M and dated no more than 12 months before start of scheduled welding work.
E. Installer Qualifications: Company specializing in performing the work of this section with minimum three years of documented experience and approved by manufacturer.

1.07 GUARANTEE

A. The Contractor shall guarantee his work for a period of One (1) year from date of Substantial Completion. Guarantee shall be on form included in Section 01 7800.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Metal Framing:
    1. CEMCO: www.cemcosteel.com.
    2. ClarkDietrich Building Systems: www.clarkdietrich.com.
    3. Jaimes Industries: www.jaimesind.com.
    4. Marino: www.marinoware.com.
    5. R-stud, LLC: https://rstud.biz.
    6. SCAFCO Corporation: www.scafco.com.
    7. Steel Construction Systems: www.steelconsystems.com.
    8. The Steel Network, Inc: www.SteelNetwork.com.

9. Metal Sales Corp.: www.metalsales.us.com.
10. Substitutions: See Section 01 6000 - Product Requirements.

B. Framing Connectors and Accessories:
   1. Same manufacturer as metal framing.

2.02 FRAMING SYSTEM

A. Provide primary and secondary framing members, bridging, bracing, plates, gussets, clips, fittings, reinforcement, and fastenings as required to provide a complete framing system.
B. Framing system should be able to tolerate movement of components without damage, failure of joint seals, undue stress on fasteners, or other detrimental effects when subject to seasonal or cyclic day/night temperature ranges.
   1. Framing system should be able to accommodate construction tolerances, deflection of building structural members, and clearances of intended openings.
C. Shop fabricate framing system to the greatest extent possible.
D. Deliver to project site in largest practical sections.

2.03 FRAMING MATERIALS

A. Studs and Track: ASTM C955; studs formed to channel, C- or Sigma-shaped with punched web; U-shaped track in matching nominal width and compatible height.
   1. Gauge and depth: As indicated on the Drawings, but no lighter than 54 mil .
   2. Galvanized in accordance with ASTM A653/A653M.
      a. G90 Exterior Walls.
      b. G60 Interior Wet Areas.
      c. G40 Interior Dry Areas.
   3. Provide components fabricated from ASTM A1008/A1008M Designation SS (structural steel).
B. Framing Connectors: Factory-made, formed steel sheet.
   1. Material: ASTM A653/A653M SS Grade 33 and 40 (minimum), with G90/Z275 hot dipped galvanized coating and factory punched holes and slots .
   2. Structural Performance: Maintain load and movement capacity required by applicable code, when evaluated in accordance with AISI S100.
   3. Movement Connections: Provide mechanical anchorage devices that accommodate movement using slotted holes, shouldered screws or screws and anti-friction or stepped bushings, while maintaining structural performance of framing. Provide movement connections where indicated on drawings.
      a. Where continuous studs bypass elevated floor slab, connect stud to slab in manner allowing vertical and horizontal movement of slab without affecting studs; allow for minimum movement of L/360.
      b. Where top of stud wall terminates below structural floor or roof, connect studs to structure in manner allowing vertical and horizontal movement of slab without affecting studs; allow for minimum movement of L/360.
      c. Provide top track preassembled with connection devices spaced to fit stud spacing indicated on drawings; minimum track length of 10 feet.
      d. Acceptable Products: VertiClip(r) or DriftClip(tm) manufactured by The Steel Network Inc.
   4. Fixed Connections: Provide non-movement connections for tie-down to foundation, floor-to-floor tie-down, roof-to-wall tie-down, joist hangers, gusset plates, and stiffeners.

2.04 FASTENERS

A. Self-Drilling, Self-Tapping Screws, Bolts, Nuts and Washers: Hot dip galvanized per ASTM A153/A153M.
B. Anchorage Devices: Powder actuated, Drilled expansion bolts, and Screws with sleeves.
C. Welding: In conformance with AWS D1.1/D1.1M and AWS D1.3/D1.3M.

2.05 ACCESSORIES

A. Bracing, Furring, Bridging: Formed sheet steel, thickness determined for conditions encountered; finish to match framing components.
B. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20 Type I - Inorganic, complying with VOC limitations of authorities having jurisdiction.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that building framing components are ready to receive work.
B. Verify field measurements and adjust installation as required.

3.02 INSTALLATION OF STUDS

A. Install components in accordance with ASTM C1007 requirements and ASTM C1007 requirements.
B. Align floor and ceiling tracks; locate to wall layout. Secure in place with fasteners at maximum 24 inches on center. Coordinate installation of sealant with floor and ceiling tracks.
C. Place studs at 16 inches on center; not more than 2 inches from abutting walls and at each side of openings. Connect studs to tracks using clip and tie method.
D. Construct corners using minimum of three studs. Install double studs at wall openings, door and window jambs.
E. Install load-bearing studs full length in one piece. Splicing of studs is not permitted.
F. Install load-bearing studs, brace, and reinforce to develop full strength and achieve design requirements.
G. Coordinate placement of insulation in multiple stud spaces made inaccessible after erection.
H. Install intermediate studs above and below openings to align with wall stud spacing.
I. Provide deflection allowance in stud track, directly below horizontal building framing at non-load bearing framing.
J. Attach cross studs to studs for attachment of fixtures anchored to walls.
K. Install framing between studs for attachment of mechanical and electrical items, and to prevent stud rotation.
L. Touch-up field welds and damaged galvanized surfaces with primer.

3.03 TOLERANCES

A. Maximum Variation from True Position: 1/8 inch.
B. Maximum Variation of any Member from Plane: 1/8 inch.

END OF SECTION 05 4000

SECTION 05 5000

METAL FABRICATIONS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Furnish all labor, materials, equipment, tools and services required to fully complete all Metal Fabrication work as indicated on the drawings and/or specified herein including, but not limited to, the following described items.
B. All required channels, tubes, angles, bent plates and headed stud anchors required for all stairway construction.
C. All required steel lintels.
D. All required angles, threaded rods required for folding panel partitions and accordion folding doors.
E. Stairs
    1. Channel stringers.
    2. Plate steel risers and treads.
F. Galvanized steel pipe bollards, as detailed on drawings.
G. Steel roof access ladders and elevator pit ladders.
    1. Galvanized at exterior conditions.
    2. At height conditions of 24 feet (7.3 m) or higher and/or as shown on drawings provide OSHA approved safety cage.
    3. Ladder guard.
    4. Lockable expanded metal doors.
H. Metal grating at roof ladders and catwalk.
I. Support angles or bent plates at wall furring.
J. Formed metal gratings, including perimeter closure.
K. Flat surface floor and stair tread plating.
L. Miscellaneous steel angles, plates and anchors as required.
M. Shop fabricated steel and aluminum items.
N. Ship ladders.
O. Fabricated aluminum tube device bollards.
P. Stainless steel wall panels - not in kitchen.
Q. Do not include sales tax, refer to Section 00 1115 - Advertisement for Prequalification of Bidders.

1.02 RELATED REQUIREMENTS

A. Section 03 3000 - Cast-in-Place Concrete: Placement of metal fabrications in concrete.
B. Section 04 2731 - Engineered Unit Masonry: Placement of metal fabrications in masonry.
C. Section 05 1200 - Structural Steel Framing: Structural steel column anchor bolts.
D. Section 05 2100 - Steel Joist Framing: Structural joist bearing plates, including anchorage.
E. Section 05 3100 - Steel Decking: Bearing plates for metal deck bearing, including anchorage.
F. Section 05 5213 - Pipe and Tube Railings.
G. Section 05 7300 - Decorative Railings.
H. Section 07 9513 - Expansion Joint Cover Assemblies.
I. Section 09 9113 - Exterior Painting: Paint finish.
J. Section 09 9123 - Interior Painting: Paint finish.

1.03 REFERENCE STANDARDS

A. AAMA 611 - Voluntary Specification for Anodized Architectural Aluminum; 2020.
B. AAMA 2603 - Voluntary Specification, Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix); 2021.
C. AAMA 2604 - Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix); 2021.
D. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix); 2020.
E. ASTM A276/A276M - Standard Specification for Stainless Steel Bars and Shapes; 2017.
F. AISC 201 - AISC Certification Program for Structural Steel Fabricators, Standard for Steel Building Structures; 2006.
G. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2019.
H. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless; 2020.
I. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2017.
J. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2016a.
K. ASTM A283/A283M - Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates; 2018.
L. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes; 2021a.
M. ASTM A501/A501M - Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing; 2021.
N. ASTM A554 - Standard Specification for Welded Stainless Steel Mechanical Tubing; 2021.
O. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2020.
P. ASTM A1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength; 2018a.
Q. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2015.
R. ASTM A786/A786M - Standard Specification for Hot-Rolled Carbon, Low-Alloy, High-Strength Low-Alloy, and Alloy Steel Floor Plates; 2015 (Reapproved 2021).
S. ASTM B210/B210M - Standard Specification for Aluminum and Aluminum-Alloy Drawn Seamless Tubes; 2019a.
T. ASTM B211/B211M - Standard Specification for Aluminum and Aluminum-Alloy Rolled or Cold Finished Bar, Rod, and Wire; 2019.
U. ASTM A992/A992M - Standard Specification for Structural Steel Shapes; 2020.
V. ASTM B26/B26M - Standard Specification for Aluminum-Alloy Sand Castings; 2018, with Editorial Revision.
W. ASTM B85/B85M - Standard Specification for Aluminum-Alloy Die Castings; 2018, with Editorial Revision.
X. ASTM B209/B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2021a.
Y. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2021.

Z. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric); 2021.
AA. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination; 2020.
BB. AWS B2.1/B2.1M - Specification for Welding Procedure and Performance Qualification; 2021.
CC. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2020, with Errata (2021).
DD. AWS D1.2/D1.2M - Structural Welding Code - Aluminum; 2014, with Errata (2020).
EE. IAS AC172 - Accreditation Criteria for Fabricator Inspection Programs for Structural Steel AC172; 2019.
FF. NAAMM MBG 531 - Metal Bar Grating Manual; 2017.
GG. NAAMM MBG 532 - Heavy Duty Metal Bar Grating Manual; 2019.
HH. SSPC-Paint 15 - Steel Joist Shop Primer/Metal Building Primer; 2004.
II. SSPC-Paint 20 - Zinc-Rich Coating (Type I - Inorganic, and Type II - Organic); 2019.
JJ. SSPC-SP 3 - Power Tool Cleaning; 2018.
KK. SSPC-SP 2 - Hand Tool Cleaning; 2018.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide span and deflection tables for metal grating systems and flat surface floor and stair tread plating.
C. Shop Drawings: Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories. Include erection drawings, elevations, and details where applicable.
    1. For metal grating systems and flat surface floor and stair tread plating, indicate details of component supports, openings, perimeter construction details, and tolerances.
    2. Indicate welded connections using standard AWS A2.4 welding symbols. Indicate net weld lengths.
D. Samples: For metal gratings and flat surface floor and stair tread plating, submit two samples, 12 inches by 12 inches in size illustrating surface finish, color, and texture.
E. Welders' Qualification Statement: Welders' certificates in accordance with AWS B2.1/B2.1M and dated no more than 12 months before start of scheduled welding work.
F. Fabricator's Qualification Statement: Provide documentation showing steel fabricator is accredited under IAS AC172 or AISC 201.
G. Manufacturer's Installation Instructions: Indicate special requirements for opening and perimeter framing.

1.05 QUALITY ASSURANCE

A. Welder Qualifications: Welding processes and welding operators qualified in accordance with AWS D1.1/D1.1M and AWS D1.2/D1.2M and dated no more than 12 months before start of scheduled welding work.
B. Fabricator Qualifications: A qualified steel fabricator that is accredited by IAS AC172.

1.06 GUARANTEE

A. The Contractor shall guarantee his work for a period of One (1) yearfrom date of Substantial Completion. Guarantee shall be on form included in Section 01 7800.

PART 2 PRODUCTS

2.01 MATERIALS - STEEL

A. Steel W Shapes and Tees: ASTM A992/A992M (50 KSI).
B. Steel Sections: ASTM A36/A36M.
C. Steel All-thread: ASTM A36/A36M

D. Steel Tubing: ASTM A500/A500M Grade C cold-formed structural tubing.
E. Steel Tubing: ASTM A501/A501M hot-formed structural tubing.
F. Plates: ASTM A283/A283M.
G. Steel Floor Plate: ASTM A786/A786M; manufacturer's standard pattern.
H. Sheet Steel for Die Stamping: ASTM A1011/A1011M Designation CS hot-rolled sheet.
I. Steel For Welding or Riveting: ASTM A36/A36M unfinished, of shapes indicated.
J. Steel Sheet for Lock Forming: Hot-dipped galvanized, ASTM A653/A653M, FS Type B, with G90/Z275 coating.
K. Steel Framing: ASTM A36/A36M shapes, unfinished.
L. Cross Bars: ASTM B211/B211M solid bars.
M. Pipe: ASTM A53/A53M, Grade B Schedule 40, black finish.
N. Stainless Steel, General: ASTM A666, Type 304.
O. Stainless Steel Tubing: ASTM A554, Type 304, 16 gauge, 0.0625 inch minimum metal thickness, 1-1/2 inch diameter.
P. Stainless Steel Bars, Shapes and Moldings: ASTM A276/A276M, Type 304.
Q. Slotted Channel Framing: ASTM A653/A653M, Grade 33.
R. Stainless Steel Finish: No. 4 Bright Polished finish.
S. Slotted Channel Fittings: ASTM A1011/A1011M.
T. Bolts, Nuts, and Washers: ASTM A325 (ASTM A325M), Type 1, galvanized to ASTM A153/A153M where connecting galvanized components.
U. Welding Materials: AWS D1.1/D1.1M; type required for materials being welded.
V. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.
W. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20, Type I - Inorganic, complying with VOC limitations of authorities having jurisdiction.

2.02 MATERIALS - ALUMINUM

A. Extruded Aluminum: ASTM B221 (ASTM B221M), 6063 alloy, T6 temper.
B. Sheet Aluminum: ASTM B209/B209M, 5052 alloy, H32 or H22 temper.
C. Aluminum-Alloy Drawn Seamless Tubes: ASTM B210/B210M, 6063 alloy, T6 temper.
D. Aluminum-Alloy Bars: ASTM B211/B211M, 6061 alloy, T6 temper.
E. Aluminum-Alloy Sand Castings: ASTM B26/B26M.
F. Aluminum-Alloy Die Castings: ASTM B85/B85M.
G. Aluminum For Lock Forming: ASTM B211/B211M bars, shapes as indicated.
H. Bolts, Nuts, and Washers: Stainless steel.
I. Welding Materials: AWS D1.2/D1.2M; type required for materials being welded.

2.03 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. Continuously seal joined members by continuous welds.
D. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.
E. Exposed Mechanical Fastenings: Flush countersunk screws or bolts; unobtrusively located; consistent with design of component, except where specifically noted otherwise.
F. Furnish components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.
G. Metal Grating Systems and Platings:
    1. Grating Type: NAAMM MBG 531, Pressure Locked Type.
    2. Grating Type: NAAMM MBG 532, Pressure Locked Type.

3. Fabricate grates and plates to accommodate design loads.
4. Mechanically clinch joints of intersecting metal sections.
5. Fabricate support framing for openings.
6. Top Surface: Serrated.

2.04 FABRICATED ITEMS

A. Bollards: Steel pipe, concrete filled, crowned cap, as detailed on Drawings; galvanized finish.
   1. Removable steel pipe bollards where shown on Drawings.
   2. Chain Hold-Opens: Galvanized clevis slip hook attached to 1/4 inch, Grade 30, galvanized steel chain, attached to bollard with a 2 inch by 1/2 inch steel loop, where shown on drawings.

B. Lintels: As scheduled on Structural Drawings; galvanized finish.

2.05 METAL GRATINGS AND PLATINGS

A. Manufacturers
   1. Ross Technology Corporation: www.rosstechnology.com.
   2. Substitutions: See Section 01 6000 - Product Requirements.

B. Performance Requirements
   1. Comply with applicable code for loading requirements.
   2. Load Design: NAAMM MBG 531.
   3. Design Live (Pedestrian) Load: Uniform load of 60 lb/sq ft minimum; concentrated load of 300 lbs.
   4. Maximum Allowable Deflection Under Live Load: 1/240 of span; size components by single support design.
   5. Maximum Spacing Between Bars: To restrict pedestrian shoe heels.

C. Materials
   1. Sheet Steel for Die Stamping: ASTM A1011/A1011M Designation CS hot-rolled sheet.
   2. Steel For Welding or Riveting: ASTM A36/A36M unfinished, of shapes indicated.
   3. Steel Sheet for Lock Forming: Hot-dipped galvanized, ASTM A653/A653M, FS Type B, with G90/Z275 coating.
   4. Steel Framing: ASTM A36/A36M shapes, unfinished.
   5. Aluminum For Lock Forming: ASTM B211/B211M bars, shapes as indicated.
   6. Cross Bars: ASTM B211/B211M solid bars.
   7. Welding Materials: AWS D1.1/D1.1M; type required for materials being welded.
   8. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.
   9. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20 Type I - Inorganic, complying with VOC limitations of authorities having jurisdiction.

D. Accessories
   1. Fasteners and Saddle Clips: Galvanized steel.
   2. Perimeter Closure: Of same material as grating.

2.06 FINISHES - METAL GRATING AND PLATING

A. Prepare surfaces to be primed in accordance with SSPC-SP 2.
B. Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.
C. Do not prime surfaces in direct contact with concrete or where field welding is required.
D. Prime paint items with one coat.
E. Galvanizing for Steel Shapes: ASTM A123/A123M.
F. Galvanizing for Steel Hardware: ASTM A153/A153M.
G. Non-Slip Surfacing: Aluminum oxide.

2.07 FINISHES - STEEL

A. Prime paint steel items.
   1. Exceptions: Galvanize items to be embedded in concrete, items to be imbedded in masonry, and items specified for galvanized 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. Prepare surfaces to be primed in accordance with SSPC-SP 3Power Tool Cleaning.
C. Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.
D. Prime Painting: One coat.
E. Galvanizing of Structural Steel Members: Galvanize after fabrication to ASTM A123/A123M requirements. Provide minimum 1.7 oz/sq ft galvanized coating.
F. Galvanizing of Non-structural Items: Galvanize after fabrication to ASTM A123/A123M requirements.
   1. Located at exterior conditions.

2.08 FINISHES - ALUMINUM

A. Exterior Aluminum Surfaces: Class I color anodized.
B. Interior Aluminum Surfaces: Class I natural anodized.
C. Class I Natural Anodized Finish: AAMA 611 AA-M12C22A41. Clear anodic coating not less than 0.7 mils thick.
D. Class II Natural Anodized Finish: AAMA 611 AA-M12C22A31. Clear anodic coating not less than 0.4 mils thick.
E. Class I Color Anodized Finish: AAMA 611 AA-M12C22A42. Integrally colored anodic coating not less than 0.7 mils thick; light bronze.
F. Class I Color Anodized Finish: AAMA 611 AA-M12C22A44. Electrolytically deposited colored anodic coating not less than 0.7 mils thick; light bronze.
G. Class II Color Anodized Finish: AAMA 611 AA-M12C22A34. Electrolytically deposited colored anodic coating not less than 0.4 mils thick; light bronze.
H. Pigmented Organic Coating System: AAMA 2603 polyester or acrylic baked enamel finish; color as indicated.
I. High Performance Organic Coating System: AAMA 2604 multiple coat, thermally cured fluoropolymer system; color as indicated.
J. Superior Performance Organic Coating System: AAMA 2605 multiple coat, thermally cured polyvinylidene fluoride system; color as indicated.
K. Apply one coat of bituminous paint to concealed aluminum surfaces in contact with cementitious or dissimilar materials.
   1. Epoxy paint or self adhered waterproof membrane may also be used.

2.09 FABRICATION TOLERANCES

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

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that field conditions are acceptable and are ready to receive work.
B. Verify that opening sizes and dimensional tolerances are acceptable.

C. Verify that supports are correctly positioned.

3.02 PREPARATION

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

3.03 INSTALLATION

A. Install items plumb and level, accurately fitted, free from distortion or defects.
B. Provide for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.
C. Field weld components as indicated on shop drawings.
D. Perform field welding in accordance with AWS D1.1/D1.1M.
E. Obtain approval prior to site cutting or making adjustments not scheduled.
F. After erection, prime welds, abrasionsand surfaces not shop primed or galvanized , except surfaces to be in contact with concrete.
G. Metal Gratings and Floor Plates:
    1. Install components in accordance with manufacturer's instructions.
    2. Place frames in correct position, plumb and level.
    3. Mechanically cut galvanized finish surfaces. Do not flame cut.
    4. Anchor by welding.
    5. Set perimeter closure flush with top of grating and surrounding construction.
    6. Secure to prevent movement.

3.04 TOLERANCES

A. Maximum Variation From Plumb: 1/4 inch per story, non-cumulative.
B. Maximum Offset From True Alignment: 1/4 inch.
C. Maximum Out-of-Position: 1/4 inch.
D. For Metal Gratings and Floor Plates:
    1. Comply with NAAMM MBG 531.
    2. Comply with NAAMM MBG 532.

END OF SECTION 05 5000

This page intentionally left blank

SECTION 05 5213

PIPE AND TUBE RAILINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Furnish all labor, materials, equipment, tools, and services required to fully complete all Pipe and Tube Railing work as is indicated on the drawings and/or specified herein including, but not limited to, the following described items.
B. Stair railings and guardrails.
   1. Locations: Scene Shop, Stage, and Catwalk.
C. Do not include sales tax, refer to Section 00 1115 - Advertisement for Prequalification of Bidders.

1.02 RELATED REQUIREMENTS

A. Section 03 3000 - Cast-in-Place Concrete: Placement of anchors in concrete.
B. Section 04 2001 - Masonry Veneer: Placement of anchors in masonry.
C. Section 04 2731 - Engineered Unit Masonry: Placement of anchors in masonry.
D. Section 05 7300 - Decorative Metal Railings: Handrails other than those specified in this section.
E. Section 09 2116 - Gypsum Board Assemblies: Placement of backing plates in stud wall construction.
F. Section 09 9123 - Interior Painting: Paint finish.

1.03 REFERENCE STANDARDS

A. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless; 2020.
B. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2017.
C. ASTM A780/A780M - Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings; 2020.
D. ASTM E935 - Standard Test Methods for Performance of Permanent Metal Railing Systems and Rails for Buildings; 2021.
E. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination; 2020.
F. AWS B2.1/B2.1M - Specification for Welding Procedure and Performance Qualification; 2021.
G. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2020, with Errata (2021).
H. AWS D1.6/D1.6M - Structural Welding Code - Stainless Steel; 2017, with Amendment (2021).
I. SSPC-Paint 15 - Steel Joist Shop Primer/Metal Building Primer; 2004.
J. SSPC-Paint 20 - Zinc-Rich Coating (Type I - Inorganic, and Type II - Organic); 2019.
K. SSPC-SP 2 - Hand Tool Cleaning; 2018.
L. SSPC-SP 3 - Power Tool Cleaning; 2018.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Shop Drawings: Indicate profiles, sizes, connection attachments, anchorage, size and type of fasteners, and accessories.
   1. Indicate welded connections using standard AWS A2.4 welding symbols. Indicate net weld lengths.

C. Samples: Submit two, 12 inch long samples of handrail. Submit two samples of elbow, Tee, wall bracket, escutcheon, and end stop.
D. Welders' Qualification Statement: Welders' certificates in accordance with AWS B2.1/B2.1M and dated within the previous 12 months.
E. Designer's Qualification Statement.
F. Fabricator's Qualification Statement.

1.05 QUALITY ASSURANCE

A. Structural Designer Qualifications: Professional Structural Engineer experienced in design of this work and licensed in the State in which the Project is located, or personnel under direct supervision of such an engineer.
B. Welder Qualifications: Welding processes and welding operators qualified within previous 12 months.
C. Fabricator Qualifications:

1.06 GUARANTEE

A. The Contractor shall guarantee his work for a period of One (1) year from date of Substantial Completion. Guarantee shall be on form included in Section 01 7800.

PART 2 PRODUCTS

2.01 RAILINGS - GENERAL REQUIREMENTS

A. Design, fabricate, and test railing assemblies in accordance with the most stringent requirements of applicable local code.
B. Distributed Loads: Design railing assembly, wall rails, and attachments to resist distributed force of 75 pounds per linear foot applied to the top of the assembly and in any direction, without damage or permanent set. Test in accordance with ASTM E 935.
C. Concentrated Loads: Design railing assembly, wall rails, and attachments to resist a concentrated force of 200 pounds applied at any point on the top of the assembly and in any direction, without damage or permanent set. Test in accordance with ASTM E 935.
D. Allow for expansion and contraction of members and building movement without damage to connections or members.
E. Dimensions: See drawings for configurations and heights.
    1. Top Rails and Wall Rails: 1-1/2 inches diameter, round.
    2. Intermediate Rails: 1-1/2 inches diameter, round.
    3. Posts: 1-1/2 inches diameter, round.
F. Provide anchors and other components as required to attach to structure, made of same materials as railing components unless otherwise indicated; where exposed fasteners are unavoidable provide flush countersunk fasteners.
    1. For anchorage to concrete, provide inserts to be cast into concrete, for bolting anchors.
    2. For anchorage to masonry, provide brackets to be embedded in masonry, for bolting anchors.
    3. For anchorage to stud walls, provide backing plates, for bolting anchors.
    4. Posts: Provide adjustable flanged brackets.
G. Provide welding fittings to join lengths, seal open ends, and conceal exposed mounting bolts and nuts, including but not limited to elbows, T-shapes, splice connectors, flanges, escutcheons, and wall brackets.
H. Welded and Brazed Joints: Make visible butt joints butt tight, flush, and hairline; use methods that avoid discoloration and damage of finish; grind smooth, polish, and restore to required finish.
    1. Ease exposed edges to a small uniform radius.

2. Welded Joints:
    a. Carbon Steel: Perform welding in accordance with AWS D1.1/D1.1M.
    b. Stainless Steel: Perform welding in accordance with AWS D1.6/D1.6M.

2.02 STEEL RAILING SYSTEM

A. Steel Pipe: ASTM A 53/A 53M Grade B Schedule 40, black finish.
B. Welding Fittings: Factory- or shop-welded from matching pipe or tube; seams continuously welded; joints and seams ground smooth.
C. Exposed Fasteners: No exposed bolts or screws.
D. Straight Splice Connectors: Steel concealed spigots.
E. Surface Preparation: Clean surfaces to be painted. Remove loose rust, loose mill scale, and spatter, slag, or flux deposits. Prepare surfaces according to SSPC-SP 2 Hand Tool Cleaning" or SSPC-SP 3 “Power Tool Cleaning as needed.
F. Exterior Galvanizing: In accordance with requirements of ASTM A123/A123M.
    1. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20 Type I - Inorganic.
    2. Galvanize at all exterior conditions.
G. Interior Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.

2.03 FABRICATION

A. Accurately form components to suit specific project conditions and for proper connection to building structure.
B. Fit and shop assemble components in largest practical sizes for delivery to site.
C. Fabricate components with joints tightly fitted and secured. Provide spigots and sleeves to accommodate site assembly and installation.
D. Welded Joints:
    1. Exterior Components: Continuously seal joined pieces by continuous welds. Drill condensate drainage holes at bottom of members at locations that will not encourage water intrusion.
    2. Interior Components: Continuously seal joined pieces by continuous welds.
    3. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.
E. Weld connections that cannot be shop welded due to size limitations.
    1. Weld in accordance with AWS D1.1/D1.1M.
    2. Match shop welding and bolting.
    3. Clean welds, bolted connections, and abraded areas.
    4. Touch up shop primer and factory-applied finishes.
    5. Repair galvanizing with galvanizing repair paint per ASTM A780/A780M.

PART 3 EXECUTION

3.01 EXAMINATION

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

3.02 PREPARATION

A. Clean and strip primed steel items to bare metal where site welding is required.
B. Supply items required to be cast into concrete or embedded in masonry with setting templates, for installation as work of other sections.

3.03 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Install components plumb and level, accurately fitted, free from distortion or defects, with tight joints.
C. Anchor railings securely to structure.
D. Field weld anchors as indicated on shop drawings. Touch-up welds with primer. Grind welds smooth.
E. Conceal anchor bolts and screws whenever possible. Where not concealed, use flush countersunk fastenings.

3.04 TOLERANCES

A. Maximum Variation From Plumb: 1/4 inch per floor level, non-cumulative.
B. Maximum Offset From True Alignment: 1/4 inch.
C. Maximum Out-of-Position: 1/4 inch.

END OF SECTION 05 5213

SECTION 05 7300

DECORATIVE RAILINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Furnish all labor, materials, equipment, tools, and services required to fully complete all Decorative Railing work as is indicated on the drawings and/or specified herein including, but not limited to, the following described items.
B. Interior steel guardrail assemblies.
C. Exterior and Interior stainless steel handrails.
D. Interior stainless steel free-standing railings at steps.
E. Do not include sales tax, refer to Section 00 1115 - Advertisement for Prequalification of Bidders

1.02 RELATED REQUIREMENTS

A. Section 03 3000 - Cast-in-Place Concrete: Placement of anchors in concrete.
B. Section 04 2001 - Masonry Veneer: Placement of anchors in masonry.
C. Section 04 2731 - Reinforced Unit Masonry: Placement of anchors in masonry.
D. Section 05 5000 - Metal Fabrications: Supports.
E. Section 05 5213 - Pipe and Tube Railings: Exterior handrails, Interior handrails and painted guardrails
F. Section 08 8100 - Glazed Wall Systems: Butt glass doors and windows.
G. Section 09 2116 - Gypsum Board Assemblies: Placement of backing plates in stud wall construction.

1.03 REFERENCE STANDARDS

A. 16 CFR 260.13 - Guides for the Use of Environmental Marketing Claims; Federal Trade Commission; Recycled Content; Current Edition.
B. ASTM A240/A240M - Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications; 2020a.
C. ASTM A554 - Standard Specification for Welded Stainless Steel Mechanical Tubing; 2021.
D. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2021.
E. ASTM C1107/C1107M - Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink); 2020.
F. ASTM E935 - Standard Test Methods for Performance of Permanent Metal Railing Systems and Rails for Buildings; 2021.
G. ASTM E985 - Standard Specification for Permanent Metal Railing Systems and Rails for Buildings; 2000 (Reapproved 2006).
H. AWS C3.4M/C3.4 - Specification for Torch Brazing; 2016.
I. AWS C3.5M/C3.5 - Specification for Induction Brazing; 2016, with Amendment (2017).
J. AWS C3.9M/C3.9 - Specification for Resistance Brazing; 2020.
K. AWS D1.6/D1.6M - Structural Welding Code - Stainless Steel; 2017, with Amendment (2021).
L. NAAMM AMP 500-06 - Metal Finishes Manual; 2006.
M. ASTM C1107/C1107M - Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink); 2020.
N. ASTM E985 - Standard Specification for Permanent Metal Railing Systems and Rails for Buildings; 2000 (Reapproved 2006).

1.04 ADMINISTRATIVE REQUIREMENTS

A. Pre-Installation Meeting: Schedule and conduct a preinstallation meeting one week before starting work of this section.
   1. Attendees shall include, but not be limited to:
      a. Contractor.
      b. Manufacturer's representative.
      c. Architect.
      d. Owner's representative.
      e. Other subcontractors of adjacent work.
   2. Review the following:
      a. Installation methods for frame components attaching to supporting construction.
      b. Installation, adjusting, and protection of railing assembly.
      c. Coordination of other work.

1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Product Data: Submit manufacturer's product data including description of materials, components, finishes, fabrication details, glass, anchors, and accessories.
C. Shop Drawings: Indicate railing system elevations and sections, details of profile, dimensions, sizes, connection attachments, anchorage, size and type of fasteners, and accessories. Indicate anchor and joint locations, brazed connections, transitions, and terminations.
D. Samples:
   1. Provide one 24 inch (600 mm) long railing system sample showing post, top rail, hand rail, and glass infill.
   2. Provide one wall mounted handrail bracket.
   3. Provide 6 inch by 6 inch sample of glass.
E. Test Reports: Submit test reports from an independent testing agency showing compliance with specified design and performance requirements.
F. Manufacturer's Installation Instructions.
G. Maintenance Data: Manufacturer's instructions for care and cleaning.
H. Warranty: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

1.06 QUALITY ASSURANCE

A. Installer Qualifications: Company specializing in installing glazed railing systems and acceptable to manufacturer.
B. Guard Rail System:
   1. Designed by Professional Structural Engineer licensed in the State of Utah to meet design requirements
C. Perform work in accordance with ASTM E985.
D. Design requirements for handrail and guard rail assemblies.
   1. Support distributed load of 50 pounds per linear foot (0.73kN/M), applied horizontally at right angles in any direction to the handrail.
   2. Support concentrated horizontal load of 200 pounds (0.89kN), applied in any direction at any point along handrail system.
   3. 50 lbs (0.22kN) on 1 sf (0.093m2) perpendicular to guard at any location.
   4. Design cantilevered glass railing system to withstand live loads in accordance with the latest edition of the IBC and ASCE 7.
   5. Distributed loads and concentrated loads not to be applied simultaneously.

1.07 MOCK-UP

A. Provide mock-up of railing system and wall mounted handrail, minimum 48 inches (1220 mm) long by full height.
   1. Show framing, infill, attachments, and accessories.
   2. Locate where directed by Architect.
   3. Approved mock-up may remain as part of the Work.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Deliver railing materials in factory provided protective coverings and packaging.
B. Protect railing materials against damage during transit, delivery, storage, and installation at site.
C. Inspect railing materials upon delivery for damage. Repair damage to be indistinguishable from undamaged areas; if damage cannot be repaired to be indistinguishable from undamaged parts and finishes, replace damaged items.
D. Prior to installation, store materials and components under cover, in a dry location.

1.09 FIELD CONDITIONS

A. Do not install railings until project is enclosed and ambient temperature of space is minimum 65 degrees F and maximum 95 degrees F.
B. Maintain ambient temperature of space at minimum 65 degrees F and maximum 95 degrees F for 24 hours before, during, and after railing installation.

1.10 WARRANTY/GUARANTEE

A. Warranty: Manufacturer's standard warranty against defects in materials, fabrication, finishes, and installation commencing on Date of Substantial Completion.
B. The Contractor shall guarantee his work for a period of One (1) year from date of Substantial Completion. Guarantee shall be on form included in Section 01 7800.

PART 2 PRODUCTS

2.01 STAINLESS STEEL HANDRAILS

A. Interior and Exterior Stainless Steel Handrails
   1. 1 1/2 inch (38.1 mm) outside diameter stainless steel pipe tube.
   2. Wall Thickness: Schedule 40.
   3. Internal Connection Sleeves: Sleeve, material compatible with handrail material.
   4. Elbows: Preformed mandrel bent elbows without seams.
      a. Acceptable Product: Preformed Stainless Steel Elbows (45, 55, 90, 125, 180 degrees with tangents as required).
      b. Mitered corners not acceptable.
   5. Posts: 1 1/2 inch (38.1 mm) outside diameter stainless steel pipe tube.
   6. Handrail Brackets: Stainless Steel brackets.
      a. Mounting: Wall.
      b. Acceptable Product: HR2FW by C.R. Laurence Co.
   7. Material: Stainless Steel
      a. Stainless Steel Shapes: ASTM A240/A240M, Type 304
      b. Stainless Steel Tubing: ASTM A554, Type 304
      c. Stainless Steel Finish: NAAMM AMP 503; No. 4 Finish.

2.02 GLAZED STEEL GUARDRAILS,

A. Steel and Iron.

1. Plates, Shapes, and Bars: ASTM A36/A36M.
2. Sizes and configuration as shown on drawings.

B. Stainless Steel
1. Stainless Steel Bars and Shapes: ASTM A276/A276M.
2. Sizes and configuration as shown on drawings.

C. Glass: Fully tempered, ASTM C1048, Condition A, Type 1, transparent, Class 1, Quality Q3, unless otherwise indicated. ASTM C1048.
1. Impact Strength: Category II, tested in accordance with 16 CFR 1201.
2. Thickness: 1/2 inch minimum laminated glass with PVB inner layer.
3. Edges: Flat polished.
4. Color: Clear.

D. Finish: Stainless steel and field painted, refer to drawings.

E. Stainless steel glass support RB51FBS by C.R. Laurence Co.

2.03 ACCESSORIES

A. Anchors and Fasteners: Provide anchors and other materials as required to attach to structure, made of same materials as railing components unless otherwise indicated; where exposed fasteners are unavoidable provide flush countersunk fasteners.
1. Type best suited to application.
2. Refer to Drawings for anchorage details.

B. Hydraulic Expansion Cement: ASTM C1107/C1107M

C. Bituminous Coating: Cold-applied asphalt mastic, noncorrosive compound free of asbestos, sulfur, and other deleterious impurities; 0.015 inch dry film thickness per coat.
1. Epoxy paint or self adhered waterproof membrane may also be used.

D. Sealant: Silicone; clear.

E. Finish Touch-Up Materials: As recommended by manufacturer for field application.

PART 3 EXECUTION

3.01 EXAMINATION

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

B. Verify field dimensions of locations and areas to receive work.

C. Notify Architect immediately of conditions that would prevent satisfactory installation.

D. Do not proceed with work until detrimental conditions have been corrected.

E. Furnish components to be installed in other work to installer of that other work, including but not limited to blocking, sleeves, inserts, anchor bolts, embedded plates and supports for attachment of anchors.

3.02 PREPARATION

A. Protect existing work.

B. Review installation drawings before beginning installation. Coordinate diagrams, templates, instructions and directions for installation of anchorages and fasteners.

C. Clean surfaces to receive units. Remove materials and substances detrimental to the installation.

3.03 INSTALLATION

A. Comply with manufacturer's drawings and written instructions.

B. Install components plumb and level, accurately fitted, free from distortion or defects and with tight joints, except where necessary for expansion.

C. Anchor securely to structure.

D. Conceal anchor bolts and screws whenever possible. Where not concealed, use flush countersunk fastenings.
E. Isolate dissimilar materials with bituminous coating, bushings, grommets or washers to prevent electrolytic corrosion.
    1. Epoxy paint or self adhered waterproof membrane may also be used.

3.04 TOLERANCES

A. Maximum Variation From Plumb: 1/4 inch per floor level, non-cumulative.
B. Maximum Offset From True Alignment: 1/4 inch.
C. Maximum Out-of-Position: 1/4 inch.

3.05 FIELD QUALITY CONTROL

A. Field Services: Provide the services of the manufacturer for field observation of installation of railings.

3.06 CLEANING

A. Remove protective film from exposed metal surfaces.
B. Metal: Clean exposed metal finishes with potable water and mild detergent, in accordance with manufacturer recommendations; do not use abrasive materials or chemicals, detergents or other substances that may damage the material or finish.

3.07 PROTECTION

A. Protect installed components and finishes from damage after installation.
B. Repair damage to exposed finishes to be indistinguishable from undamaged areas.
    1. If damage to finishes and components cannot be repaired to be indistinguishable from undamaged finishes and components, replace damaged items.

END OF SECTION 05 7300

This page intentionally left blank

SECTION 06 1000

ROUGH CARPENTRY

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Furnish all labor, materials, equipment, tools, and services required to fully complete all Rough Carpentry work as is indicated on the drawings and/or specified herein including, but not limited to, the following described items.
B. Sheathing.
C. Roof-mounted curbs.
D. Roofing nailers and parapet caps.
E. Preservative treated wood materials.
F. Fire retardant treated wood materials.
G. Miscellaneous framing and sheathing.
H. Communications and electrical room mounting boards.
I. Concealed and miscellaneous wood blocking, nailers, and supports.
J. Miscellaneous wood nailers, furring, and grounds.
K. Do not include sales tax, refer to Section 00 1115 - Advertisement for Prequalification of Bidders

1.02 RELATED REQUIREMENTS

A. Section 07 6200 - Sheet Metal Flashing and Trim: Sill flashings.

1.03 REFERENCE STANDARDS

A. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2016a.
B. ASTM D2898 - Standard Practice for Accelerated Weathering of Fire-Retardant-Treated Wood for Fire Testing; 2010 (Reapproved 2017).
C. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2021a.
D. AWC (WFCM) - Wood Frame Construction Manual for One- and Two-Family Dwellings; 2024, with Errata.
E. AWPA U1 - Use Category System: User Specification for Treated Wood; 2021.
F. PS 1 - Structural Plywood; 2009 (Revised 2019).
G. PS 20 - American Softwood Lumber Standard; 2021.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.
B. Product Data: Provide on all products including technical data on wood preservative materials.
C. Manufacturer's Certificate: Certify that wood products supplied for rough carpentry meet or exceed specified requirements.

1.05 DELIVERY, STORAGE, AND HANDLING

A. General: Cover wood products to protect against moisture. Support stacked products to prevent deformation and to allow air circulation.
B. Fire Retardant Treated Wood: Prevent exposure to precipitation during shipping, storage, and installation.

1.06 GUARANTEE

A. The Contractor shall guarantee his work for a period of One (1) year from date of Substantial Completion. Guarantee shall be on form included in Section 01 7800.

PART 2 PRODUCTS

2.01 GENERAL REQUIREMENTS

A. Dimension Lumber: Comply with PS 20 and requirements of specified grading agencies.
   1. Species: Treated Douglas Fir-Larch , unless otherwise indicated.
   2. If no species is specified, provide species graded by the agency specified; if no grading agency is specified, provide lumber graded by grading agency meeting the specified requirements.
   3. Grading Agency: Grading agency whose rules are approved by the Board of Review, American Lumber Standard Committee at www.alsc.org, and who provides grading service for the species and grade specified; provide lumber stamped with grade mark unless otherwise indicated.

B. Lumber fabricated from old growth timber is not permitted.

2.02 CONSTRUCTION PANELS

A. Miscellaneous Sheathing:
   1. Plywood Concealed From View But Located Within Exterior Enclosure: PS 1, C-C, Plugged or better, Exterior grade. 3/4 inch (19 mm) thick.
   2. Plywood Exposed to View But Not Exposed to Weather: PS 1, A-D, or better.
   3. Other Locations: PS 1, C-D Plugged or better.

2.03 ACCESSORIES

A. Fasteners and Anchors:
   1. Metal and Finish: Hot-dipped galvanized steel complying with ASTM A153/A153M for high humidity and preservative-treated wood locations, unfinished steel elsewhere.
   2. Drywall Screws: Bugle head, hardened steel, power driven type, length three times thickness of sheathing.
   3. Anchors: Toggle bolt type for anchorage to hollow masonry.

2.04 FACTORY WOOD TREATMENT

A. Treated Lumber and Plywood: Comply with requirements of AWPA U1 - Use Category System for wood treatments determined by use categories, expected service conditions, and specific applications.
   1. Fire-Retardant Treated Wood: Mark each piece of wood with producer's stamp indicating compliance with specified requirements.

B. Fire Retardant Treatment:
   1. Manufacturers:
      a. Arch Wood Protection, Inc: www.wolmanizedwood.com.
      b. Hoover Treated Wood Products, Inc: www.frtw.com.
      c. Osmose, Inc: www.osmose.com.
      d. Viance, LLC; D-Blaze: www.treatedwood.com.
      e. Substitutions: See Section 01 6000 - Product Requirements.

2. Exterior Type: AWPA U1, Category UCFB, Commodity Specification H, chemically treated and pressure impregnated; capable of providing a maximum flame spread index of 25 when tested in accordance with ASTM E84, with no evidence of significant combustion when test is extended for an additional 20 minutes both before and after accelerated weathering test performed in accordance with ASTM D2898.
    a. Kiln dry wood after treatment to a maximum moisture content of 19 percent for lumber and 15 percent for plywood.
    b. Treat exterior rough carpentry items.
    c. Do not use treated wood in direct contact with the ground.
3. Interior Type A: AWPA U1, Use Category UCFA, Commodity Specification H, low temperature (low hygroscopic) type, chemically treated and pressure impregnated; capable of providing a maximum flame spread index of 25 when tested in accordance with ASTM E84, with no evidence of significant combustion when test is extended for an additional 20 minutes.
    a. Kiln dry wood after treatment to a maximum moisture content of 19 percent for lumber and 15 percent for plywood.
    b. Treat rough carpentry items as indicated .
    c. Do not use treated wood in applications exposed to weather or where the wood may become wet.

PART 3 EXECUTION

3.01 INSTALLATION - GENERAL

A. Select material sizes to minimize waste.
B. Reuse scrap to the greatest extent possible; clearly separate scrap for use on site as accessory components, including: shims, bracing, and blocking.
C. Where treated wood is used on interior, provide temporary ventilation during and immediately after installation sufficient to remove indoor air contaminants.

3.02 FRAMING INSTALLATION

A. Set structural members level, plumb, and true to line. Discard pieces with defects that would lower required strength or result in unacceptable appearance of exposed members.
B. Make provisions for temporary construction loads, and provide temporary bracing sufficient to maintain structure in true alignment and safe condition until completion of erection and installation of permanent bracing.
C. Install structural members full length without splices unless otherwise specifically detailed.
D. Comply with member sizes, spacing, and configurations indicated, and fastener size and spacing indicated, but not less than required by applicable codes, AWC (WFCM) Wood Frame Construction Manual, and _____.
E. Construct double joist headers at floor and ceiling openings and under wall stud partitions that are parallel to floor joists; use metal joist hangers unless otherwise detailed.
F. Frame wall openings with two or more studs at each jamb; support headers on cripple studs.

3.03 MISCELLANEOUS FRAMING, BLOCKING, NAILERS, SUPPORTS, AND SHEATHING

A. Provide framing, blocking, and sheathing members as indicated or as required.

3.04 INSTALLATION OF CONSTRUCTION PANELS

3.05 TOLERANCES

A. Framing Members: 1/4 inch from true position, maximum.

B. Variation from Plane, Other than Floors: 1/4 inch in 10 feet maximum, and 1/4 inch in 30 feet maximum.

3.06 CLEANING

A. Do not leave 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 06 1000

SECTION 06 4100

ARCHITECTURAL CASEWORK

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Furnish all labor, materials, equipment, tools, and services required to fully complete all Architectural Casework work as is indicated on the drawings and/or specified herein including, but not limited to, the following described items.
B. Plastic laminate-faced casework.
C. Plastic laminate faced wall panels.
D. Countertops.
   1. Plastic laminate.
   2. Solid wood maple countertop.
E. Casework hardware.
F. Library Book Return Cart.
G. Shelving, shelf standards, brackets, and accessories.
H. Slat wall panels.
I. Factory finishing.
J. Preparation for installing utilities.
K. Fixed and sliding glass in cabinets.
   1. Location: School Store B108.
L. Do not include sales tax, refer to Section 00 1115 - Advertisement for Prequalification of Bidders.

1.02 RELATED REQUIREMENTS

A. Section 06 1000 - Rough Carpentry: Support framing, grounds, and concealed blocking.
B. Section 06 6116 - Solid Surfacing Fabrications: Countertops.

1.03 REFERENCE STANDARDS

A. ANSI A208.1 - American National Standard for Particleboard; 2016.
B. ANSI A208.2 - Medium Density Fiberboard (MDF) for Interior Applications; 2016.
C. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards, 2nd Edition; 2014, with Errata (2016).
D. AWMAC/WI (NAAWS) - North American Architectural Woodwork Standards; 2021, with Errata.
E. BHMA A156.9 - Cabinet Hardware; 2020.
F. NEMA LD 3 - High-Pressure Decorative Laminates; 2005.
G. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2018.
H. ICC (IBC) - International Building Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene a preinstallation meeting not less than one week before starting work of this section; require attendance by all affected installers.
B. Coordinate fabrication, delivery, and installation with the General Contractor and other applicable trades.

1.05 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. Scale of Drawings: 1-1/2 inch to 1 foot, minimum.
   2. Provide the information required by AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS) Section 1 - Submittals.
   3. Include certification program label.
   4. Field verify all room dimensions as a part of manufacturing casework.
C. Product Data: Provide data for hardware accessories.
D. Samples: Submit actual samples of architectural cabinet construction, minimum 12 inches square, illustrating proposed cabinet, countertop, and shelf unit substrate and finish.
E. Samples: Submit actual sample items of proposed pulls, hinges, shelf standards, and locksets, demonstrating hardware design, quality, and finish.

1.06 QUALITY ASSURANCE

A. Millwork and installation shall be in accordance with Premium Grade or Custom Grade of the Architectural Woodwork Standards, latest edition. If provisions for the Grade specified are in conflict with, or modified by the drawings and/or specifications, the modifications shall govern.
B. Fabricator Qualifications: Company specializing in fabricating the products specified in this section with minimum five years of documented experience.
   1. Company with at least one project in the past 5 years with value of woodwork within 20 percent of cost of woodwork for this Project.
C. Quality Standard:
   1. All work shall comply with the latest edition of NAAWS.
   2. Replace, repair, or rework all work for which deficiencies are identified.

1.07 MOCK-UP

A. Provide mock-up of typical base cabinet, wall cabinet, countertop, and base cabinet with at least one drawer, including hardware, finishes, and plumbing accessories of each type of casework specified.
B. See Section 01 4000 - Quality Requirements for additional requirements.
C. Locate where directed.
D. Mock-up may remain as part of the Work, if undisturbed at time of substantial completion at the discretion of the Architect.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Protect units from moisture damage.
B. Deliver materials only when the project is ready for installation and the general contractor has provided a clean storage area.
   1. Delivery of architectural millwork shall be made only when the area of operation is enclosed, all plaster and concrete work is dry and the area broom clean.
C. Any damage to casework during installation will be properly repaired or replaced.

1.09 FIELD CONDITIONS

A. During and after installation of custom cabinets, maintain temperature and humidity conditions in building spaces at same levels planned for occupancy.

1.10 GUARANTEE

A. The Contractor shall guarantee his work for a period of One (1) year from date of Substantial Completion. Guarantee shall be on form included in Section 01 7800.

PART 2 PRODUCTS

2.01 FABRICATORS/INSTALLERS

A. Subject to compliance with requirements, provide products and labor by one of the following:
   1. Pacific Cabinets, Murray, Utah (801) 262-4663.
   2. Granite Mill, Inc., Salt Lake City, UT, (801) 467-3222.
   3. Huetter Mill, Murray, UT, (801) 266-3222.
   4. Advanced Cabinets LLC, Midvale, Utah (801) 251-0155.
   5. Johnson Brothers Mill, Idaho Falls, ID, (208) 522-3674.
   6. Artistic Mill, Murray, UT, (801) 262-8851.
   7. Evolve Cabinets, Salt Lake City, UT. (801) 810-4209.
   8. Substitutions: See Section 01 6000 - Product Requirements.

B. Single Source Responsibility: A single millwork fabricator/installer shall provide and install the work of this Section and Section 06 2000 - Finish Carpentry.

2.02 CABINETS

A. Seismic-Compliant Construction: Comply with all requirements of Seismic Design Category D, ICC (IBC).

B. Quality Standard: Custom Grade, in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), unless noted otherwise.
   1. Premium Grade: Non-specified.
   2. No Economy Grade Cabinets Accepted.

C. Plastic Laminate Faced Cabinets: Custom Grade.
   1. Exposed Exterior/Interior Surfaces: HDPL, Type VGS.
   2. Semi-Exposed Surfaces: LDPL.
   3. Concealed Surfaces: LDPL.
   4. Casework Construction Type: Frameless.
   5. Interface Style: Reveal Overlay.
   6. Doors, Drawer Fronts, and False Fronts: Flush Overlay.
      a. Edgeband: Through-Color ABS Edgebanding to match laminate patterns and colors.
      b. Edge Profile: Radius edge with 3mm applied band.
   7. Hinges: Five knuckle.
   8. Core Material: Combination Core.

D. Toe Kick Finish: Rubber, tile, vinyl, or other finished base shall be furnished and installed by others.

E. Fixed and Adjustable Shelving:
   1. All shelving is 1 inch (25 mm) thick, no exceptions.

2.03 CORE MATERIALS

A. Manufacturers:
   1. Roseburg: http://www.roseburg.com.
   2. Columbia Forest Products: www.columbiaforestproducts.com.
   3. States Industries: www.statesind.com.
   4. Substitutions: See Section 01 6000 - Product Requirements.

B. Core Materials:
   1. Combination Core: ANSI A208.1 or ANSI A208.2; composed of engineered MDF composite crossbands combined with inner plies of veneer core.
      a. Provide products having no added urea-formaldehyde resins.

2. Water Resistant Medium Density Fiberboard (MDF): ANSI A208.2, industrial grade MDF; composed of wood fibers pressure bonded with moisture resistant adhesive to suit application; sanded faces; thickness as indicated.

2.04 WOOD-BASED COMPONENTS

A. Wood fabricated from old growth timber is not permitted.
B. Lumber shall be in accordance with the Architectural Woodwork Standards Grade specified for the product being fabricated. Moisture Content shall be 6 percent to 12 percent for boards up to 2 inches (50.8 mm) nominal thickness, and shall not exceed 19 percent for thicker pieces.
C. Veneers shall be in accordance with the Architectural Woodwork Standards requirements for its use and the Grades.
D. Hardwood Edgebanding: Use solid hardwood edgebanding matching species, color, grain, and grade for exposed portions of cabinetry.

2.05 LAMINATE MATERIALS

A. Manufacturers:
   1. Basis of Design: Formica Corporation: www.formica.com.
   2. Other Manufacturers:
      a. Pionite: www.panolam.com/pionite.
      b. Wilsonart: www.wilsonart.com.
      c. Panolam Industries International, IncNevamar: www.nevamar.com.
      d. Substitutions: See Section 01 6000 - Product Requirements.
B. High Pressure Decorative Laminate (HPDL): NEMA LD 3, types as recommended for specific applications.
   1. Provide specific types as follows:
      a. Horizontal Surfaces: HGS, 0.048 inch nominal thickness, through color, colors/patterns as selected from manufacturer's full line (including premium), finishes as selected from manufacturer's full range.
      b. Vertical Surfaces: VGS, 0.028 inch nominal thickness, through color, colors/patterns as selected from manufacturer's full line (including premium), finishes as selected from manufacturer's full range.
C. Low Pressure Decorative Laminate (LPDL): NEMA LD 3
   1. Colors as selected from manufacturer's full line.
D. ABS/PVC Edgebanding: Through-Color ABS/PVC Edgebanding to match laminate patterns and colors.
   1. 0.5 mm thick at Case Bodies.
   2. 3 mm thick at Doors, Drawer Fronts, False Fronts, and Shelves.
   3. Manufacturers:
      a. Wilsonart International, Inc: www.wilsonart.com.
      b. ReHau, Inc: www.rehau.com.
      c. Substitutions: See Section 01 6000 - Product Requirements.

2.06 COUNTERTOPS

A. Quality Grade: Unless otherwise indicated provide products of quality specified by AWI//AWMAC/WI Architectural Woodwork Standards for Grades corresponding with Casework Quality Grades.
B. Solid Surface Countertops: Refer to Section 06 6116 - Solid Surfacing Fabrications.
C. Solid Wood Maple Countertops:
   1. Laminated solid wood maple finished smooth.
   2. Size: As shown on drawings

3. Grade: Industrial
4. Thickness: 1 3/4 inch.

D. Plastic Laminate Countertops: High pressure decorative laminate sheet bonded to substrate.
1. Laminate Sheet: HPDL, Type HGS.
   a. Wear Resistance: In addition to specified grade, comply with NEMA LD 3 High Wear Grade requirements for wear resistance.
   b. Laminate Core Color: Same as decorative surface.
2. Front Edge Treatment: Postformed laminate; front edge substrate built up to minimum 1-1/4 inch (32 mm) thick with 180 degree radiused edge.
   a. Return laminate under substrate to back of vertical face of cabinet, fully capsulating the substrate.
3. Back Splash: Self-edge, square butt splash, 4 inches (100 mm) above deck.
4. Supporting Substrate: Medium Density Fiberboard.
   a. Use Water Resistant Medium Density Fiberboard at Wet Locations.
5. Fabricate tops and splashes in the largest sections practicable, with top surface of joints flush.
   a. Join lengths of tops using best method recommended by manufacturer.
      1) Fabricate to overhang fronts and ends of cabinets 1 inch except where top butts against cabinet or wall.
   b. Prepare all cutouts accurately to size; replace tops having improperly dimensioned or unnecessary cutouts or fixture holes.
      1) Return laminate under substrate to back of vertical face of cabinet, fully capsulating the substrate.
6. Provide back/end splash wherever counter edge abuts vertical surface unless otherwise
   a. Secure to countertop with concealed fasteners and with contact surfaces set in waterproof glue.
   b. Height: 4 inches, unless otherwise indicated.
7. Wall-Mounted Counters: Provide skirts, aprons, brackets, and braces, finished to match..

2.07 ACCESSORIES

A. Adhesives: Type recommended by WI to suit application.
B. Perforated Metal Infill Panel: Stainless Steel Type 316L, 16 gauge, Mill finish, 3/16 inch holes on 3/8 inch centers, staggered pattern, 23 percent open area.
1. Manufacturer: McNichols Co: www.mcnichols.com.
C. Bolts, Nuts, Washers, Lags, Pins, and Screws: Of size and type to suit application; galvanized or chrome-plated finish in concealed locations and stainless steel finish in exposed locations.
D. Concealed Joint Fasteners: Threaded steel.
1. Hot glue and dowels.
2. Threaded steel.
E. Grommets: Standard plastic or rubber grommets for cut-outs, in color to blend with adjacent surface.
F. Silicone Sealant: ASTM C920, Grade NS, Class 25, Uses NT, A, G, M , O; single component, solvent curing, non-sagging, non-staining, fungus resistant, non-bleeding.
1. Color: Clear.
2. Movement Capability: Plus and minus 25 percent.
3. Service Temperature Range: -65 to 180 degrees F (-54 to 82 degrees C).
4. Shore A Hardness Range: 15 to 35.
5. Acceptable Manufacturers: Refer to Section 07 9200 - Joint Sealants.

2.08 HARDWARE

A. Hardware: Meeting all BHMA A156.9 Standards and AWI//AWMAC/WI Architectural Woodwork Standards for Grades indicated.

B. Manufacturers:
   1. Rockford Process Control: www.rockfordprocess.com.
   2. Hardware Resources: www.hardwareresources.com.
   3. Salice America, Inc: www.saliceamerica.com.
   4. Grass America, Inc: www.grassusa.com.
   5. Hettich America, LP: www.hettichamerica.com.
   6. Julius Blum, Inc: www.blum.com.
   7. Accuride International, Inc: www.accuride.com.
   8. Knape & Vogt Manufacturing Company: www.kv.com.
   9. Fellowes Corporation: www.fellowes.com.
   10. Hafele America: www.hafele.com.
   11. Bainbridge Manufacturing, Inc: www.bainbridgestore.com.
   12. Ives (Ingersoll Rand): www.professional.iveshardware.com.
   13. Substitutions: See Section 01 60 00 - Product Requirements.

C. Hinges:
   1. Five Knuckle Hinge:
      a. Institution grade, overlay cabinet hinge with hospital tip
      b. Certification: BHMA A156.9 standard, grade 1 requirement for vertical and horizontal set and sag.
      c. Length: 2 3/4 inch.
      d. Finish: US26D.
      e. Type: 270 degree opening.
      f. Closing Action: Non-self closing.
         1) Provide magnetic door catch at each door.
         2) Metal housing. Plastic housing not acceptable.
      g. Acceptable Product: 370 series by Rockford Process Control
   2. Three Knuckle Hinge:
      a. Institution grade, overlay cabinet hinge.
      b. Certification: BHMA A156.9 standard, grade 1.
      c. Length: 2 3/4 inch.
      d. Finish: Matt Nickel.
      e. Type: 270 degree opening.
      f. Closing Action: Integrated catch.
      g. Adjustment: 3D.
      h. Acceptable Product: Aximat 300 by Hafele.

D. Drawer Slides:
   1. General Purpose Drawers: Ball bearing slide with rail/bracket mount, full extension plus 1 inch (25 mm) over travel slides, hold-in detent and a 100 lbs /pair load rating. RoHS compliant and BHMA certified to Grade 1 HD-100. RoHS compliant.
      a. Acceptable Product: 3832E - 3834E manufactured by Accuride.
   2. File Drawers: Ball bearing slide with rail/bracket mount, full extension plus 1 inch (25 mm) over travel slides, hold-in detent and a 100 to 150 lbs/pair load rating. RoHS compliant and BHMA certified to Grade 1 HD-100. RoHS compliant.
      a. Acceptable Product: 4032- 4035 manufactured by Accuride.
   3. Drawer slides shall have a lifetime warranty as offered by the manufacturer

E. Locks with Strikes: 2 keys per lock, key all cabinets in same room to one key, rooms keyed different, one master key fits all. review keying requirements and schedules with Owner prior to installation.
   1. Drawer and Door Locks: 5-pin tumbler, complying with ANSI/BHMA A156.11, Grade 1.
   2. Doors and Drawers: 7/8 inch for doors and 7/8 - 1 3/8 inch for drawers.
   3. Finish: Satin Chrome: 26D.
   4. Cam type locks are not acceptable.
   5. Acceptable Products:
      a. Olympus Lock, Inc; Product - "100DR, 200DW, 329R": www.olympus-lock.com.
      b. CompX National; Product - "National Lock C8178, C8173, C8179": www.compxnet.com.
      c. Hafele America; Product - "232.14 Series": www.hafele.com.
      d. No substitutions allowed.

F. Chain Bolts and Elbow Catches: Chain bolts are 3 inches long, and have an 18 inch pull and an angle strike to secure inactive door on cabinets over 72 inches in height. Elbow catches are used on inactive doors up to and including 72 inches in height.

G. Elbow Catch: Die cast aluminum with clear anodized finish.

H. Drawer and Door Pulls: "U" shaped wire pull, stainless steel with satin finish, 4 inch (100 mm) centers.

I. Adjustable Shelf Supports: Adjustable shelves shall be supported on adjustable shelf supports inserted in shelf holes drilled into the case end or partitions and adjustable on 1 1/2 inch (38 mm) centers. Supports shall be clear nylon, dual-pegged shelf securing clips (no exceptions).
   1. Acceptable Product: Model 3220 - Duel Peg Locking Tongue Support manufactured by Bainbridge Manufacturing, Inc.

J. Coat and Hat Hooks: Shall be cast aluminum with finish as selected by Architect.
   1. Acceptable Product: Ives #405" manufactured by Ives (Ingersoll Rand).

K. Casters: All casters for mobile cabinets shall be 4 inches (102 mm) high swivel casters with 1 1/16 inches (27 mm) tread and locking brakes on two casters per cabinet.

L. Wardrobe Clothes Rod w/ Sockets: Shall be 1 1/16 inch (27 mm) OD. tubing with stainless steel finish . Sockets shall have chrome finish.

M. Hanging File Rods: All “File” type drawers to receive (2) 1/8 inch (3 mm) x 1 inch (25 mm) galvanized steel or aluminum rods w/ steel clips that attach to inner face of drawer box. Allow clearance for hanging folders and label tabs.

2.09 LIBRARY BOOK RETURN CART

A. 44 Series duraLight Alloy Under Counter Cart by Kingsley: www.kingsley.com.
   1. Dimensions: 25-1/2 inches wide by 28 5/8 inches deep by 24 9/16 inches high.
   2. Capacity: 6.8 cubic feet capacity.
   3. Load Limit: 200 lbs.; 90kg.

2.10 SHELVING

A. Extra-Duty Shelf Standards: Double-slotted channel standards for brackets adjustable in 1 inch (25 mm) increments along entire length of standard, drilled and countersunk for screws.
   1. Acceptable Product: KV 85 by Knape & Vogt Manufacturing: www.knapeandvogt.com.
      a. Substitutions: See Section 01 6000 - Product Requirements.
   2. Load Capacity: Recommended by manufacturer for loading of 300 to 680 pounds (135 to 310 kg) per pair of brackets.
   3. Material: 16 gauge steel.
   4. Lengths: As indicated on drawings.
   5. Finish: Anochrome.
   6. Finish: Powder-coated, white; provide screws with matching heads.

7. Brackets: Double tab type, locking into slots; size to suit shelves; same finish as standards.
8. Bracket Quantity: Provide one bracket for each 12 inches (305 mm) of standard length.

B. Shelf Standard Accessories:
1. Where cornices are indicated as part of shelving provide cornice brackets.
2. Provide brackets with flanges for screwing into end of shelf, steel shelf rests, or flanged brackets; fasten with screws.
3. Provide other accessories as indicated.

C. Laminate Faced Shelves: Medium density fiberboard covered with high pressure decorative laminate on both sides. Thermo-fused melamine may be used at utility areas (custodial, storage rooms, etc) with approval from Architect.
1. Edge Finish: Matching laminate, all four edges.
2. Substrate Thickness: 1 inch (25 mm), nominal.
3. Length: As indicated on drawings.
4. Laminate: NEMA LD 3 Type HGS.
5. Laminate Color and Pattern: To be selected by Architect from laminated manufacturer's full line.
6. At all Custodial and Storage Rooms, the lowest three (3) shelves shall have a lip extending 1 inch (25 mm) above top surface, constructed of same materials; glued and screwed into shelf edge.

D. Fasteners: Screws as recommended by manufacturer for intended application or as otherwise required by project conditions.

2.11 PLASTIC LAMINATE FACED WALL PANELS

A. Plastic Laminate Faced Panels: General.
1. Edge Treatment: Extruded aluminum trim.
a. Easy Panel System by Monarch Metal Fabrication: www.monarchmetal.com.
b. Top, bottom, and end - EPS-ET075-N.
c. Outside corner - EPS-OC075-RD.
d. Panel to panel horizontal - EPS-H075-R.
e. Panel to panel vertical - EPS-V075-R.
2. Supporting Substrate: Combination core.
3. Backing Sheet: 0.028 inches minimum high pressure phenolic.
4. Attachment hardware: MF375 Z clip system by Monarch Metal Fabrication; www.monarchmetal.com.
a. Wall: Continuous horizontal rails at 32 inches O.C. vertical (2 intermediate rails per 8-foot-tall panel).
b. Panel: Clips at 14 inches O.C horizontal and 32 inches O.C. vertical at continuous horizontal rails and top and bottom edge trim. (4 clips per 4-foot-wide panel).
1) Fasteners: #8 x 3/4" pan head.

B. Plastic Laminate Faced Panels: Wall Finish W5.
1. High-pressure decorative laminate sheet bonded to substrate.
a. Laminate: As selected by architect from manufacturer's full line.
1) Edge Treatment: Extruded Aluminum Trim.

C. Plastic Laminate Faced Panels: Wall Finish W13.
1. High pressure decorative laminate sheet bonded to substrate.
a. Laminate: As selected by architect from manufacturer's full line.
1) Edge Treatment: 0.5mm PVC edgebanding.

2.12 SLATWALL DISPLAY PANELS

A. Slatwall Display Panels: Medium Density Fiberboard (MDF) with cut grooves to accept standard slatwall accesories for merchandising displays.
   1. Standard Panel Size: 3/4 inch (19 mm) thick by 48 inches (1220 mm) high by 96 inches (2438 mm) wide.
   2. Board Properties: 48lb. (21.8kg) density with an internal bond stength of 110 lbs (50 kg) per square inche. MDF has a linear expansion of 0.30 percent and a moisture content of 6 to 8 percent. The screw holding capacity for the face is 350 lbs (159 kg) and 275 lbs (125 kg) for the edge.
   3. Groove Spacing: 3 inches (75 mm) on center.
   4. Surface Finish: As selected by architect from manufacturer's full line.
   5. Groove Finish: Black aluminum groove inserts.
   6. PVC edge banding to match face color.

B. Slatwall Accesories - Provide the Following:
   1. Heavy Duty Slatwall Hooks:
      a. Set of ten (10) 6-inch slatwall hooks.
      b. Set of ten (10) 8-inch slatwall hooks.
   2. Rectangular Straight Arms:
      a. Set of three (3) 12-inch arms.
      b. Color: Chrome.
   3. Rectangular Waterfalls:
      a. Set of three (3) seven-ball waterfalls.
      b. Set of two (2) 5-hook waterfalls.
   4. Knife Edge Brackets:
      a. Set of eight (8) 12-inch brackets.
      b. Color: Chrome.
   5. Duron Bullnose Shelves:
      a. Set of four (4) 13 inches (330 mm) wide by 24 inches (600 mm) long shelves.
      b. Color: Black.

C. Manufacturers:
   1. Basis of Design: www.panel.com.
   2. Other Manufacturers:
      a. Trio Display: www.triodisplay.com.
      b. Wind Mill Woodworking, Inc: www.windmillwood.com.
      c. Gabriel Logan: www.gabriellogan.com.
      d. Substitutions: See Section 01 6000 - Product Requirements.

2.13 FABRICATION

A. Note: AWI//AWMAC/WI Architectural Woodwork Standards for Premium Grade shall take precedence if any conflict arises with fabrication guidelines below.

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

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

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

E. Plastic Laminate: Apply plastic laminate finish in full uninterrupted sheets consistent with manufactured sizes. Fit corners and joints hairline; secure with concealed fasteners. Slightly bevel arises. Locate counter butt joints minimum 2 feet from sink cut-outs.
   1. Apply laminate backing sheet to reverse side of plastic laminate finished surfaces.

2. Cap exposed plastic laminate finish edges with material of same finish and pattern.

F. Matching Wood Grain: Comply with requirements of quality standard for specified Grade and as follows:
   1. Provide center matched panels at each elevation.
   2. Provide sequence matching across each elevation.
   3. Carry figure of cabinet fronts to toe kicks.

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

H. Toe Kicks: Fixed cabinet toe kicks are constructed of 3/4 inch (19 mm) exterior grade oriented strand board with 2 inch by 4 inch (50 mm by 102 mm) fir stringers. Bases are leveled and anchored to the floor in continuous lengths to ensure straight and true lines of casework. Rubber, vinyl, tile or other finished base shall be furnished and installed by others.

I. Laminate Faced Cabinets:
   1. Case Body:
      a. Ends: Case ends shall be 3/4 inch (19mm) thick combination core. Exposed exterior cabinet ends shall be laminated with VGS laminate. Concealed ends shall be laminated with BKL laminate. Interior surfaces shall be laminated with CLS laminate. Exposed edges shall be edged with PVC edge-banding. Holes shall be drilled for adjustable shelf supports at 32 mm (1 1/4 inch) centers.
   2. Cabinet Top and Bottom:
      a. Base and tall cabinet top and bottoms shall be 3/4 inch (19 mm) thick combination core. Exposed sides shall be laminated with CLS laminate and concealed sides shall be laminated with BKL laminate.
      b. Wall cabinet top and bottom shall be 1 inch (25 mm) thick for all cabinets. Laminated with CLS laminate on both sides.
      c. All edges shall be banded with PVC edge-banding.
   3. Fixed and Adjustable Shelves:
      a. All shelves shall be 1 inch (25 mm) thick combination core board laminated with CLS laminate on both sides.
      b. All exposed edges shall be banded with PVC edge-banding.
      c. All shelves to be adjustable on 1 1/2 inch (38 mm) centers.
   4. Cabinet Backs:
      a. Cabinet backs shall be 1/4 inch (6 mm) thick hardboard laminated with CLS laminate for use in cabinets with or without doors and shall be recessed into ends and sides.
      b. Exposed backs shall be 3/4 inch (19 mm) thick combination core with CLS laminate on interior and VGS laminate on exterior surface.
   5. Doors and Drawer Fronts:
      a. Plastic Laminate Doors and Drawer Fronts: Plastic laminate doors and drawer fronts shall be 3/4 inch (19 mm) thick with VGS laminate on exterior face and CLS laminate on interior face.
      b. Doors and drawer fronts shall be edged with PVC edge-banding.
   6. Drawers:
      a. Drawer box sides, backs, and sub-fronts shall be 5/8 inch (16 mm) thick combination core laminated with CLS laminate. All edges shall be banded with PVC edge-banding.
      b. Drawer bottoms shall be 1/4 inch (6 mm) thick hardboard or combination core laminated with CLS laminate recessed into the sides, backs, and sub-front.
      c. Paper storage drawers shall be fitted with a hood at back of paper retainage and shall have a 1/2 inch (13 mm) thick reinforced bottom.
      d. Drawer fronts shall be mounted with adjusting mechanism to allow complete adjustability and alignment in the field.

2.14 SHOP FINISHING

A. 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 - 7, Vinyl, Catalyzed.
      b. Stain: As selected by Architect.
      c. Sheen: Satin.
B. Finish components including casework, paneling, and trim at the same time in the same facility

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify adequacy and proper location of any required backing and support framing.
B. Verify that mechanical, electrical, plumbing, and other building components affecting work in this Section are in place and ready.

3.02 INSTALLATION

A. Install work in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS) requirements for grade indicated.
B. Secure all cabinets in accordance with Seismic Design Category D requirements, ICC (IBC).
C. Set and secure all casework in place, assuring that they are rigid, plumb, and level.
D. Carefully scribe casework abutting other components, with maximum gaps of 1/32 inch. Do not use additional overlay trim for this purpose.
E. All casework items shall be securely anchored to building structure, except for those items identified as "mobile" or "moveable" on drawings, which are to be adjusted to prevent any rocking when sitting on finish floor.
F. Primary anchorage of base and wall cabinets shall be through the cabinet back into wall framing or blocking furnished under other sections. Additional anchorage will be made into cabinet bases and adjacent side walls where they occur. Appropriate sized anchor screws shall be used to best attach to the existing wall condition which will allow each cabinet to be loaded to a capacity of 50 lbs. per sq. ft. of shelf area.
G. At free-spanning countertops or work surfaces, steel support brackets shall be provided at a maximum spacing of 32 inches (812 mm), or as shown on drawings. Support brackets are to be designed to allow for knee space clearance and attach to wall framing for support.
H. Secure cabinets to floor using appropriate angles and anchorages.
I. Countersink anchorage devices at exposed locations. Conceal with solid wood plugs of species to match surrounding wood; finish flush with surrounding surfaces.
J. Site glaze glass materials using the Interior Dry method specified in Section 08 8000.
K. Mechanical fasteners used at exposed and semi-exposed surfaces, excluding installation attachment screws and those securing cabinets end to end, shall be countersunk.
L. Equipment cutouts shown on plans shall be cut by the installer.

3.03 COORDINATION

A. Verify requirements and location from architect before cutting holes for paper slots and grommets.
B. Provide cutting and fitting as necessary to accommodate mechanical and electrical work built into casework units.
C. Provide alterations to casework to keep devices accessible when they are covered by casework. This includes mechanical and electrical switches, receptacles, panels, access doors and other devices.

3.04 CAULKING

A. Joint Cleaning: Apply sealant to clean, dry surface free from grease, oil, wax or other foreign matter tending to destroy or impair adhesion. Clean and prime in accordance with sealant manufacturer's instructions if required.
B. Application: Apply sealants strictly in accordance with manufacturer's instructions and supervision, by manufacturer approved applicator. Provide technical field assistance by manufacturers to ensure proper mixing of sealants, cleaning of surfaces and application of materials.
C. Cleaning and Protection: Carefully protect adjoining surfaces from staining. Immediately remove any material on surfaces not to receive sealant and restore finish as required. Where cleaning and restoration is not acceptable, remove affected work and provide new work conforming to applicable requirements as directed at Contractor's expense.
D. Fill joints partially with closed cell expanded backing using only compatible materials until joint width does not exceed joint depth. Apply sealant under sufficient pressure to completely fill voids. Finish exposed joints smooth, flush with surface or recessed as shown.

3.05 ADJUSTING AND TOUCH UP

A. Before completion of the installation, the installer shall adjust all moving and operating parts to function smoothly and correctly.
B. All nicks, chips, and scratches in the finish shall be filled and retouched. Damaged items that cannot be repaired shall be replaced.
C. Test installed work for rigidity and ability to support loads.

3.06 CLEANING

A. All casework shall be broom cleaned. All debris, including packaging and scraps, shall be removed to the appropriate job waste dump.
B. This Contractor shall clean interiors and exteriors of the cabinets repairing all scratches, buffs, etc., using factory-approved cleaning and polishing solutions.
C. Damaged surfaces which cannot be repaired properly shall be replaced as directed by the Architect and at no additional cost to the Owner.
D. Upon completion of installation, the installer shall clean all installed items of pencil and ink marks and broom clean the area of operation.

SECTION 06 6116

SOLID SURFACING FABRICATIONS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Furnish all labor, materials, equipment, tools and services required to fully complete all Solid Surfacing Fabrication work as is indicated on the drawings and/or specified herein including, but not limited to, the following described items.
B. Countertops with splash.
   1. Integral sinks.
      a. Locations: Science rooms and associated prep. rooms.
   2. Undermount sinks as specified in Division 22 - Plumbing.
C. Windowsills.
D. Wall caps.
E. Sealants related to this section.
F. Do not include sales tax, refer to Section 00 1115 - Advertisement for Prequalification of Bidders

1.02 RELATED REQUIREMENTS

A. Section 05 5000 - Metal Fabrications: Blocking.
B. Section 06 1000 - Rough Carpentry: Blocking.
C. Section 06 4100 - Architectural Wood Casework.
D. Division 22 - Plumbing: Plumbing fixtures.
E. Division 26 - Electrical: Electrical fixtures.

1.03 REFERENCE STANDARDS

A. ANSI Z124.3 - American National Standard for Plastic Lavatories; 2005.
B. ANSI Z124.4 - Plastic Water Closet Bowls and Tanks; 2006.
C. ANSI Z124.6 - American National Standard for Plastic Sinks; 2007.
D. ASTM D638 - Standard Test Method for Tensile Properties of Plastics; 2014.
E. ASTM D785 - Standard Test Method for Rockwell Hardness of Plastics and Electrical Insulating Materials; 2008 (Reapproved 2015).
F. ASTM D790 - Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials; 2017.
G. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2021a.
H. ASTM G21 - Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi; 2015, with Editorial Revision (2021).
I. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards, 2nd Edition; 2014, with Errata (2016).
J. NEMA LD 3 - High-Pressure Decorative Laminates; 2005.
K. NFPA 255 - Standard Method of Test of Surface Burning Characteristics of Building Materials; 2006.
L. NSF 51 - Food Equipment Materials; 2017.
M. UL 723 - Standard for Test for Surface Burning Characteristics of Building Materials; Current Edition, Including All Revisions.

1.04 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.
B. Coordination: Coordinate the installation of solid surface fabrications with size, location and installation of service utilities and casework. Site verify all dimensions.

1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Product Data: Indicate product description, fabrication information and compliance with specified performance requirements.
C. Shop Drawings:
    1. Show location of each item, dimensioned plans and elevations, large scale details, attachment devices and other components.
        a. Show full-size details, edge details, thermoforming requirements, and attachments.
        b. Show locations and sizes of furring, blocking, including concealed blocking and reinforcement specified in other Sections.
        c. Show locations and sizes of cutouts and holes for plumbing fixtures, faucets, soap dispensers, waste receptacle and other items installed in solid surface.
    2. Countertops and Splashes: Submit shop drawings in conformance to AWS Section 1 - Submittals. The first page of the original shop drawings shall bear a Woodwork Institute Certified Compliance Label. For further information visit: www.woodworkinstitute.com.
D. Samples: Submit 6 inch by 6 inch (150 mm by 150 mm) sample in specified gloss. Cut sample and seam together for representation of inconspicuous seam.
    1. Indicate full range of color and pattern variation.
E. Maintenance Data: Submit manufacturer's care and maintenance data, including repair and cleaning instructions.
F. Warranty: Submit manufacturer warranty and ensure that forms have been completed in Murray City School District '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. Maintenance kit for finishes.

1.06 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than five years of documented experience.
B. Fabricator/Installer Qualifications: Company specializing in performing the work of this section with minimum five years of experience.
C. Countertops and Splashes:
    1. Fabrication and installation shall be in accordance with Premium Grade of the AWI/AWMAC/WI (AWS)
    2. Certified Compliance:
        a. Each countertop shall bear a Woodwork Institute Certified Compliance Label.
        b. Replace, repair, or rework all work for which certification is refused at no cost to the Owner.
        c. It is the responsibility of the fabricator/installer to include within their bid, any and all cost for certified compliance. Issuance of a Certified Compliance Certificate is a prerequisite for final acceptance. For further information visit www.woodworkinstitute.com.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Deliver all solid polymer fabrications to site ready for installation. Deliver in protective packing so as to prevent any potential damage to work prior to installation. Do not deliver any materials to site until areas are ready to receive them for installation. Store all materials indoors in a dry area away from extreme temperatures. Store flat materials in vertical racks with edges protected or flat on padded pallets.

1.08 FIELD CONDITIONS

A. Maintain relative humidity planned for building occupants and an ambient temperature between 65 and 75 degrees F for 48 hours prior to and during installation. After installation, maintain relative humidity and ambient temperature planned for building occupants.

1.09 WARRANTY

A. The Contractor shall guarantee his work for a period of One (1) year from date of Substantial Completion. Guarantee shall be on form included in Section 01 7800.
B. Provide manufacturer’s warranty against defects in materials.
   1. Warranty shall provide material and labor to repair or replace defective materials.
   2. Warranty Period: Ten years from date of Substantial Completion.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Dupont: www.corian.com.
B. Formica Corporation: www.formica.com.
C. Avonite Surfaces: www.avonitesurfaces.com.
D. Wilsonart International, Inc: www.wilsonartcontract.com.
E. LG hausys; Hi-Macs: www.lghausys.com.
F. Samsung Staron: www.staron.com.
G. Substitutions: See Section 01 6000 - Product Requirements.

2.02 MATERIALS

A. Solid Polymer:
   1. Cast, nonporous, filled polymer, not coated, laminated or of composite construction with through body colors meeting ANSI Z124.3 or ANSI Z124.4, having minimum physical and performance properties specified.
   2. Superficial damage to a depth of 0.010 inch (.25 mm) shall be repairable by sanding and/or polishing.
   3. Finish:
      a. Matte; gloss range of 5 - 20.
      b. Provide surfaces with a uniform finish.
   4. Performance Characteristics:
      a. Tensile Strength: 6,000 psi, ASTM D638.
      b. Tensile Elongation: 0.4 percent minimum, ASTM D 638.
      c. Flexural Strength: 10,000 psi, ASTM D790
      d. Hardness: >85, Rockwell "M" Scale - ASTM D785.
      e. Light Resistance: (Xenon Arc) No effect, NEMA LD 3, Method 3.3.
      f. Wear and Cleanability: Passes, ANSI Z124.3 & ANSI Z124.6.
      g. Stain Resistance: Passes, ANSI Z124.3 & Z124.6.
      h. Fungus and Bacteria Resistance: Does not support microbial growth,ASTM G21
      i. High Temperature Resistance: No Change, NEMA LD 3, Method 3.6.

j. Flammability: Class I and Class A, ASTM E84, NFPA 255, UL 723.
k. Flame Spread Index: <25.
l. Smoke Developed Index: <25.

2.03 COMPONENTS

A. Quality Grade: Unless otherwise indicated provide Countertops and Splashes of quality specified by AWI//AWMAC/WI Architectural Woodwork Standards for Premium Grade.
B. Windowsills: 1/2 inch (13 mm) thick, depth and length as shown on drawings or as indicated by Architect.
   1. Colors: As selected by Architect from Manufacturer's full color line, including premium.
   2. Exposed Edge Treatment: Built up to minimum 1 inch (26 mm) thick; square edge.
C. Wall Caps: 1/2 inch (13 mm) thick, depth and length as shown on drawings or as indicated by Architect.
   1. Colors: As selected by Architect from Manufacturer's full color line, including premium.
   2. Exposed Edge Treatment: Built up to minimum 1 inch (26 mm) thick; square edge.
D. Countertops and Splash: 1/2 inch (13 mm) thick, depth and length as shown on drawings or as indicated by Architect.
   1. Colors: As selected by Architect from Manufacturer's full color line, including premium.
   2. Exposed Edge Treatment: Built up to minimum 1 1/4 inch (32 mm) thick; and as detail on drawings.
   3. Back and End Splashes: Same sheet material, square top; 4 inches (102 mm) high.
   4. Skirts: As indicated on drawings.
E. Integral Sink: Minimum 3/4 inch (19 mm) wall thickness; comply with ANSI Z124.3.
   1. Style: As selected by Architect from manufacturers full range.
   2. Color: As selected by Architect from manufacturers full range.
F. Note: Color selections may be different for each component/area. Allow for a minimum of 4 color choices.

2.04 FINISHES

A. Color:
   1. As selected by Architect from Manufacturer's entire color line. Up to four colors to be selected.
B. Finish:
   1. Matte; gloss range of 5 - 20.
   2. Provide surfaces with a uniform finish.

2.05 ACCESSORIES

A. Joint Adhesive:
   1. Manufacturer's recommended one or two part adhesive kit to create inconspicuous, nonporous joints.
B. Sealant:
   1. Manufacturer's recommended mildew resistant, FDA-compliant, NSF 51 compliant (food zone - any type), UL listed silicone sealant in colors matching components.
C. Sink Mounting Hardware:
   1. Manufacturer's recommended bowl clips, panel inserts and fasteners for attachment of undermount sinks.
D. Conductive Tape:
   1. Manufacturer's recommended aluminum foil tape, with required thickness, for use with cutouts near heat sources.
E. Insulating Felt Tape:

1. Manufacturer's recommended for use with conductive tape in insulating solid surface material from adjacent heat source.

2.06 FACTORY FABRICATION

A. Fabricate Countertops and Splashes in conformance with the Architectural Woodwork Standards, latest edition.
   1. Conform to AWS Premium Grade.
B. Shop Assembly:
   1. Fabricate components to greatest extent practical to sizes and shapes indicated, in accordance with approved shop drawings, field measurements, and manufacturer's printed instructions and technical bulletins.
   2. Form joints between components using manufacturer's recommended joint adhesive without conspicuous joints.
      a. Reinforce with strip of solid polymer material, 2 inches (51 mm) wide.
   3. Provide factory cutouts for plumbing fittings as indicated on the drawings.
   4. Rout and finish component edges with clean, sharp returns.
      a. Rout cutouts, radii and contours to template.
      b. Smooth edges.
      c. Repair or reject defective and inaccurate work.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine substrates and conditions, with fabricator present for compliance with requirements for installation tolerances and other conditions affecting performance of work.
B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION

A. Install Countertops and Splashes in conformance with the AWI/AWMAC/WI (AWS)
   1. Installation shall conform to AWS Premium Grade.
B. Install other components plumb, level and rigid, scribed to adjacent finishes, in accordance with approved shop drawings and product data.
   1. Provide product in the largest pieces available.
   2. Form field joints using manufacturer's recommended adhesive, with joints inconspicuous in finished work.
   3. Exposed joints/seams shall not be allowed.
   4. Reinforce field joints with solid surface strips extending a minimum of 1 inch (25 mm) on either side of the seam with the strip being the same thickness as the top.
   5. Cut and finish component edges with clean, sharp returns.
   6. Rout radii and contours to template.
   7. Anchor securely to base cabinets or other supports.
   8. Align adjacent countertops and form seams to comply with manufacturer's written recommendations using adhesive in color to match countertop.
   9. Carefully dress joints smooth, remove surface scratches and clean entire surface.
   10. Install countertops with no more than 1/8 inch (3 mm) sag, bow or other variation from a straight line.
C. Applied Splashes:
   1. Install applied splashes using manufacturer's standard color matched silicone sealant.
   2. Adhere applied splashes to countertops using manufacturer's standard color matched silicone sealant.
D. Coved Splashes:

1. Provide coved splashes at all walls and adjacent millwork.
2. Fabricate radius cove at intersection of counters with splashes to dimensions shown on drawings or as directed by the Architect.
3. Adhere to countertops using manufacturer's standard color matched Joint Adhesive.

E. Integral Sinks:
1. Provide solid surface materials bowls with overflows in locations shown on drawings or as directed by the Architect.
2. Secure sinks to tops using manufacturer's recommended sealant, adhesive and mounting hardware to maintain warranty.

F. Countertops and Bookshelf Tops:
1. Adhesively joined with no exposed open or silicone filled seams.
2. Reinforce edges and cutouts as recommended by the manufacturer.
3. Set securely into place using only concealed fasteners and manufacturer's recommended adhesive.

G. Windowsills:
1. Install windowsills full length of window, set securely into place using only concealed fasteners and manufacturer's recommended adhesive.
2. Windowsills shall be plumb, true and level.
3. Provide minimum of 1/8 inch (3 mm) expansion gaps on both sides of sill, sealed with manufacturer's recommended sealant.

H. Wall Caps:
1. Install wall caps full length of wall or as shown on drawings, set securely into place using only concealed fasteners and manufacturer's recommended adhesive.
2. Wall caps shall be plumb, true and level.
3. Provide minimum of 1/8 inch (3 mm) expansion gaps at intersections with vertical surfaces, sealed with manufacturer's recommended sealant.

3.03 REPAIR

A. Repair or replace damaged work which cannot be repaired to Architect's satisfaction.

3.04 CLEANING AND PROTECTION

A. Keep components clean during installation.
B. Remove adhesives, sealants and other stains.

END OF SECTION 06 6116

SECTION 07 1300

SHEET WATERPROOFING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Furnish all labor, materials, equipment, tools, and services required to fully complete all Sheet Waterproofing work as is indicated on the drawings and/or specified herein including, but not limited to, the following described items.
B. Waterproofing:
   1. Sheet Waterproofing:
      a. Self-adhered modified bituminous sheet membrane.
C. Drainage/Protection Composite Panel.
D. Do not include sales tax, refer to Section 00 1115 - Advertisement for Prequalification of Bidders.

1.02 RELATED REQUIREMENTS

A. Section 03 1000 - Concrete Forming and Accessories.
B. Section 03 3000 - Cast-in-Place Concrete: Concrete substrate and waterstops.
C. Section 07 6200 - Sheet Metal Flashing and Trim: Metal parapet, coping, and counterflashing.

1.03 REFERENCE STANDARDS

A. ASTM C836/C836M - Standard Specification for High Solids Content, Cold Liquid-Applied Elastomeric Waterproofing Membrane for Use with Separate Wearing Course; 2018 (Reapproved 2022).
B. ASTM D412 - Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers--Tension; 2016 (Reapproved 2021).
C. ASTM D570 - Standard Test Method for Water Absorption of Plastics; 1998 (Reapproved 2018).
D. ASTM D882 - Standard Test Method for Tensile Properties of Thin Plastic Sheeting; 2018.
E. ASTM D903 - Standard Test Method for Peel or Stripping Strength of Adhesive Bonds; 1998 (Reapproved 2017).
F. ASTM D1876 - Standard Test Method for Peel Resistance of Adhesives (T-Peel Test); 2008, with Editorial Revision (2015).
G. ASTM D1970/D1970M - Standard Specification for Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection; 2021.
H. ASTM D5295/D5295M - Standard Guide for Preparation of Concrete Surfaces for Adhered (Bonded) Membrane Waterproofing Systems; 2018.
I. ASTM D5385/D5385M - Standard Test Method for Hydrostatic Pressure Resistance of Waterproofing Membranes; 2020.
J. ASTM E96/E96M - Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials; 2021.
K. 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 (Reapproved 2019).
L. NRCA (WM) - The NRCA Waterproofing Manual; 2021.

1.04 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.

1. Establish procedures to maintain optimum working conditions and to coordinate this work with related and adjacent work. Agenda for meeting shall include review of special details and flashing.

1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.
B. Product Data: Submit manufacturer’s product data, installation instructions, use limitations and recommendations.
C. Shop Drawings: Indicate special joint or termination conditions and conditions of interface with other materials.
D. Samples: Submit one 6 inch by 6 inch (150 mm by 150 mm) sample of the following for approval:
   1. Sheet membrane.
   2. Protection board.
E. Certificate: Certify that products meet or exceed specified requirements.
F. Manufacturer's Installation Instructions: Indicate special procedures, perimeter conditions requiring special attention, and acceptable installation temperatures.
G. Warranty: Submit manufacturer warranty and ensure forms have been completed in Murray City School District 's name and registered with manufacturer.

1.06 QUALITY ASSURANCE

A. Manufacturer: Sheet membrane waterproofing system shall be manufactured and marketed by a firm with a minimum of 20 years experience in the production and sales of self-adhesive sheet membrane waterproofing. Manufacturers proposed for use but not named in these specifications shall submit evidence of ability to meet all requirements specified, and include a list of projects of similar design and complexity completed within the past 5 years.
B. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with no less than three years of documented experience.
C. Installer Qualifications: Company specializing in performing the work of this section with minimum five years documented experience and approved by the manufacturer.
D. Materials: For each type of material required for the work of this section, provide primary materials which are the products of one manufacturer.

1.07 DELIVERY, STORAGE AND HANDLING

A. Deliver materials and products in labeled packages. Store and handle in strict compliance with manufacturer’s instructions, recommendations and material safety data sheets. Protect from damage from sunlight, weather, excessive temperatures and construction operations. Remove damaged material from the site and dispose of in accordance with applicable regulations.
   1. Do not double-stack pallets of membrane on the job site. Provide cover on top and all sides, allowing for adequate ventilation.
   2. Protect mastic and adhesive from moisture and potential sources of ignition.
   3. Store drainage composite or protection board flat and off the ground. Provide cover on top and all sides.
   4. Protect surface conditioner from freezing.
B. Sequence deliveries to avoid delays, but minimize on-site storage.

1.08 FIELD CONDITIONS

A. Perform work only when existing and forecasted weather conditions are within the limits established by the manufacturer of the materials used. Proceed with installation only when the substrate construction and preparation work is complete and in condition to receive sheet membrane waterproofing.

1.09 WARRANTY

A. See Section 01 7800 - Closeout Submittals for additional warranty requirements.
B. Contractor to correct defective Work within period of five years after Date of Substantial Completion; remove and replace materials concealing waterproofing at no extra cost to Owner.
C. Provide five year manufacturer warranty from date of Substantial Completion for waterproofing failing to resist penetration of water , except where such failures are the result of structural failures of building. Hairline cracking of concrete due to temperature change or shrinkage is not considered a structural failure.

PART 2 PRODUCTS

2.01 SHEET WATERPROOFING APPLICATIONS

A. Self-Adhered Sheet Waterproofing:
    1. Use at the following areas:
        a. Elevator Pit.
    2. Cover with protection board.

2.02 SHEET WATERPROOFING MATERIALS

A. Self-Adhered Sheet Membrane: Self-adhesive, cold-applied composite sheet consisting of a thickness of 1.4 mm (0.056 inch) of rubberized asphalt and 0.1 mm (0.004 inch) of cross-laminated, high density polyethylene film.
    1. Tensile Strength:
        a. Film: 5,000 psi, minimum, measured in accordance with ASTM D882 and at grip-separation rate of 2 inches per minute.
        b. Membrane: 325 psi, minimum, measured in accordance with ASTM D412 Method A, using die C and at spindle-separation rate of 2 inches per minute.
    2. Elongation at Break: 300 percent, minimum, measured in accordance with ASTM D412.
    3. Water Vapor Permeance: 0.05 perm, maximum, measured in accordance with ASTM E96/E96M.
    4. Low Temperature Flexibility: Unaffected when tested in accordance with ASTM D1970/D1970M at minus 20 degrees F, 180 degree bend on 1 inch mandrel.
    5. Water Absorption: 0.1 percent increase in weight, maximum, measured in accordance with ASTM D570, 24 hour immersion.
    6. Hydrostatic Pressure Resistance: Membrane resists leakage for at least one hour from pressure equivalent to 200 feet head of water applied in accordance with test method ASTM D5385/D5385M.
    7. Surface Conditioner, Mastic, Liquid Membrane, Adhesives, Sealants, Tapes, Waterstops, and Accessories: As recommended by membrane manufacturer.
    8. Manufacturers:
        a. Sika - SikaBit; www.wrmeadows.com.
        b.
        c. Carlisle Coatings & Waterproofing Incorporated; Product - MiraDRI 860/861: www.carlisle-ccw.com.
        d. GCP Applied Technologies; Bituthene® System 4000: www.gcpat.com.

e. Henry Company; Blueskin WP 200: www.henry.com.
f. W.R. Meadows, Inc; Product - "Mel-Rol": www.wrmeadows.com.
g. Substitutions: See Section 01 6000 - Product Requirements.

2.03 ACCESSORIES

A. Sealant for Cracks and Joints In Substrates: Resilient elastomeric joint sealant compatible with substrates and waterproofing materials.
B. Drainage/Protection Composite Panel: Preformed geocomposite drainage sheet system.
C. Flexible Flashings: Type recommended by membrane manufacturer.
D. Sealants: Type recommended by membrane manufacturer.
E. Counterflashings: Pre-Finished Galvanized Steel as specified in Section 07 6200.
F. Termination Bars: Stainless steel; compatible with membrane and adhesives.
G. Surface Conditioner: As recommended by membrane manufacturer.
H. Adhesives: As recommended by membrane manufacturer.

PART 3 EXECUTION

3.01 EXAMINATION

A. The installer shall examine conditions of substrates and other conditions under which this work is to be performed and notify the contractor, in writing, of circumstances detrimental to the proper completion of the work. Do not proceed with work until unsatisfactory conditions are corrected.
B. Verify that items penetrating surfaces to receive waterproofing are securely installed.

3.02 PREPARATION

A. Refer to manufacturer’s literature for requirements for preparation of substrates. Ensure that surfaces are structurally sound and free of voids, spalled areas, loose aggregate and sharp protrusions. Remove contaminants such as grease, oil and wax from exposed surfaces. Remove dust, dirt, loose stone and debris. Use repair materials and methods that are acceptable to manufacturer of sheet membrane waterproofing.
B. Cast-In-Place Concrete Substrates:
   1. Do not proceed with installation until concrete has properly cured and dried (minimum 7 days for normal structural concrete and minimum 14 days for lightweight structural concrete).
   2. Fill form tie rod holes with concrete and finish flush with surrounding surface.
   3. Repair bugholes over 13 mm (0.5 inch) in length and 6 mm (0.25 inch) deep and finish flush with surrounding surface.
   4. Remove scaling to sound, unaffected concrete and repair exposed area.
   5. Grind irregular construction joints to suitable flush surface.
C. Related Materials: Treat joints and install flashing as recommended by waterproofing manufacturer.
D. Protect adjacent surfaces from damage not designated to receive waterproofing.
E. Clean and prepare surfaces to receive waterproofing in accordance with manufacturer's instructions.
F. Do not apply waterproofing to surfaces unacceptable to membrane manufacturer.
G. Concrete Surfaces for Adhesive Bonding: Prepare concrete substrate in accordance with ASTM D5295/D5295M.
   1. Remove substances that inhibit adhesion including form release agents, curing compounds admixtures, laitance, moisture, dust, dirt, grease and oil.

2. Repair surface defects including honeycombs, fins, tie holes, bug holes, sharp offsets, rutted cracks, ragged corners, deviations in surface plane, spalling and delaminations, as described in reference standard.
3. Remove and replace areas of defective concrete; see Section 03 3000.
4. Prepare concrete for adhesive bonded waterproofing using mechanical or chemical methods described in referenced standard.
5. Test concrete surfaces as described in referenced standards, and verify surfaces are ready to receive adhesive bonded waterproofing membrane system.

3.03 INSTALLATION - SHEET MEMBRANE WATERPROOFING SYSTEM

A. Refer to manufacturer’s literature for installation, including but not limited to, the following:
   1. Apply surface conditioner at rate instructed by manufacturer. Recoat areas not waterproofed if contaminated by dust. Mask and protect adjoining exposed finish surfaces to protect those surfaces from excessive application of surface conditioner.
   2. Delay application of membrane until surface conditioner is completely dry. Dry time will vary with weather conditions.
   3. Seal daily terminations with troweled bead of mastic.
   4. Apply protection board and related materials in accordance with manufacturer’s written instructions.
B. Install membrane waterproofing in accordance with manufacturer's instructions and NRCA (WM) applicable requirements.
C. Roll out membrane, and minimize wrinkles and bubbles.
D. Overlap edges and ends, minimum 3 inches, seal permanently waterproof by method recommended by manufacturer, and apply uniform bead of sealant to joint edge.
E. Reinforce membrane with multiple thickness of membrane material over joints, whether joints are static or dynamic.
F. Weather lap joints on sloped substrate in direction of drainage, and seal joints and seams.
G. Coordinate with drain installation;
H. Install at building expansion joints at locations as indicated on drawings.
I. Flexible Flashings: Seal items watertight that penetrate through waterproofing membrane with flexible flashings.
J. Seal membrane and flashings to adjoining surfaces.

3.04 INSTALLATION - DRAINAGE/PROTECTION COMPOSITE PANEL

A. Install composite panel in accordance with manufacturer's instructions.
B. Place composite panel directly against membrane, butt joints, place to encourage drainage downward. Scribe and cut boards around projections, penetrations, and interruptions.
C. Place protection board directly against drainage panel; butt joints. Scribe and cut boards around projections, penetrations, and interruptions.

3.05 FIELD QUALITY CONTROL

A. See Section 01 4000 - Quality Requirements for additional requirements.
B. Owner will provide testing services, and Contractor to provide temporary construction and materials for testing.
C. Upon completion of horizontal membrane installation, dam installation area in preparation for flood testing.
D. Flood to minimum depth of 1 inch with clean water, and after 48 hours inspect for leaks.
E. If leaking is found, remove water, repair leaking areas with new waterproofing materials as directed by Architect; repeat flood test, and repair damage to building.
F. When area is proven watertight, drain water and remove dam.

3.06 CLEANING AND PROTECTION

A. Remove any masking materials after installation. Clean any stains on materials which would be exposed in the completed work.
B. Protect completed membrane waterproofing from subsequent construction activities as recommended by manufacturer.

END OF SECTION 07 1300

SECTION 07 1900

EXTERIOR WATER REPELLENTS AND GRAFFITI RESISTANT SEALERS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Furnish all labor, materials, equipment, tools, and services required to fully complete all Water Repellent and Sealer work as is indicated on the drawings and/or specified herein including, but not limited to, the following items.
B. Surfaces to be treated: exterior masonry and concrete.
    1. Water repellents
        a. Install full height at the following locations:
            1) Exterior building masonry walls.
            2) Exterior building concrete walls.
            3) Exterior masonry site walls.
            4) Exterior accessory building concrete walls.
    2. Anti-graffiti sealer
        a. Install as follows:
            1) Exterior building masonry walls, 12 feet high.
            2) Exterior building concrete walls, 12 feet high.
            3) Exterior masonry site walls, full height.
            4) Exterior accessory building concrete walls, full height.
C. Surface preparation.
D. Do not include sales tax, refer to Section 00 1115 - Advertisement for Prequalification of Bidders.

1.02 RELATED REQUIREMENTS

A. Section 03 4500 - Precast Architectural Concrete.
B. Section 04 0100 - Maintenance of Masonry: Cleaning of existing masonry.
C. Section 04 2731 - Reinforced Unit Masonry.
D. Section 31 1313 - Site Concrete: Exterior horizontal concrete surface sealer.

1.03 REFERENCE STANDARDS

A. ASTM C140/C140M - Standard Test Methods for Sampling and Testing Concrete Masonry Units and Related Units; 2022b.
B. ASTM D3960 - Standard Practice for Determining Volatile Organic Compound (VOC) Content of Paints and Related Coatings; 2005 (Reapproved 2018).
C. ASTM D5095 - Standard Test Method for Determination of the Nonvolatile Content in Silanes, Siloxanes, and Silane-Siloxane Blends Used in Masonry Water Repellent Treatments; 1991 (Reapproved 2022).

1.04 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene a meeting at least one week prior to starting work; require attendance of affected installers; invite Architect and Owner.

1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.
B. Product Data: Provide product description, details of tests performed, limitations, and chemical composition.

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. 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 Water Repellent Material: Two gallons of the each type installed.

1.06 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with miminum three years of documented experience.
B. Installer Qualifications: Company specializing in performing work of type specified and with minimum three years of documented experience
C. Owner reserves the right to provide continuous independent inspection of surface preparation and application of water repellent.

1.07 MOCK-UPS

A. Prepare representative surface 36 by 36 inches 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.
    1. Conduct RILEM test on cured field sample. Allow product to fully cure 5 to 7 days before testing. Adjust application until required repellent performance is achieved.
B. Manufacturer's representative will review technical aspects; surface preparation, application, and workmanship.
C. Obtain Architect's written approval of field sample before start of material application, including approval of aesthetics, color, texture, and appearance.
D. Locate where directed.
E. Mock-up may remain as part of work.

1.08 FIELD CONDITIONS

A. Protect liquid materials from freezing.
B. Do not apply water repellent/sealers when ambient temperature is lower than 50 degrees F or higher than 100 degrees F.
C. Do not apply water repellents/sealers when wind velocity is higher than 15 mph.

1.09 DELIVERY, STORAGE AND HANDLING

A. Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.
B. Store in unopened containers in a cool, dry area. Keep material from freezing in the container; do not store below 35 degrees F (2 degrees C) or above 100 degrees F (38 degrees C).

1.10 WARRANTY

A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
B. Manufacturer shall warrant respective products applied in accordance with manufacturer's specifications for a period of 10 years from date of Substantial Completion, against water intrusion due to material failure. When notified of such conditions, in writing, by the Owner, the manufacturer shall provide materials, and the applicator shall provide the labor to correct said deficiencies promptly and without inconvenience or cost to the Owner.

C. The Contractor shall guarantee his work for a period of One (1) year from date of Substantial Completion. Guarantee shall be on form included in Section 01 7800.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Silane, Siloxane, Silane-Siloxane Blend, and Siliconate Water Repellents:
   1. BASF Construction Chemicals: www.buildingsystems.basf.com.
   2. Concrete Sealers USA: www.concretesealersusa.com.
   3. Dayton Superior Corporation: www.daytonsuperior.com.
   4. Evonik Corporation: www.evonik.com.
   5. Pecora Corporation: www.pecora.com.
   6. PROSOCO, Inc: www.prosoco.com.
   7. The QUIKRETE Companies: www.quikrete.com.
   8. Rust-Oleum Corporation; OKON S-20 Penetrating Silane-Siloxane Water Repellent Sealer: www.rustoleum.com.
   9. Sherwin-Williams Company: www.sherwin-williams.com.
   10. Rainguard International: www.rainguard.com.
   11. L&M Construction Chemicals, Inc.: www.lmcc.com.
   12. Substitutions: See Section 01 6000 - Product Requirements.

2.02 MATERIALS

A. Water Repellent - Exterior masonry, concrete, and precast architectural concrete surfaces. 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. VOC Content: Less than 600 g/L, when tested in accordance with ASTM D3960 or ASTM D5095.
   4. 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.
   5. Maintains dry appearance when wetted.
   6. Water-based siloxane, silane, or blend that reacts chemically with concrete and masonry.
      a. Manufacturers:
         1) BASF Construction Chemicals; MasterProtect H 185 .
         2) Pecora Corporation.
         3) PROSOCO, Inc; Sure Klean Weather Seal H40: www.prosoco.com.
         4) Sherwin-Williams Company; Loxon 7 Percent Siloxane, with VOC of Zero g/L: www.sherwin-williams.com.
         5) Okon, Inc.; Product - OKON S-40: www.okoninc.com.
         6) Substitutions: See Section 01 6000 - Product Requirements.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.
B. Verify joint sealants are installed and cured.
C. 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. Protection of Adjacent Work:
   1. Protect adjacent landscaping, property, and vehicles from drips and overspray.
   2. Protect adjacent surfaces not intended to receive sealer.
B. Prepare surfaces to be coated as recommended by manufacturer for best results.
C. Do not start work until masonry mortar and concrete substrate is cured a minimum of 60 days.
D. Remove loose particles and foreign matter.
E. Remove oil and foreign substances with a chemical solvent that will not affect sealer.
F. Scrub and rinse surfaces with water and let dry.
G. Allow surfaces to dry completely to degree recommended by sealer manufacturer before starting coating work.

3.03 APPLICATION

A. Apply 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 sealer from unintended surfaces immediately by a method instructed by water repellent manufacturer.
E. Provide manufacturer's field service representative to inspect preparation and application work continuously during entire application period to ensure that manufacturer's best practices for preparation and application are being followed.

3.04 FINAL CLEANING

A. Clean site of all unused sealer, residues, rinse water, wastes, and effluents in accordance with environmental regulations.
B. Remove and dispose of all materials used to protect surrounding areas and non-masonry surfaces, following completion of the Work of this Section.
C. Repair, restore, or replace to the satisfaction of the Architect, all materials, landscaping, and non-masonry surfaces damaged by exposure to sealer.

SECTION 07 2100

BUILDING INSULATION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Furnish all labor, materials, equipment, tools and services required to fully complete installation of all Building Insulation as is indicated on the drawings and/or specified herein including, but not limited to, the following described items.
B. Acoustical batt insulation.
C. Board insulation at perimeter foundation wall and masonry cavity walls.
D. Mineral wool insulation at top of wall locations.
E. Board insulation at masonry cavity wall construction and perimeter foundation wall.
F. Mineral wool insulation.
G. Do not include sales tax, refer to Section 00 1115 - Advertisement for Prequalification of Bidders.

1.02 RELATED REQUIREMENTS

A. Section 03 4713 - Tilt-Up Concrete: Insulation at concrete sandwich panels.
B. Section 04 2731 - Reinforced Unit Masonry: Masonry walls enclosing insulation.
C. Section 05 3100 - Steel Decking: Supporting construction for integral acoustical glass fiber board insulation.
D. Section 05 4000 - Cold-Formed Metal Framing: Supporting construction for batt and glass fiber board insulation.
E. Section 07 2119 - Foamed-In-Place Insulation: Plastic foam insulation other than boards.
F. Section 07 2129 - Sprayed Cellulose Acoustical Insulation: Sprayed-on, adhered fibrous insulation.
G. Section 07 2500 - Weather Barriers: Separate air barrier materials.
H. Section 07 5400 - PVC Roofing Performance: Roofing and parapet insulation.
I. Section 07 8400 - Firestopping: Insulation as part of fire-rated through-penetration assemblies.
J. Section 09 2116 - Gypsum Board Assemblies: Supporting construction for batt and glass fiber board insulation.

1.03 REFERENCE STANDARDS

A. ASTM C578 - Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation; 2019.
B. ASTM C665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing; 2017.
C. ASTM C1289 - Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board; 2022.
D. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2021a.
E. ASTM E96/E96M - Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials; 2021.
F. ASTM E136 - Standard Test Method for Assessing Combustibility of Materials Using a Vertical Tube Furnace at 750°C; 2019a.

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. ABAA Field Quality Control Submittals: Submit third-party reports of testing and inspection required by ABAA QAP.
D. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
E. Samples: Provide two 6 inch by 6 inch (150 mm by 150 mm) samples of each type of insulation.
F. Manufacturer's Installation Instructions: Include information on special environmental conditions required for installation and installation techniques.
G. ABAA Manufacturer Qualification: Submit documentation of current evaluation of proposed manufacturer and materials.
H. ABAA Installer Qualification: Submit documentation of current contractor accreditation and current installer certification. Keep copies of contractor accreditation and installer certification on site during and after installation. Present on-site documentation upon request.

1.05 QUALITY ASSURANCE

A. Air Barrier Association of America (ABAA) Quality Assurance Program (QAP); www.airbarrier.org:
   1. Installer Qualification: Use accredited contractor, certified installers, evaluated materials, and third-party field quality control audit.
   2. Manufacturer Qualification: Use evaluated materials from a single manufacturer regularly engaged in air barrier material manufacture. Use secondary materials approved in writing by primary material manufacturer.

1.06 FIELD CONDITIONS

A. Do not install insulation adhesives when temperature or weather conditions are detrimental to successful installation.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Protect insulation materials from physical damage and from deterioration due to moisture, soiling and other sources. Store inside and in a dry location. Comply with manufacturer’s written instruction for handling, storing, and protecting during installation.
B. Protect foam-plastic board insulation as follows:
   1. Do not expose to sunlight except to necessary extent for period of installation and concealment.
   2. Protect against ignition at all times. Do not deliver foam-plastic board materials to Project site until just before installation time.
   3. Quickly complete installation and concealment of foam-plastic board insulation in each area of construction.

1.08 GUARANTEE

A. The Contractor shall guarantee his work for a period of One (1) year from date of Substantial Completion. Guarantee shall be on form included in Section 01 7800.

PART 2 PRODUCTS

2.01 APPLICATIONS

A. Insulation at Perimeter of Foundation: Extruded polystyrene board.
B. Insulation Inside Masonry Cavity Walls: Polyisocyanurate board.
C. Insulation Over Metal Stud Framed Walls, Continuous: Polyisocyanurate board.
D. Insulation in Interior Metal Framed Walls: Acoustical batt insulation.

E. Insulation Above Lay-In Acoustical Ceilings and Ceiling Clouds: Acoustical batt insulation.

2.02 FOAM BOARD INSULATION MATERIALS

A. Extruded Polystyrene (XPS) Board Insulation: Extruded polystyrene board; ASTM C578; with either natural skin or cut cell surfaces, and the following characteristics:
   1. Location: Perimeter foundation and at freezer/cooler floor.
   2. Type: ASTM C578, Type IV, 25 psi compressive strength at foundations and 30 psi (208 kPa) at freezer/cooler floor.
   3. Flame Spread Index (FSI): Class A - 0 to 25, when tested in accordance with ASTM E84.
   4. Smoke Developed Index (SDI): 450 or less, when tested in accordance with ASTM E84.
   5. Type and Thermal Resistance, R-value: Type IV, 5.0 (0.88) per 1 inch thickness at 75 degrees F mean temperature.
   6. Board Edges: Square.
   7. Type and Water Absorption: Type IV, 0.3 percent by volume, maximum, by total immersion.
   8. Manufacturers:
      a. Dow Chemical Company; STYROFOAM Score Board www.dow.com.
      b. Kingspan Insulation LLC; GreenGuard XPS Type IV, 25 psi: www.kingspan.com.
      c. Owens Corning Corporation; FOAMULAR Extruded Polystyrene (XPS) Insulation: www.ocbuildingspec.com.

B. Polyisocyanurate (ISO) Board Insulation: Rigid cellular foam, complying with ASTM C1289.
   1. Classifications:
      a. Type I: Faced with aluminum foil on both major surfaces of the core foam.
         1) Class 1 - Non-reinforced core foam.
         2) Compressive Strength: 16 psi, minimum.
         3) Thermal Resistance, R-value: At 1-1/2 inch thick; 9.0 at 75 degrees F.
   2. Location: Brick cavity walls and as an alternate under metal panels
   3. Flame Spread Index (FSI): Class A - 0 to 25, when tested in accordance with ASTM E84.
   4. Smoke Developed Index (SDI): 450 or less, when tested in accordance with ASTM E84.
   5. Water Vapor Permeance: 1.2 perm, maximum, at 1 inch thickness, and when tested in accordance with ASTM E96/E96M, desiccant method.
   6. Board Size: 48 inch by 96 inch.
   7. Board Thickness: 1.0, 1.5 and 2.0 inch as noted on drawings.
   8. Board Edges: Square.
   9. Manufacturers:
      a. Atlas Roofing Corporation; ACFoam-II Polyiso Roof Insulation: www.atlasroofing.com.
      b. Carlisle Coatings & Waterproofing, Inc; R2+ Matte: www.carlisleccw.com.
      c. Dow Chemical Company; THERMAX Brand: www.dowbuildingsolutions.com.
      d. Hunter Panels (CH#243323): www.hunterpanels.com.
      e. Hunter Panels; Xci Foil (Class A): www.hunterpanels.com.
      f. 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. Glass Fiber Batt Insulation: Flexible preformed batt or blanket, complying with ASTM C665; friction fit.
   1. Flame Spread Index: 25 or less, when tested in accordance with ASTM E84.
   2. Smoke Developed Index: 50 or less, when tested in accordance with ASTM E84.
   3. Combustibility: Non-combustible, when tested in accordance with ASTM E136, except for facing, if any.

4. Formaldehyde Content: Zero.
5. Thermal Resistance: R of 13/19.
6. Thickness: 3 1/2 inch, 6 inch (150 mm).
7. Facing: Aluminum foil, flame spread 25 rated; one side.
8. Manufacturers:
    a. Owens Corning Corp: www.ocbuildingspec.com.
    b. CertainTeed Corporation: www.certainteed.com.
    c. Johns Manville: www.jm.com.
    d. Knauf Insulation: www.knaufinsulation.us.
    e. Substitutions: See Section 01 6000 - Product Requirements.

C. Acoustical Glass Fiber Batt Insulation: Flexible preformed batt or blanket, complying with ASTM C665; friction fit.
1. Flame Spread Index: 10 or less, when tested in accordance with ASTM E84.
2. Smoke Developed Index: 10 or less, when tested in accordance with ASTM E84.
3. Combustibility: Non-combustible, when tested in accordance with ASTM E136.
4. Formaldehyde Content: Zero.
5. NRC Value: 1.00.
6. Thickness: 3 1/2 inch.
7. Facing: Unfaced.
8. Manufacturers:
    a. CertainTeed Corporation: www.certainteed.com.
    b. Johns Manville Corporation: www.jm.com.
    c. Owens Corning Corp: www.ocbuildingspec.com
    d. Knauf Insulation: www.knaufinsulation.us.
    e. Substitutions: See Section 01 6000 - Product Requirements.

D. Mineral Fiber Batt Insulation: Flexible or semi-rigid preformed batt or blanket, complying with ASTM C665; friction fit; unfaced flame spread index of 0 (zero) when tested in accordance with ASTM E84.
1. Smoke Developed Index: 0 (zero), when tested in accordance with ASTM E84.
2. Manufacturers:
    a. Johns Manville; MinWool Sound Attenuation Fire Batts:
    b. ROCKWOOL (ROXUL, Inc); COMFORTBATT.
    c. ROCKWOOL (ROXUL, Inc); AFB™.
    d. Thermafiber, Inc; SAFB FF.
    e. Substitutions: See Section 01 6000 - Product Requirements.

2.04 ACCESSORIES

A. Tape joints of rigid insulation in accordance with roofing and insulation manufacturers' instructions.
B. Insulation Fasteners: Lengths of galvanized, 13 gage (0.072 inch) high carbon spring steel with chisel or mitered tips, held in place by tension, length to suit insulation thickness and substrate, capable of securely supporting insulation in place.
C. Insulation Fasteners: Impaling clip of galvanized steel with washer retainerand clips, to be adhered to surface to receive insulation, length to suit insulation thickness and substrate, capable of securely and rigidly fastening insulation in place.
D. Fasteners: Type recommended by insulation manufacturer for application.
E. Adhesive: Type recommended by insulation manufacturer for application.
F. Joint Closure Strips: Type recommended by insulation manufacturer for application.
G. Joint Tape: Type recommended by insulation manufacturer for application.
H. Sealant: 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.
C. Do not begin installation until substrates have been properly prepared.

3.02 BOARD INSTALLATION AT FOUNDATION PERIMETER

A. Install boards horizontally on foundation perimeter.
    1. Install in running bond pattern.
    2. 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.

3.03 BOARD INSTALLATION AT CAVITY WALLS

A. Install boards to fit snugly between wall ties.
B. Install boards horizontally on walls.
    1. Install in running bond pattern.
    2. Butt edges and ends tightly to adjacent boards and to protrusions.
C. Cut and fit insulation tightly to protrusions or interruptions to the insulation plane.

3.04 BATT INSTALLATION

A. Install insulation if required, in accordance with manufacturer's instructions.
B. Install in exterior soffit spaces without gaps or voids. Do not compress insulation.
C. Trim insulation neatly to fit spaces. Insulate miscellaneous gaps and voids.
D. Fit insulation tightly in cavities. Split insulation to fit snug around mechanical and electrical services within the plane of the insulation.
E. Tape or staple insulation batt flanges to framing members.
F. Retain unfaced insulation batts in place with wire mesh secured to framing members.
    1. Use in walls where wall board is installed on one side only.
G. Tape seal butt ends, lapped flanges, and tears or cuts in membrane.
H. Loose-lay insulation on top of acoustical ceiling tiles and between suspension system members. Ensure insulation is in direct contact with ceiling tiles without voids or gaps.

3.05 FIELD QUALITY CONTROL

A. See Section 01 4000 - Quality Requirements, for additional requirements.
B. Jointly with Architect and manufacturer’s representative, visually inspect the rigid foam insulation system application and confirm that the installation is in strict accordance with the manufacturer's recommendations.
C. Ensure exposed or visible applications meet the manufacturer’s standards for uniform appearance.
D. Correct identified defects and irregularities.

3.06 PROTECTION

A. Do not permit installed insulation to be damaged prior to its concealment.

END OF SECTION 07 2100

This page intentionally left blank

SECTION 07 2119

FOAMED-IN-PLACE INSULATION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Furnish all labor, materials, equipment, tools, and services required to fully complete all Foamed-In-Place Insulation work as is indicated on the drawings and/or specified herein including, but not limited to, the following described items.
B. Foamed-in-place insulation:
   1. In exterior framed walls.
   2. In exterior wall crevices.
   3. At junctions of dissimilar wall and roof materials.
C. Ignition barrier or thermal barrier protective coating where can not be covered with gypsum board.
D. Do not include sales tax, refer to Section 00 1115 - Advertisement for Prequalification of Bidders.

1.02 RELATED REQUIREMENTS

A. Section 05 4000 - Cold-Formed Metal Fabrications.
B. Section 07 2100 - Building Insulation.
C. Section 07 2500 - Weather Barriers.
D. Section 09 2116 - Gypsum Board Assemblies.

1.03 REFERENCE STANDARDS

A. ASTM C518 - Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus; 2021.
B. ASTM D2842 - Standard Test Method for Water Absorption of Rigid Cellular Plastics; 2019.
C. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2021a.
D. ASTM E96/E96M - Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials; 2021.
E. ASTM E2178 - Standard Test Method for Determining Air Leakage Rate and Calculation of Air Permeance of Building Materials; 2021a.
F. ICC (IBC) - International Building Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
G. ICC-ES AC377 - ICC-ES Acceptance Criteria for Spray-applied Foam Plastic Insulation; 2011.
H. ICC-ES-ESR 3702 - ICC-ES Evaluation Report DC 315 Coating; 2017.
I. NFPA 286 - Standard Methods of Fire Tests for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth; 2019.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene one week prior to commencing work of this section.

1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.
B. Product Data: Provide product description, insulation properties, overcoat properties, and preparation requirements, along with applicable ICC-ES reports.
C. Certificates: Certify that products of this section meet or exceed specified requirements.

D. Manufacturer's Installation Instructions: Indicate special procedures, and perimeter conditions requiring special attention.
E. Manufacturer Qualification: Submit documentation of current evaluation of proposed manufacturer and materials.

1.06 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products of the type specified in this section, with minimum three years of documented experience.
B. Applicator Qualifications: Company specializing in performing work of the type specified,with minimum five years of documented experience and approved by manufacturer.

1.07 FIELD CONDITIONS

A. Do not apply foam when temperature is below that specified by the manufacturer for ambient air and substrate.
B. Do not apply foam when temperature is within 5 degrees F of dew point.

1.08 GUARANTEE

A. The Contractor shall guarantee his work for a period of One (1) year from date of Substantial Completion. Guarantee shall be on form included in Section 01 7800.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Basis of Design Manufacturer:
   1. Icynene-Lapolla; Icynene ProSeal (MD-C-200 v3): www.icynene.com.
B. Other Approved Manufacturers:
   1. SWD Quick Shield 112: www.swdurethane.com.
   2. Dow Chemical Company: www.dow.com.
   3. BASF Polyurethane Foam Enterprises LLC; Spraytite: www.basf.us.
   4. Carlisle Spray Foam Insulation, SealTite Pro: www.carlislesfi.com.
   5. Demilec LLC; DEMILEC APX: www.demilec.com.
   6. Gaco Western: www.gaco.com.
   7. Henry Company: www.henry.com.
   8. Johns Manville; JM Corbond III Closed Cell Spray Polyurethane Foam: www.jm.com.
   9. NCFI Polyurethanes: www.ncfi.com.
   10. Substitutions: See Section 01 6000 - Product Requirements.

2.02 MATERIALS

A. Foamed-In-Place Insulation: Medium-density, rigid, closed cell polyurethane foam; foamed on-site, using blowing agent of water or non-ozone-depleting gas.
   1. Aged Thermal Resistance: R-value (RSI-value) of 6.4 (degrees F hr sq ft)/Btu minimum, when tested at 1 inch (25.4 mm) thickness in accordance with ASTM C518 after aging for 180 days at 41 degrees F (23 degrees C).
   2. Thickness of applied product: As shown on drawings.
   3. Water Vapor Permeance: Vapor retarder; less than 1 perm, maximum, when tested at intended thickness in accordance with ASTM E96/E96M, dessicant method.
   4. Water Vapor Permeance: Vapor retarder; less than .97 perm, maximum, when tested at intended thickness in accordance with ASTM E96/E96M, dessicant method.
   5. Water Absorption: Less than 2 percent by volume, maximum, when tested in accordance with ASTM D2842.

6. Air Permeance: Less than 0.004 cfm/sq ft, (for 1.5 inches of material) maximum, when tested in accordance with ASTM E283 at 1.5 psf.
7. Closed Cell Content: At least 90 percent.
8. Surface Burning Characteristics: Flame spread/smoke developed index of 25/450, maximum, when tested in accordance with ASTM E84.

2.03 ACCESSORIES

A. Primer: As required by insulation manufacturer.
B. Ignition Barrier Protective Coating: Protective coating complying with the requirements of ICC (IBC) Section 803.1.2 and Section 2603.9 under "Special Approval for Thermal Barriers Over Foam" and NFPA 286 Ignition Barrier per ICC-ES AC377 Appendix X.
   1. Product as recommended by Insulation Manufacturer or:
   2. International Fireproof Technology Inc. DC-315: water-based, intumescent paint, conforming to the following:
      a. Full scale fire resistance test with Icynene ProSeal (MD-C-200v3) in accordance with NFPA 286: 24 wet mils (thermal barrier).
      b. Compatible with MD-C-200 according to ICC-ES-ESR 3702.
      c. Finish: Flat, grey color.
      d. VOC Content: 47 g/L.
      e. Volume Solids: 67 percent.
      f. Flash Point: None.
      g. Mechanism of cure: Coalescence.
      h. Reducer/cleaner: Water.
      i. Collaborative for High Performance Schools (CHPS) Low-emitting material per CA Section 01350 criteria.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify work within construction spaces or crevices is complete prior to insulation application.
B. Verify that surfaces are clean, dry, and free of matter that may inhibit insulation or overcoat adhesion.

3.02 PREPARATION

A. Mask and protect adjacent surfaces from over spray or dusting.
B. Apply primer in accordance with manufacturer's instructions.

3.03 APPLICATION

A. Apply insulation in accordance with manufacturer's instructions.
B. Apply insulation by spray method, to a uniform monolithic density without voids.
C. Apply to a minimum cured thickness as shown on drawings.
D. Apply overcoat to a uniform minimum thickness as needed to achieve fire rating required.
E. Patch damaged areas.
F. Where applied to voids and gaps assure space for expansion to avoid pressure on adjacent materials that may bind operable parts.
G. Trim excess away for applied trim or remove as required for continuous sealant bead.
H. Apply ignition barrier/thermal barrier protective coating in accordance with manufacturer's instructions.

3.04 FIELD QUALITY CONTROL

A. See Section 01 4000 - Quality Requirements for additional requirements.

B. Field inspections and tests will be performed by an independent testing agency.
C. Inspection will include verification of insulation thickness and density.

3.05 PROTECTION

A. Do not permit subsequent construction work to disturb applied insulation.

END OF SECTION 07 2119

SECTION 07 2129

SPRAYED CELLULOSE ACOUSTICAL INSULATION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Furnish all labor, materials, equipment, tools and services required to fully complete all Sprayed Cellulose Acoustical Insulation work as is indicated on the drawings and/or specified herein including, but not limited to, the following described items.
B. Sprayed cellulose acoustical insulation.
C. Locations Auditorium A113 and Little Theater C122.
D. Do not include sales tax, refer to Section 00 0104 - Notice to Contractors.

1.02 REFERENCE STANDARDS

A. ASTM C1149 - Standard Specification for Self-Supported Spray Applied Cellulosic Thermal Insulation; 2017.
B. ASTM C739 - Standard Specification for Cellulosic Fiber Loose-Fill Thermal Insulation; 2021a.
C. ASTM E736/E736M - Standard Test Method for Cohesion/Adhesion of Sprayed Fire-Resistive Materials Applied to Structural Members; 2019.
D. ASTM E759/E759M - Standard Test Method for Effect of Deflection on Sprayed Fire-Resistive Material Applied to Structural Members; 1992 (Reapproved 2020).
E. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2021a.
F. ICC (IBC) - International Building Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
G. ISO 9001 - Quality management systems -- Requirements; 2015.
H. UL 723 - Standard for Test for Surface Burning Characteristics of Building Materials; Current Edition, Including All Revisions.

1.03 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Submit product data that the product meets or exceeds the following specified requirements.
    1. Bond strength shall be greater than 100 psf per ASTM E736/E736M.
    2. Product shall be Class 1 Class A per ASTM E84/UL 723.
    3. Non-corrosive per ASTM C739.
    4. Bond Deflection per ASTM E759/E759M: 6" Deflection in 10' Span - No Spalling or Delamination.
    5. Comply with ICC (IBC) Sectioni 803 requirements for interior finishes.
    6. Meet ASTM C1149.
C. Manufacturer's written certification that product contains no asbestos, fiberglass or other man-made mineral fibers.
D. Copy of manufacturer's ISO 9001: 2008 Certification.
E. Minimum Fiber Recycled Content to be 75%.
F. Cannot contain any Urea-Formaldehyde Resins.
G. Manufacturer's Installation Instructions: Indicate special procedures, perimeter conditions requiring special attention.

1.04 QUALITY ASSURANCE

A. Manufacturer must have a current listing with ICC (IBC).

B. Manufacturer must be in compliance with the ICC (IBC).
C. Manufacturer must be ISO 9001:2008 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. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years of documented experience.
G. Products Specified by Flammability or Combustibility Criteria: Listed and classified by Underwriters Laboratories Inc.

1.05 MOCK-UP

A. Apply 100 square foot representative sample to be reviewed by the Architect and/or Owner prior to proceeding.
B. Locate where directed.
C. Mock-up may remain as part of the Work.

PART 2 PRODUCTS

2.01 SPRAYED CELLULOSE ACOUSTICAL INSULATION

A. Basis-of-Design Product: Subject to compliance with requirements, provide "K-13 Spray-On-Systems" by International Cellulose Corporation, (713) 433-6701 or (800) 444-1252 www.spray-on.com., or comparable product by one of the following:
   1. For approved applicators contact ICC at (800) 444-1252.

2.02 MATERIALS

A. K-13 Spray-On-Systems:
   1. Color:
      a. Black.
      b. White in all other areas
   2. Comply with local Building Code requirements.
   3. Material to have been tested in accordance with ASTM E1042. Testing laboratory must be NVLAP accredited.
B. Mixture:
   1. Standard.

2.03 ACCESSORIES

A. Primer: As required by insulation manufacturer.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that surfaces are clean, dry, and free of matter that may inhibit adhesion.
B. Verify that ceiling hangers and supporting clips have been are installed correctly.
C. Verify other work on and within spaces to be insulated is complete prior to application.
D. Clips, hangers, supports, sleeves and other attachments to spray bases are to be placed by other trades prior to the application of sprayed insulation.
E. Ducts, piping, conduit or other suspended equipment shall not be positioned until after the application of sprayed insulation.
F. Roof penetrations to be installed prior to application.

3.02 PREPARATION

A. Mask and protect adjacent surfaces from overspray or damage.
B. Apply primer in accordance with manufacturer's instructions.

3.03 INSTALLATION

A. Install insulation in accordance with manufacturer's instructions.
B. Install insulation to a uniform monolithic density without voids.
C. Install to a minimum cured thickness of 1 inch. to achieve an average NRC of .75
D. Cure insulation with continuous natural or mechanical ventilation.
E. Remove and dispose of over-spray.

3.04 PROTECTION

A. Do not permit subsequent construction work to disturb applied insulation.

END OF SECTION 07 2129

This page intentionally left blank

SECTION 07 2500

MEMBRANE WEATHER BARRIERS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Furnish all labor, materials, equipment, tools and services required to fully complete all Weather Barriers work as in indicated on the drawings and/or specified herein including, but not limited to, the following described items.
B. Coursing and through-wall flashing membranes, at metal stud wall conditions.
C. Air Infiltration Barrier Systems.
    1. Air Barrier Sheet, Self-Adhered.
    2. Expansion joint flashing.
        a. At Steel stud / glass-mat faced sheathing conditions.
        b. At Masonry wall to wood parapet blocking transition as detail in drawings.
D. Accessories.
E. Do not include sales tax, refer to Section 00 1115 - Advertisement for Prequalification of Bidders.

1.02 RELATED REQUIREMENTS

A. Section 04 2001 - Masonry Veneer: Coursing and through-wall flashing membranes at masonry cavity walls
B. Section 04 2731 - Reinforced Unit Masonry.
C. Section 05 4000 - Cold-Formed Metal Framing: Water-resistive barrier under exterior cladding.
D. Section 07 2100 - Building Insulation: Vapor retarder installed in conjunction with batt insulation.
E. Section 07 4213 - Metal Wall and Soffit Panels: Water-resistive barrier under panels.
F. Section 07 6200 - Sheet Metal Flashing and Trim: Metal flashings installed in conjunction with weather barriers.
G. Section 07 9200 - Joint Sealants: Sealing building expansion joints.
H. Section 09 2116 - Gypsum Board Assemblies: Water-resistive barrier under exterior cladding.

1.03 DEFINITIONS

A. Air Barrier: Air tight barrier made of material that is relatively air impermeable but water vapor permeable, both to the degree specified, with sealed seams and with sealed joints to adjacent surfaces. Note: For the purposes of this specification, vapor impermeable air barriers are classified as vapor retarders.
B. Vapor Retarder: Air tight barrier made of material that is relatively water vapor impermeable, to the degree specified, with sealed seams and with sealed joints to adjacent surfaces.
    1. Water Vapor Permeance: For purposes of conversion, 57.2 ng/(Pa s sq m) = 1 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

A. AATCC Test Method 127 - Water Resistance: Hydrostatic Pressure Test; 2018.
B. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2021a.
C. ASTM E96/E96M - Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials; 2021.

D. ASTM E2178 - Standard Test Method for Determining Air Leakage Rate and Calculation of Air Permeance of Building Materials; 2021a.
E. ICC-ES AC148 - Acceptance Criteria for Flexible Flashing Materials; 2017.

1.05 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene one week before starting work of this section.
   1. See Section 01 3000 - Administrative Requirements, for meeting procedures.
   2. Verify that flashing membranes are compatible with air infiltration barrier.

1.06 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide data on material characteristics, performance criteria, and limitations.
C. Shop Drawings: Provide drawings of special joint conditions.
D. Manufacturer's Installation Instructions: Indicate preparation, installation methods, and storage and handling criteria.
E. Warranty: Submit manufacturer warranty and ensure that forms have been completed in School District's name and registered with manufacturer.

1.07 QUALITY ASSURANCE

A. Air Barrier Association of America (ABAA) Quality Assurance Program (QAP); www.airbarrier.org
   1. Installer Qualification: Use accredited contractor, certified installers, evaluated materials, and third-party field quality control audit.
   2. Manufacturer Qualification: Use evaluated materials from a single manufacturer regularly engaged in air barrier material manufacture, and use secondary materials approved in writing by primary material manufacturer.
B. Testing Agency Qualifications: Independent firm specializing in performing testing and inspections of the type specified in this section.
C. Single Source: Water-resistive vapor permeable air barrier membrane components and accessories must be obtained as a single-source membrane system to ensure total system compatibility and integrity.
D. Manufacturer Qualifications
   1. Manufacturer of specified products listed in this Section to have minimum 8 years of continued experience in the manufacture and supply of highly vapor permeable water resistive air barrier products successfully installed in similar project applications.
   2. Manufacturer of specified products listed in this Section to have experienced in-house technical and field observation personal qualified to provide expert technical support.

1.08 MOCK-UP

A. Construct typical exterior wall panel, 6 foot long by 6 foot wide incorporating the sheathing board or substrate, sill pan protection system, window frame and attachment method, clips, strapping or masonry ties, attachment of insulation and detailing of water-resistive vapor permeable air barrier membrane application and lap seams.
B. Allow 48 hours for inspection of mock-up by Architect before proceeding with water-resistive vapor permeable air barrier work. Mock-up may remain as part of the Work.

1.09 DELIVERY, STORAGE AND HANDLING

A. Refer to current Product MSDS for proper storage and handling.
B. Deliver materials to the job site in undamaged and original packaging indicating the name of the manufacturer and product.

C. Store roll materials on end in original packaging. Protect rolls from direct sunlight and inclement weather until ready for use.

1.10 FIELD CONDITIONS

1.11 WARRANTY

A. The Contractor shall guarantee his work for a period of One (1) year from date of Substantial Completion. Guarantee shall be on form included in Section 01 7800.

B. Provide manufacturer's standard material warranty in which manufacturer agrees to provide replacement material for the self-adhered water-resistive vapor permeable air barrier sheets installed in accordance with manufacturer's instructions that fails due to material defects within 20 years of the date of Substantial Completion.

PART 2 PRODUCTS

2.01 AIR INFILTRATION BARRIER (WATER VAPOR PERMEABLE AND WATER-RESISTIVE)

A. Air Barrier Sheet, Self-Adhered:
   1. Air Permeance: 0.0000263 cubic feet per square foot (0.000134 liters per second per square meter), maximum, when tested in accordance with ASTM E2178.
   2. Water Vapor Permeance: 50 perms (2875 ng/(Pa s sq m)), minimum, when tested in accordance with ASTM E96/E96M Procedure B.
   3. Water Penetration Resistance: Withstand a water head of 21 inches (55 cm), minimum, for minimum of 5 hours, when tested in accordance with AATCC 127.
   4. Ultraviolet and Weathering Resistance: Approved in writing by manufacturer for minimum of 6 months weather exposure.
   5. Surface Burning Characteristics: Flame spread index of 10 or less, smoke developed index of 15 or less, when tested in accordance with ASTM E84.
   6. Water Resistance: Comply with applicable water-resistive requirements of ICC-ES Acceptance Criteria AC38.
   7. Acceptable Products:
      a. Henry Company; BlueskinVP 160: www.henry.com.
      b. Dorken Systems Inc.; Delta-Vent SA; www.dorken.com.
      c. Substitutions: See Section 01 6000 - Product Requirements.

2.02 SEALANTS

A. As recommended by Air Barrier manufacturer.

2.03 EXPANSION JOINT FLASHING

A. Flashing: SBS modified bitumen, self-adhering sheet membrane complete with a cross-laminated polyethylene film. Membrane shall have the following physical properties:
   1. Air leakage: <0.0001 CFM/ft² @1.6 lbs/ft2 to ASTM E 2178 and ASTM E 283 and have no increased air leakage when subjected to a sustained wind load of 10.5 lbs/ft2 for 1 hour and gust wind load pressure of 62.8 lbs/ft2 for 10 seconds when tested at 1.6 lbs/ft2 to ASTM E331.
   2. Vapor permeance: 0.05 perms to ASTM E96.
   3. Membrane Thickness: 0.0394 inch (40 mils).
   4. Low temperature flexibility: -22 degrees F to CGSB 37-GP-56M.
   5. Elongation: 200% to ASTM D412-modified.
   6. Meets CAN/CGSB-51-33 Type I Water Vapor Permeance requirements.
   7. Acceptable Products:
      a. Henry Company; Blueskin SA: www.henry.com.

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

2.04 ACCESSORIES

A. Flexible Transition and Flashing Membrane: Self-adhesive sheet flashing recommended by air barrier manufacturer for a complete system.
B. Preformed Window and Door Flashing Membranes: As recommended by air barrier manufacturer for a complete system.
C. Flashing and Penetration Tapes: As recommended by air barrier manufacturer for a complete system.
D. Primers, Cleaners, and Sealant Materials: As recommended by air barrier manufacturer, appropriate to application, and compatible with adjacent materials.
E. Adhesives: As recommended by air barrier manufacturer.
F. Fasteners: As recommended by air barrier manufacturer for substrate type.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that surfaces and conditions are ready to accept the Work of this section. Notify Architect in writing of any discrepancies. Commencement of the Work or any parts thereof shall mean acceptance of the prepared substrates.
B. All surfaces must be dry, sound, clean and free of oil, grease, dirt, excess mortar or other contaminants detrimental to the adhesion of the water resistive air barrier membrane and flashings. Fill voids and gaps in substrate greater than 1/4 inch in width to provide an even surface. Strike masonry joints full-flush.

3.02 PREPARATION

A. Ensure all preparatory Work is complete prior to applying primary self-adhered vapor permeable air barrier sheet membrane.
B. Remove projections, protruding fasteners, and loose or foreign matter that might interfere with proper installation.
C. Mechanical fasteners used to secure sheathing boards or penetrate sheathing boards shall be set flush with sheathing and fastened into solid backing.
D. Clean and prime substrate surfaces to receive adhesives and sealants in accordance with manufacturer's instructions.

3.03 INSTALLATION

A. Install materials in accordance with manufacturer's instructions.
B. Apply sealants and adhesives within recommended application temperature ranges. Consult manufacturer if temperature is out of this range.

3.04 INSTALLATION OF SELF-ADHERED MEMBRANE SHEETS

A. Install materials in accordance with manufacturer's instructions for a complete system.
B. Coordination:
    1. Self-adhered vapor permeable air barrier sheets may be installed vertically or horizontally over the outside face of exterior sheathing board or substrate.
    2. Complete detail Work around corners, wall openings, building transitions and penetrations prior to field applications.
    3. Install self-adhered vapor permeable air barrier sheet over the outside face of exterior sheathing board or substrate, measure and pre-cut into manageable sized sheets to suit the application conditions.

4. Install self-adhered vapor permeable air barrier sheet complete and continuous to substrate in a sequential overlapping weatherboard method starting at bottom or base of wall and working up.
5. Stagger all end lap seams.
6. Roll installed membrane with roller to ensure positive contact and adhesion with substrate.

C. Inside and Outside Corners:
1. Pre-treat inside and outside corners with self-adhered air barrier transition and flashing membrane extending a minimum of 5 inches from inside and outside corners, or overlap field material a minimum of 3 inches in each direction.
2. Align and position self-adhered air barrier transition and flashing membrane, remove protective film and press firmly into place. Provide minimum 3 inch overlap at all side laps and minimum 3 inch overlap at all end laps of membrane.
3. Roll membrane and lap seams with roller to ensure positive contact and adhesion.

D. Building Transition Conditions:
1. Tie-in to structural beams, columns, floor slabs and intermittent floors, parapet curbs, foundation walls, roofing systems and at the interface of dissimilar materials with self-adhering air barrier transition and flashing membrane.
2. Align and position self-adhered air barrier transition and flashing membrane, remove protective film and press firmly into place. Provide minimum 3 inch lap on to substrates.
3. Ensure minimum 3 inch overlap at side and end laps of membrane.
4. Roll membrane and lap seams with roller to ensure positive contact and adhesion.

E. Window, Door and Other Wall Openings:
1. To avoid waste, predetermine best method and sequence to the install self-adhered air barrier transition and flashing membrane around window or wall openings subject to the opening size and installation of window, door or louver type.
2. Wrap self-adhered air barrier transition and flashing membrane into wall openings to cover sill, jambs and head. It is not required to install continuous sheets through corners.
3. Remove release film, align flashing membrane and apply pressure to ensure positive contact. Roll Lap seams to ensure adhesion. Provide lap seams to shed water.
4. Install preformed corner flashing membrane into corners over flashing membrane. Secure preformed corners into position with flashing tape and seal to self-adhered air barrier.
5. Subject to window installation requirements, install preformed sill pan system and seal to installed self-adhered air barrier window flashing membrane with sealant.
6. Install windows in accordance with window manufacturer’s details and cover nail flange with flashing tape. Install flashing tape along jamb and across head flanges of window and seal to installed self-adhered air barrier transition membrane. Roll tape to ensure positive contact to substrate. Seal exposed leading edge of tape.
7. For windows without nail flange, install specified aluminized tape around perimeter of opening to accommodate placement of backer rod and sealant between window frame and self-adhered vapor permeable air barrier membrane.

F. Mechanical Equipment Penetrations:
1. Mechanical pipe, electrical conduit and/or duct work must be secured solid into position prior to installation of self-adhered vapor permeable air barrier membrane.
2. Electrical services penetrating the wall assembly and self-adhered vapor permeable air barrier membrane must be placed in appropriate conduit and secured solid into position.
3. Install manufactured flanged penetration sleeves as recommended by sleeve manufacturer.
4. For straight sided penetrations, cut and fit self-adhered vapor permeable air barrier to accommodate sleeve, install specified single sided flashing tape to seal the air barrier membrane to ductwork or preformed flange sleeve.
5. For pipe penetrations, refer to manufacturer’s standard details.

G. Vertical Applications:
   1. For vertical applications, align sheets with an ‘inside’ or ‘outside’ corner to avoid wrinkles and miss-alignment of subsequent applications.
   2. Measure and pre-cut into manageable sized self-adhered sheets to suit the application conditions.
   3. Hang self-adhered sheets over wall and extend down to lowest point of wall. Allow for excess material at bottom of wall to accommodate tie-ins and connections to adjacent surfaces.
   4. Align and position self-adhered membrane, remove release film and press firmly into place. Provide minimum 3 inch overlap at side and end laps of membrane. Roll membrane and lap seams with roller to ensure contact and adhesion.
   5. Continue to remove release film and apply pressure to ensure positive contact onto wall substrate.
   6. Install subsequent sheets of self-adhered vapor permeable air barrier sheets in overlapping weatherboard format. Ensure sheets lay smooth and flat to surfaces. Roll membrane and lap seams with roller to ensure contact and adhesion.

H. Horizontal Applications:
   1. For horizontal applications, align sheets and begin installation of water-resistive weather barrier at bottom or lowest point of wall.
   2. To avoid wrinkles and miss-alignment of subsequent applications it is recommended to pre-mark or "Snap" a level line to work from. Measure and pre-cut into manageable sized sheets to suit the application conditions.
   3. Allow for excess material at bottom of wall to accommodate tie-ins and connections to adjacent surfaces.
   4. Align and position self-adhered membrane, remove release film and press firmly into place. Provide minimum 3 inch overlap at all side and end laps of membrane. Roll membrane and lap seams with roller to ensure contact and adhesion.
   5. Continue to remove release film and apply pressure to ensure positive contact onto wall substrate.
   6. Install subsequent sheets of self-adhered vapor permeable air barrier sheets in overlapping weatherboard format. Ensure sheets lay smooth and flat to surfaces. Roll membrane and lap seams with roller to ensure contact and adhesion.

I. Fastening Clips and Masonry Ties:
   1. Install clips and masonry ties over primary self-adhered vapor permeable air barrier membrane.
   2. Secure clips and masonry ties with corrosion-resistant, or stainless steel screws with gasketed fasteners.
   3. Consult manufacturer for recommendations on appropriate methods to seal penetrations.

3.05 FIELD QUALITY CONTROL

A. See Section 01 4000 - Quality Requirements, for additional requirements.
B. Do not cover installed weather barriers until required inspections have been completed.
C. Obtain approval of installation procedures by the weather barrier manufacturer based on a mock-up installed in place, prior to proceeding with remainder of installation.
D. Take digital photographs of each portion of the installation prior to covering up.
E. An independent consultant will observe substrate and membrane installation prior to placement of cladding systems and provide written documentation of observations, as specified in Section 01 4000.

3.06 PROTECTION

A. Protect wall areas covered with self-adhered water-resistive vapor permeable air barrier from damage due to construction activities, high wind conditions, and extended exposure to inclement weather.

B. Review condition of water-resistive vapor permeable air barrier prior to installation of cladding. Repair, or remove and replace damaged sections with new membrane.

1. Recommend to cap and protect exposed back-up walls against wet weather conditions during and after application of membrane, including wall openings and construction activity above completed self-adhered water-resistive vapor permeable air barrier installations.
2. Remove and replace water-resistive weather barrier membrane affected by chemical spills or surfactants.

END OF SECTION 07 2500

This page intentionally left blank

SECTION 07 2600

UNDER-SLAB VAPOR BARRIER

PART 1 – GENERAL

1.01 SECTION INCLUDES

A. Furnish all labor, materials, equipment, tools and services required to fully complete all Under-Slab Vapor Barrier work as is indicated on the drawings and/or specified herein including, but not limited to, the following described items:
   1. Vapor barrier.
   2. Vapor barrier accessories.

1.02 RELATED REQUIREMENTS

A. Related Sections:
   1. Section 03 3000 - Cast-in-Place Concrete.

1.03 REFERENCE STANDARDS

A. ASTM International:
   1. ASTM E1745-17 Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill Under Concrete Slabs.
   2. ASTM E1643-18a Selection, Design, Installation, and Inspection of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs.

B. Technical Reference - American Concrete Institute (ACI):
   1. ACI 302.2R-06 Guide for Concrete Slabs that Receive Moisture-Sensitive Flooring Materials.
   2. ACI 302.1R-15 Guide to Concrete Floor and Slab Construction.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene a preinstallation meeting one week before starting work of this section.

1.05 SUBMITTALS

A. Quality control/assurance:
   1. Summary of test results per paragraph 9.3 of ASTM E1745.
   2. Manufacturer’s samples and literature.
   3. Manufacturer’s installation instructions and details for placement, seaming, penetration prevention and repair, and perimeter seal per ASTM E1643.
   4. All mandatory ASTM E1745 testing must be performed on a single production roll per ASTM E1745 Section 8.1.

PART 2 – PRODUCTS

2.01 MATERIALS

A. Vapor barrier shall have all of the following qualities:
   1. Maintain permeance of less than 0.01 Perms [grains/(ft2 · hr · inHg)] as tested in accordance with mandatory conditioning tests per ASTM E1745 Section 7.1 (7.1.1-7.1.5).
   2. Other performance criteria:
      a. Strength: ASTM E1745 Class A.
      b. Thickness: 15 mils minimum.

3. Provide third party documentation that all testing was performed on a single production roll per ASTM E1745 Section 8.1

2.02 VAPOR BARRIER PRODUCTS:

A. Basis of Design: Stego Wrap Vapor Barrier (15-mil) by Stego Industries LLC., (877) 464-7834 www.stegoindustries.com.
B. Other manufacturers: Products subject to compliance with specification.
   1. VIPER VAPORCHECK II 15-MIL by ISI Building Products, P: 866-698-6562, www.viper2.com.
   2. PERMINATOR 15-MIL by W.R. Meadows, Inc., P: 847-214-2100, www.wrmeadows.com.
   3. Substitutions: Refer to Section 01 6000 - Product Requirements.

2.03 ACCESSORIES

A. Seams Tape:
   a. Minimum 4 inch (102 mm) width.
   b. Permeance less than 0.1 perms per ASTM F 1249 or ASTM E 96.
B. Mastic:
   1. Permeance less than 0.1 perms per ASTM F 1249 or ASTM E 96.
C. Pipe boot: 1. Permeance less than 0.1 perms per ASTM F 1249 or ASTM E 96.

PART 3 – EXECUTION

3.01 PREPARATION

A. Ensure that gravel base is approved by Architect prior to installation.

3.02 INSTALLATION

A. Install vapor barrier in accordance ASTM E1643.
   1. Unroll vapor barrier with the longest dimension parallel with the direction of the concrete placement and face laps away from the expected direction of the placement whenever possible.
   2. Extend vapor barrier to the perimeter of the slab. If practicable, terminate it at the top of the slab, otherwise (a) at a point acceptable to the structural engineer or (b) where obstructed by impediments, such as dowels, waterstops, or any other site condition requiring early termination of the vapor barrier. At the point of termination, seal vapor barrier to the foundation wall, grade beam or slab itself.
      a. Seal vapor barrier to the entire perimeter wall or footing/grade beam with double sided tack tape, or both termination bar and tack tape, per manufacturer's instructions. Ensure the concrete is clean and dry prior to adhering tape.
      b. Overlap joints 6 inches and seal with manufacturer's seam tape.
B. Apply seam tape to a clean and dry vapor barrier.
C. Seal all penetrations (including but not limited to pipes, conduits, rebar, rips, tears, etc.) per manufacturer's instructions.
D. For interior forming applications, avoid the use of non-permanent stakes driven through vapor barrier. If non-permanent stakes must be driven through vapor retarder, repair as recommended by vapor retarder manufacturer.
E. Use reinforcing bar supports with base sections that eliminate or minimize the potential for puncture of the vapor barrier.
F. Repair damaged areas with vapor barrier material.

END OF SECTION 07 2600

SECTION 07 4113

METAL ROOF AND SOFFIT PANELS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Furnish all labor, materials, equipment, tools and services to fully complete all Metal Roof Panel work as is indicated on the drawings or specified herein including, but not limited to, the following described items.
B. Architectural roofing system of preformed steel panels.
C. Soffit panel system of preformed steel panels.
D. Accessories.
E. Locations:
   1. Softball dugouts.
   2. Softball pressbox.
F. Do not include sales tax, refer to Section 00 1115 - Advertisement for Prequalification of Bidders

1.02 RELATED REQUIREMENTS

A. Section 06 1000 - Rough Carpentry: Roof sheathing.
B. Section 07 2100 - Building Insulation: Rigid roof insulation.
C. Section 07 4213 - Concealed Fastener Metal Wall Panels: Preformed wall panels.
D. Section 07 9200 - Joint Sealants: Sealing joints between metal roof panel system and adjacent construction.
E. Section 07 4264 - Metal Composite Wall and Soffit Panels.

1.03 REFERENCE STANDARDS

A. IAS AC472 - Accreditation Criteria for Inspection Programs for Manufacturers of Metal Building Systems; 2018.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Preliminary Roofing Conference: Before starting roof deck construction, conduct conference at Project site. Review methods and procedures related to roof deck construction and roofing system including, but not limited to, the following:
   1. Meet with Owner, Architect, testing and inspecting agency representative, roofing Installer, roofing system manufacturer's representative, deck Installer, 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 substrate conditions and finishes for compliance with requirements, including flatness and fastening.
   5. Review structural loading limitations of roof deck during and after roofing.
   6. Require that all complimentary trades be present at conference. Including, but not limited to; electrical, plumbing, HVAC, and framing contractors.
   7. Review base flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that will affect roofing system.

8. Review governing regulations and requirements for insurance and certificates if applicable.
9. Review temporary protection requirements for roofing system during and after installation.
10. Review roof observation and repair procedures after roofing installation.

1.05 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. Summary of test results, indicating compliance with specified requirements.
   2. Storage and handling requirements and recommendations.
   3. Installation methods.
   4. Specimen warranty.
C. Shop Drawings: Include layouts of roof panels soffit panels and fascia 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 system specified, submit color chips representing manufacturer's full range of available colors and patterns.
E. Verification Samples: For each system specified, submit samples of minimum size 12 inches square, representing actual panel metal, thickness, profile, color, and texture.
   1. Include typical panel joint in sample.
   2. Include typical fastening detail.
F. Test Reports: Indicate compliance of metal roofing system to specified requirements.
G. Installer Certification: Submit a letter from the manufacturer certifying the installer of the metal panel system as an authorized installer, approved by the manufacturer within the last year prior to the start of the installation of the metal panel system.
H. Roof Inspection for Weathertightness Warranty: Submit with documentation as specified in this Section.
I. Warranty: Submit specified manufacturer's warranty and ensure that forms have been completed in Owner's name and are registered with manufacturer.

1.06 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years of documented experience.
   1. Accredited by IAS in accordance with IAS AC472.
B. Installer Qualifications: Installer shall have completed five projects of similar scope and magnitude that have been in service for a minimum of two years with satisfactory performance of the roof system. Installer's foreman shall be trained in the proper installation of the specified system, and present at all times when material is being installed.
C. Regulatory Requirements: Comply with specified performance and local building code requirements. In the event of conflict, comply with the higher performing or more restrictive requirement.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Store roofing panels on project site as recommended by manufacturer to minimize damage to panels prior to installation.
B. Deliver materials to job site properly packaged to provide protection against transportation damage.
C. Exercise extreme care in unloading, storing and installing metal panel system to prevent bending, warping, twisting and surface damage.

D. Store all material and accessories above ground on well supported platforms. Store under waterproof covering. Provide proper ventilation of metal panel system to prevent condensation build-up between each panel or trim/flashing component.
E. Store products in manufacturer's unopened packaging until ready for installation.

1.08 PROJECT CONDITIONS

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

1.09 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 and soffit 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 35 year period 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.
D. The Contractor shall guarantee this work for a period of One (1) year from date of Substantial Completion. Guarantee shall be on form included in Section 01 7800.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Basis of Design Manufacturer:
   1. Metal Sales Manufacturing Corporation: www.metalsales.us.com.
      a. Roof System: Magna-Loc.
      b. Soffit System: Soffit Panel: TLC-1.
B. Metal Roof Panels:
   1. ATAS International, Inc: www.atas.com.
   2. Berridge Manufacturing Company: www.berridge.com.
   3. Firestone Building Products LLC: www.firestonebpco.com.
   4. Petersen Aluminum Corporation; Snap-Clad Panel: www.pac-clad.com.
   5. Firestone Building Products: www.firestonebpco.com.
C. Substitutions: See Section 01 6000 - Product Requirements.

2.02 ROOF PANELS

A. Product Options:
   1. Panel Coverage: 18
   2. Rib Height: 2 inch.
   3. Material: Aluminum-zinc alloy-coated steel sheet, ASTM A 792, AZ50 coating designation, structural quality, Grade 50, 0.0236-inch (0.60-mm) minimum thickness.
   4. Minimum Roof Slope Capability: 1/2:12.
   5. Sealant: Factory-applied side lap sealant.
   6. Side Lap: Mechanically seamed.
   7. Attachment: Concealed clip designed for thermal movement.
   8. Insulation Capacity: Accommodate rigid insulation 5 inches.
   9. Application: Applied over metal deck.
   10. Fire Resistance Rating: Comply with UL 263 and UL 790 Class A Fire Resistance Ratings.
   11. Impact Resistance: Comply with UL 2218, Class 4.

12. Air Infiltration: Tested according to ASTM E 1680.
13. Water Infiltration: No leakage when tested according to ASTM E 1646 and ASTM E 2140.
14. Wind Uplift Resistance: Tested according to ASTM E 1592 and in compliance with UL 580, Class 90 Wind Uplift, Construction #506, 506A and 506B.

2.03 SOFFIT PANELS

A. Soffit Panels: Factory-formed panels with factory-applied finish.
   1. Steel Panels:
      a. Aluminum-zinc alloy-coated steel conforming to ASTM A792/A792M; minimum AZ50 (AZM150) coating.
      b. Steel Thickness: Minimum 22 gage, 0.030 inch (0.759 mm).
   2. Profile: 12 inch (305 mm) width with a 1 inch (25 mm) rib height with "V-Grooves."
   3. Perforations: None.
   4. Seam Type: Interlock.
   5. Fastening System: Concealed, direct fastened.

2.04 FINISHES

A. Fluoropolymer Coating System: Manufacturer’s standard multi-coat thermocured coating system, including minimum 70 percent fluoropolymer color topcoat with minimum total dry film thickness of 0.9 mil; gloss as selected from manufacturer’s standards.
   1. Color: Custom color as selected by Architect.

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 Closures: Provide premolded, close-fitting components of solid-cell or closed-cell synthetic rubber, neoprene, or PVC to match configuration of the covering and shall not absorb or retain water. Thermal spacer blocks and other thermal barriers at concealed clip fasteners as recommended by manufacturer.
C. Round Penetrations: Premolded EPDM boot with metal collar.
   1. Products:
      a. Dektite manufactured by Buildex.
      b. Substitutions: See Section 01 6000 - Product Requirements.
D. Sealants: Elastomeric type containing no oil or asphalt as recommended by manufacturer.
   1. Exposed Sealant: Elastomeric; silicone, polyurethane, or silyl-terminated polyether/polyurethane.
   2. Concealed Sealant: Non-curing butyl sealant or tape sealant.
E. Polyisocyanurate Board Insulation: ASTM C1289, Type II, Class 1, fiber reinforced felt both faces; Grade 2 and with the following characteristics:
   1. Compressive Strength: 20 psi.
   2. Board Size: 48 inch by 96 inch (1220 mm by 2440 mm).
   3. Thermal Resistance: Aged value shall be based upon 15-year time weighted average LTTR (long-term thermal resistance).
      a. R-Value: R-30.
   4. Board Edges: Square.
F. Snow Guards:
   1. Products:

a. Systems: ColorGard, DualGard, SnoFence or SnoRail.
b. Clamps: S-5-U clamp.

2. Manufacturer: S-5! Metal Roof Innovations, Ltd., 8655 Table Butte Road, Colorado Springs, CO, 80908.
3. System must be properly designed to resist required snow loads.

2.06 FABRICATION

A. Panels: Fabricate and finish panels and accessory items at factory, using manufacturers standard processes as required to achieve specified appearance and performance requirements.
B. All steel to be correctively leveled and handled to minimize stress and waviness of sheet steel.
C. Form and fabricate sheets, seams, strips, clips, valleys, ridges, edge treatments, integral flashings, and other components of the metal roof to the profiles, patterns, and drainage arrangements as determined by Architect, to provide permanent leakproof construction, with no oil canning or panel distortion.
   1. Fabricate exposed items of prefinished sheet metal, color to match panels.
   2. Hem exposed edges on underside 3/8 inch (10mm) to 1/2 inch (12 mm) miter and seam corners.
   3. Provide for thermal expansion and contraction of the Work.
   4. Seal joints to achieve leakproof construction per manufacturer's detail.
D. Provide factory eave notch for eave termination (to be utilized with joggle cleat detail).
E. Fabricate vertical faces with bottom edge formed outward 1/4 inch (6 mm) and hemmed to form drip.
F. Unless otherwise shown on drawings or specified herein, panels shall be full length. Fabricate flashings and accessories in longest practical lengths.
G. Metal panels shall be factory formed. Field formed panels are not acceptable.

PART 3 EXECUTION

3.01 EXAMINATION

A. Do not begin installation of preformed metal panels until substrates have been properly prepared.
B. The Contractor shall verify installed work of other trades that such work is complete to a point where the metal panel system installation may commence.
C. Verify that the substructure installation is in accordance with the approved shop drawings and metal panel system manufacturer's requirements.
D. This specifically includes verifying that secondary structural members and/or decking are installed to meet performance requirements. Coordinate with metal panel system manufacturer to ensure that the substructure is installed to accommodate the appropriate clip spacing.
E. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.02 INSTALLATION

A. Overall: Install roofing and soffit 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. Minimize field cutting of panels. Where field cutting is absolutely required, use methods that will not distort panel profiles. Use of torches for field cutting is absolutely prohibited.

B. Accessories: Install all components required for a complete roofing assembly, including flashings, gutters, downspouts, trim, moldings, closure strips, preformed crickets, caps, equipment curbs, rib closures, ridge closures, and similar roof accessory items.
C. Install ice and water shield in accordance with manufacturer's instructions.
D. Roof Panels: Install panels in strict accordance with manufacturer’s instructions, minimizing transverse joints except at junction with penetrations.
E. Avoid placing pipe penetrations through the panel seams.

3.03 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.

3.04 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 07 4113

SECTION 07 4213

CONCEALED FASTENER METAL WALL PANELS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Furnish all labor, materials, equipment, tools and services to fully complete all Metal Wall Panel work as is indicated on the drawings or specified herein including, but not limited to, the following described items.
B. Manufactured metal panel systems for walls and soffits, with related flashings and accessory components.
C. Attachment/support framing system.
D. Do not include sales tax, refer to 00 1115 - Advertisement for Prequalification of Bidders.

1.02 RELATED REQUIREMENTS

A. Section 07 2119 - Foamed-In-Place Insulation.
B. Section 07 2500 - Membrane Weather Barriers: Weather barrier under wall panels.
C. Section 07 9200 - Joint Sealants: Sealing joints between metal wall panel system and adjacent construction.
D. Section 07 6200 - Sheet Metal Flashing and Trim: Parapet caps, copings, flashings, and reglets.
E. Section 08 4313 - Aluminum-Framed Storefront: Storefront assemblies integral with wall panel system.
F. Section 09 2117 - Gypsum Board Assemblies: Wall panel substrate.
G. Section 09 2116 - Gypsum Board Assemblies: Water-resistive barrier under wall panels.

1.03 REFERENCE STANDARDS

A. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2020.
B. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2014.
C. ASTM B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate (Metric); 2014.
D. SMACNA (ASMM) - Architectural Sheet Metal Manual; 2012.

1.04 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.
    1. Coordinate building framing in relation to metal wall panel assembly.
    2. Coordinate installation of weather barrier, insulation, and sheathing behind metal wall panel assembly.
    3. Coordinate window, door and louver, and other openings and penetrations of metal wall panel assembly.

1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Product Data: Include data indicating compliance with performance requirements.

C. Shop Drawings: Provide shop drawings prepared by manufacturer or manufacturer's authorized Installer. Include full elevations showing openings and penetrations. Include details of each condition of installation and attachment. Provide details at a minimum scale of 1 1/2 inch per foot (1:8) of all required trim and extrusions needed for a complete installation.
   1. Indicate points of supporting structure that must coordinate with metal wall panel assembly installation.
   2. Indicate details of fastening, including clip spacing, supported by load span tables that include an evaluation of clip and panel side joint interaction.
D. Samples: Submit two samples of each wall panel and trim pieces, 12 inches (300 mm) in length illustrating finish color, sheen, and texture.
E. Manufacturer's Qualification Statement.
F. Warranty: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

1.06 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years of documented experience.
B. All metal panels shall be provided by single manufacturer.

1.07 MOCK-UP

A. Construct mock-up, 8 feet long by 8 feet wide; include panel system, attachments to building frame, weep drainage system, sealants and seals in mock-up.
B. Locate where directed by Architect.
C. Mock-up may remain as part of the Work.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Protect panels from accelerated weathering by removing or venting sheet plastic shipping wrap.
B. Store prefinished material off the ground and protected from weather; prevent twisting, bending, or abrasion; provide ventilation; slope metal sheets to ensure proper drainage.
C. Prevent contact with materials that may cause discoloration or staining of products.

1.09 WARRANTY

A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
B. Manufacturer’s Warranty: On manufacturer’s standard form, in which manufacturer agrees to repair or replace metal wall panel assemblies that fail in materials and workmanship within 5 years from date of Substantial Completion.
C. Panel Finish Warranty: On manufacturer’s standard form, in which manufacturer agrees to repair or replace wall panels that evidence deterioration of finish within 20 years from date of Substantial Completion.
D. The Contractor shall guarantee his work for a period of One (1) year from date of Substantial Completion. Guarantee shall be on form included in Section 01 7800.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Basis of Design Manufacturer:
   1. Morin (A Kingspan Group Company): morincorp.com.
   2. Substitutions: See section 01 6000 - Product Requirements.
B. Type 1 - Concealed fastener metal panel system.
   1. Panel Types: Matrix Series - refer to Drawings for profile types.
   2. Refer to drawings for panel layout.

C. Type 2 - Concealed fastener metal panel system.
   1. Panel Types: Matrix Series - MX-6 profile.

2.02 CONCEALED FASTENER METAL WALL PANELS

A. General: Factory-formed, concealed fastener panels with interconnecting side joints, fastened to supports with concealed fasteners, with factory-applied sealant in side laps when required to meet performance requirements.
B. Metallic-Coated Steel Face Sheet: Coil-coated, ASTM A 755/A 755M.
   1. Aluminum-zinc alloy-coated Steel Sheet: ASTM A 792/A 792 M, Class AZ50 Grade 50 (Class AZM150, Grade 275), structural steel quality.
   2. Face Sheet: 20 gauge nominal uncoated thickness.
   3. Surface: Smooth.
C. Flush-Joint Profile Panel:
   1. Panel Coverage: 12 inches.
   2. Panel Height: 1 1/2 inches.
D. Exposed Coil-Coated Finish System:
   1. Fluropon PVDF - Kynar500.
      a. 0.2 mil primer with a 0.8 mil color (70 percent PVDF).
      b. Color: As selected by architect from manufacturer's full line.

2.03 ATTACHMENT/SUPPORT FRAMING SYSTEM

A. Comply with ANSI/ASHRAE 90.1-2010 definition of continuous insulation (c.i.).
B. Coating Material: ASTM A1046, Zinc-Aluminum-Magnesium, minimum thickness ZM40.
   1. ASTM A653 Galvanized steel is not acceptable.
C. Steel Classification: Structural Steel (SS), Grade 50, 50 ksi yield.
D. Spacing: Comply with Manufacturer's professional engineer's calculations.
E. Horizontal Rail: Nominal 0.046 inch thick (18 gauge) cold-formed steel.
   1. Profile: Hat channel with stiffening lips.
   2. Profile Depth: 0.75 inches.
   3. Girt Fastening Face: 2.0 inches.
   4. Weep Drains: 0.75 inches diameter at 4 inches on center along flanges to allow for free air flow laterally.
   5. Attachment Holes: Located at 2 inch on center along back to facilitate number 14 self-drilling self-tapping screw attachment to primary rail.
      a. Oversize holes to allow for thermal contraction and expansion of rail.
   6. Basis of Design: PanelRail by Knight Wall Systems.
   7. Substitutions: See Section 01 6000 - Product Requirements.
F. Fasteners:
   1. Sufficient length to provide solid attachment through rigid insulation to structure as required by manufacturer.
   2. Thermal Isolating Washers: Minimum 0.125 inch thick Polyoxymethylene copolymer (POM) washers with integral centering lip to act as a thermal break between wall anchor fasteners and girt.
      a. Tensile Yield Strength: 9.57 ksi per ISO 527.
      b. Melting Temperature: 329 degrees Fahrenheit per ISO 3146.
      c. Basis of Design: ThermaStop Isolator by Knight Wall Systems.
      d. Substitutions: See Section 01 6000 - Product Requirements.
   3. Steel stud framing substrate: Self-drill hex-washer-head stainless steel with 1,000 hour salt-spray rated thermoset polyester coating.
      a. Embedment depth: 0.625 inches or three full threads minimum, whichever is greater.
      b. Minimum ultimate pull-out capacity from 18 gauge steel: 450 pounds.

2.04 METAL PANEL ACCESSORIES

A. General: Provide complete metal panel wall panel assembly incorporating trim, fascia, soffits, sills, inside and outside corners, and miscellaneous flashings. Provide manufacturer's factory-formed clips, shims, flashings, gaskets, lap tapes, closure strips, and caps for a complete installation. Fabricate and install accessories in accordance with SMACNA (ASMM).
B. Formed Flashing and Trim: Match material, thickness, and color of metal wall panel face sheets.
C. Sealants: Type recommended by metal wall panel manufacturer for application.
D. Flashing Tape: 4 inch (100 mm) wide self-adhering butyl flashing tape.
E. Fasteners: Self-tapping screws, bolts, nuts, and other acceptable fasteners recommended by the panel manufacturer. Where exposed fasteners cannot be avoided for miscellaneous applications, supply corrosion-resistant fasteners with heads matching color of metal wall panels by means of factory-applied coating.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine metal wall panel substrate with Installer present. Inspect for erection tolerances and other conditions that would adversely affect installation of metal panels.
B. Substrate: Confirm that substrate is within tolerances acceptable to metal panel system manufacturer.
    1. Maximum substrate and framing deviations from flat plane acceptable:
        a. 1/4 inch in 20 feet vertically or horizontally.
        b. 1/2 inch across building elevation.
        c. 1/8 inch in 5 feet.
C. Framing: Inspect framing that will support metal panels to determine if support components are installed as required. Confirm presence of acceptable framing members at recommended spacing to match installation requirements of metal panels.
D. Openings: Verify that window, door, louver, and other penetrations match layout on shop drawings.
E. Correct out-of-tolerance work and other deficient conditions prior to proceeding with metal panel system installation.
F. Verify that building framing members are ready to receive panels.
G. Verify that weather barrier has been installed over substrate completely and correctly.

3.02 ATTACHMENT/SUPPORT SYSTEM INSTALLATION

A. Preparation:
    1. Verify vertical girt spacing and framing clearances relative to studs or other points of attachment.
    2. Verify vertical girt does not cantilever past rigid insulation.
B. Installation:
    1. Install vertical girts in vertical orientation in strict accordance with manufacturer’s installation instructions.
    2. Do not use shims to plumb the wall between the vertical girt and insulation.
    3. Minimum length of installed cut girt is 24-inches and shall be attached with at least two (2) fasteners.
    4. Mount box girts, fastened up to 32 inches on center (as determined by the manufactures engineering calculations) over installed rigid insulation, using one wall anchor per pre-punched attachment hole at spacing indicated on engineering calculations.
        a. Check plumb of vertical girts both parallel and perpendicular to the structure.

b. Tighten screws that attach vertical girt through insulation to substructure to a snug tight condition and not stripped. Do not over-torque beyond manufacturer's recommendation. If installed using hand tools, verify for each installer at beginning of project using snug-tight criteria. Do not use stripped holes.
c. Where obstructions are present and unavoidable (i.e. window openings), use laser or chalk line to restart girt.
d. Locate vertical girt at jamb conditions and outside corner conditions.
e. Use shearing instruments (i.e. snips, nibbler, etc.) for cutting metal framing components. Saws are not recommended, as the sparks produced during cutting will damage the anti-corrosion coating. If sparks are generated during cutting, be sure the portion of the component to be installed on the building is protected from sparks and that any stockpile near the cutting station is also protected.
f. The system's components should not be cut while installed on the building, unless using a shearing instrument.
g. Replace thermal isolator pieces that break during installation.
h. Provide a 3/8 inch - 1/2 inch gap between girts for expansion when multiple lengths of vertical girts are installed.

5. Attach secondary horizontal rails to vertical girts plumb, straight and square.
   a. Tighten screws to a snug tight conditions and not stripped. Do not use stripped holes or screws.
   b. Shims can be used between horizontal rail and vertical girt or cladding panel and horizontal rail (if approved by cladding manufacturer). Shims cannot be used between vertical girt and insulation.
   c. Both flanges/edges of stiffened horizontal rail must be attached to vertical girt.

3.03 METAL PANEL INSTALLATION

A. General: Install metal panels in accordance with approved shop drawings and manufacturer's recommendations. Install metal panels in orientation, sizes, and locations indicated. Anchor metal panels and other components securely in place. Provide for thermal and structural movement.
B. Attach panels to metal framing using recommended clips, screw, fasteners, sealants, and adhesives indicated on approved shop drawings.
   1. Fasteners: Stainless-steel for exterior locations and locations where exposed to moisture; carbon steel for interior use only.
   2. At Concealed Fastener Metal Panel System: Fasten metal panels to supports with concealed clips at each joint at location, spacing, and with fasteners recommended by manufacturer. Install clips to supports with self-tapping fasteners.
   3. Provide weatherproof escutcheons for pipe and conduit penetrating exterior walls.
   4. Dissimilar Materials: Where elements of metal panels system will come into contact with dissimilar materials, treat faces, and edges in contact with dissimilar materials as recommended by manufacturer.
C. Joint Sealers: Install joint sealants where indicated on approved shop drawings.

3.04 ACCESSORY INSTALLATION

A. Install metal panel accessories with positive anchorage to building and provide for thermal expansion. Coordinate installation with flashings and other components.
   1. Install related flashings and sheet metal trim per Section 07 6200.
   2. Install components required for a complete metal panel assembly, including trim, copings, corners, lap strips, flashings, sealants, fillers, closure strips, and similar items.
   3. Comply with performance requirements and manufacturer's written installation instructions.

4. At Concealed Fastener Metal Panel System: Provide concealed fasteners except where noted on approved shop drawings.
5. Set units true to line and level as indicated.

3.05 FIELD QUALITY CONTROL

A. Manufacturer's Field Service: Engage a service representative authorized by metal wall panel manufacturer to inspect completed installation. Submit written report.
B. Correct deficiencies noted in manufacturer's report.

3.06 CLEANING AND PROTECTION

A. Remove temporary protective films. Clean finished surfaces as recommended by metal wall panel manufacturer. Clear weep holes and drainage channels of obstructions, dirt, and sealant. Maintain in a clean condition during construction.
B. Replace damaged panels and accessories that cannot be repaired by finish touch-up or minor repair.

END OF SECTION 07 4213

SECTION 07 4264

METAL COMPOSITE WALL AND SOFFIT PANELS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Furnish all labor, materials, equipment, tools, and services to fully complete all Metal Composite Wall and Soffit Panel work as is indicated on the drawings or specified herein including, but not limited to, the following described items.
B. Pressure Equalized Rainscreen System consisting of formed metal composite material (ACM) sheet, secondary supports, and anchors to structure, attached to solid backup.
C. Matching flashing and trim.
D. Do not include sales tax, refer to Section 00 1115 - Advertisement for Prequalification of Bidders.

1.02 RELATED REQUIREMENTS

A. Section 05 4000 - Cold-Formed Metal Framing: Panel support framing.
B. Section 07 2100 - Building Insulation.
C. Section 07 2500 - Membrane Weather Barriers: Water-resistive barrier behind wall panel system.
D. Section 07 4212 - Composite Subframing Girt System.
E. Section 07 6200 - Sheet Metal Flashing and Trim: Metal flashing components integrated with this wall system.
F. Section 07 9200 - Joint Sealants: Sealing joints between siding and adjacent construction and fixtures.

1.03 REFERENCE STANDARDS

1.04 ADMINISTRATIVE REQUIREMENTS

A. Pre-Installation Meeting: Convene one week before starting work of this section to verify project requirements, coordinate with installers of other work, establish condition and completeness of building substrate, and review manufacturers' installation instructions and warranty requirements.
    1. Require attendance by the installer and relevant sub-contractors.
    2. Review in detail truck transportation, parking, vertical transportation, schedule, personnel, installation of adjacent materials and substrate.
    3. Review procedures for protection of work and other construction.
    4. Review safety precautions.

1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.
B. Product Data - ACM Sheets: Manufacturer's data sheets on each product to be used, including thickness, physical characteristics, finish, and:
    1. Finish manufacturer's data sheet showing physical and performance characteristics.
    2. Storage and handling requirements and recommendations.
    3. Fabrication instructions and recommendations.
    4. Specimen warranty for finish, as specified herein.
C. Product Data - Wall System: Manufacturer's data sheets on each product to be used, including:
    1. Physical characteristics of components shown on shop drawings.
    2. Storage and handling requirements and recommendations.

3. Installation instructions and recommendations.
4. Specimen warranty for wall system, as specified herein.

D. Shop Drawings: Show layout and elevations, dimensions and thickness of panels, connections, details and location of joints, sealants and gaskets, method of anchorage, support clips, exposed fasteners, number of anchors, supports, reinforcement, trim, flashings, and accessories.
1. Indicate panel numbering system.
2. Differentiate between shop and field fabrication.
3. Indicate substrates and adjacent work with which the wall system must be coordinated.
4. Include large-scale details of anchorages and connecting elements.
5. Include large-scale details or schematic, exploded or isometric diagrams to fully explain flashing at a scale of not less than 1-1/2 inches per 12 inches.
6. Include design engineer's stamp or seal on shop drawings for attachments and anchors.

E. Selection Samples: For each finish product specified, submit at least three sample color chips representing manufacturer's standard range of available colors and patterns.
1. Sealant Color: Color as selected by Architect.

F. Verification Samples: For each finish product specified, submit at least three samples, minimum size 12 inch square, and representing actual product in color and texture.

G. Design Data: Submit structural calculations stamped by design engineer, for Architect's information and project record.

H. Test Report: Submit report of full-size mock-up tests for air infiltration, water penetration, and wind performance.

I. Manufacturer's Field Reports: Provide within 48 hours of field review. State what was observed and what changes, if any, were requested or required.

J. Manufacturer's qualification statement.

K. Installer's qualification statement.

L. Testing agency's qualification statement.

M. Maintenance Data: Care of finishes and warranty requirements.

N. Executed Warranty: Submit warranty and ensure that forms have been completed in Murray City School District 's name and registered with manufacturer.

1.06 QUALITY ASSURANCE

A. Field Measurements: Verify actual dimensions by field measurement before fabrication; show recorded measurements on shop drawings.

B. Manufacturer Qualifications: Company specializing in manufacturing wall panel systems specified in this section.
1. With minimum three years of documented experience.
2. Approved by ACM sheet manufacturer.
3. Submit contact names and phone numbers for at least three references connected with successful past projects.

C. Installer Qualifications: Company specializing in performing work of type specified in this section.
1. With minimum three years of documented experience.
2. Approved by wall panel system manufacturer.
3. Submit contact names and phone numbers for at least three references connected with successful past projects.

D. Testing Agency Qualifications: Independent agency experienced in testing assemblies of the type required for this project and having the necessary facilities for full-size mock-up testing of the type specified.

1.07 MOCK-UPS

A. See Section 01 4000 - Quality Requirements for additional requirements.
B. Provide a mock-up for evaluation of fabrication workmanship.
C. Locate where directed.
D. Provide specified finish on panels.
E. Mock-up may remain as part of work.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Deliver products in manufacturer's original, unopened, undamaged containers with identification labels intact.
    1. Package for protection against transportation damage.
    2. Provide markings to identify components consistently with drawings.
B. Store products protected from exposure to harmful weather conditions and at temperature conditions recommended by manufacturer.
    1. Store at a slope to ensure positive drainage of accumulated water.
    2. Do not store in enclosed space where ambient temperature can exceed 120 degrees F.

1.09 WARRANTY / GUARANTEE

A. See Section 01 7800 - Closeout Submittals for additional warranty requirements.
B. The Contractor shall guarantee his work for a period of One (1) year from date of Substantial Completion. Guarantee shall be on form included in Section 01 7800.
C. Wall System Warranty: Provide written warranty by manufacturer agreeing to correct defects in manufacturing within a 5-year period after Date of Substantial Completion.
D. ACM Sheet Manufacturer’s Finish Warranty: Provide manufacturer's written warranty stating that the finish will perform as follows for minimum of 20 years:
    1. Chalking: No more than that represented by a No. 8 rating based on ASTM D4214.
    2. Color Retention: No fading or color change in excess of 5 Hunter color difference units, calculated in accordance with ASTM D2244.
    3. Gloss Retention: Minimum of 30 percent gloss retention, when tested in accordance with ASTM D523.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Metal Composite Material (MCM) Sheet Manufacturers:
    1. Basis of Design Manufacturer.
        a. Reynobond: www.arconic.com.
B. Other Manufacturers
    1. Alfrex, LLC; Alfrex fr: www.alfrexusa.com.
    2. ALPOLIC Materials: www.alpolic-americas.com.
    3. 3A Composites USA; Alucobond: www.alucobondusa.com.
    4. Basis of Design Manufacturer:
        a. Elward Systems Corporation: www.elward.com.
            1) System: PER - Pressure Equalized Rainscreen.
C. Attachment/Support Framing System:
    1. Basis of Design Manufacturer:
        a. CI by Knight Wall Systems; knightwallsystems.com.
D. Substitutions: See Section 01 6000 - Product Requirements.

2.02 WALL PANEL SYSTEM

A. Panels: 2 inch maximum deep pans formed of metal composite material sheet by routing back edges of sheet, folding edges and attaching to aluminum perimeter extrusions with integral weather-stripping and ventilation slots.
   1. Exposed edges to be protected by aluminum extrusion.
   2. Wrap panel over extrusion and attach with rivets painted to match panel color. Extrusions to be painted to match panel color.
   3. Reveals at Panel: Joint size between the faces of the perimeter extrusions shall be 1/2 inch (13 mm) nominal.
   4. Maintain maximum panel bow of 0.8 percent of panel dimension in width and length; provide stiffeners of sufficient size and strength to maintain panel flatness without showing local stresses or read-through on panel face.
      a. Stiffeners: Extruded aluminum sections secured to edge trim and bonded to rear face of panel with silicone.
   5. Metallic Finished Panels: Maintain consistent grain of ACM sheet; specifically, do not rotate sheet purely to avoid waste.
   6. Fabricate panels under controlled shop conditions.
   7. Where final dimensions cannot be established by field measurement before commencement of manufacturing, make allowance for field adjustments without requiring field fabrication of panels.
   8. Fabricate as indicated on drawings and as recommended by ACM sheet manufacturer.
      a. Make panel lines, breaks, curves, and angles sharp and true.
      b. Keep plane surfaces free from warp or buckle.
      c. Keep panel surfaces free of scratches or marks caused during fabrication.
   9. Provide joint details providing a watertight and structurally sound wall panel system that allows no uncontrolled water penetration on inside face of panel system.

2.03 MATERIALS

A. Metal Composite Material (ACM) Sheet: Two sheets of aluminum sandwiching a solid core of extruded thermoplastic material formed in a continuous process with no glues or adhesives between dissimilar materials; core material free of voids and spaces; no foamed insulation material content.

B. Overall Sheet Thickness: 4 mm, minimum.
   1. Face Sheet Thickness: 0.020 inches, minimum.
   2. Alloy: AA3000 Series aluminum sheet.
   3. Bond and Peel Strength: No adhesive failure of the bond between the core and the skin nor cohesive failure of the core itself below 22.4 inch-pound/inch with no degradation in bond performance, when tested in accordance with ASTM D1781, simulating resistance to panel delamination, after 8 hours of submersion in boiling water and after 21 days of immersion in water at 70 degrees F.
   4. Surface Burning Characteristics: Flame spread index of 25, maximum; smoke developed index of 450, maximum; when tested in accordance with ASTM E84.
   5. Flammability: Self-ignition temperature of 650 degrees F or greater, when tested in accordance with ASTM D1929.
   6. PVDF Fluoropolymer: AAMA 2605. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
      a. Colors:
         1) Color 1 shall be Reynobond Color Weld 500 - Brite Red.

2) Color 2 shall be Reynobond Color Weld 500 - Bone White.

C. Aluminum Extrusions:
   1. Perimeter Extrusions:
      a. Alloy: AA-6063-T6.
      b. Finish: Same finish as ACM sheets, color to match.
   2. Stiffeners:
      a. Alloy: AA-6063-T6.
      b. Finish: Mill finish.

2.04 ACCESSORIES

A. Fasteners:
   1. Dual-hardened fastener with self-drilling point and self-tapping thread that meets SAE J429 Grade 5 and ASTM A449 strength and ductility requirements as recommended by manufacturer.
      a. Acceptable Product: Drill-Flex Fastener manufactured by ELCO Textron, Inc.
   2. Typical joinery shall be attached with concealed fasteners. When exposed fasteners are required in isolated conditions, the fastener shall be obscured in the panel joinery.
B. Bituminous Coating: Cold-applied asphalt mastic, noncorrosive compound free of asbestos, sulfur, and other deleterious impurities; 15-mil dry film thickness per coat.
C. Gaskets: Santoprene or EPDM as recommended by manufacturer.
D. Sealers: As recommended by manufacturer.

2.05 FABRICATION

A. Fabricate panel units to dimensions indicated on the guaranteed dimension shop drawings based on an assumed design temperature of plus-70 degrees F. Allow for ambient temperature range at time of fabrication and erection.
B. Fabricate panels in sizes shown using ACM and perimeter extrusion so that the panel thickness at the joinery is no more than 1.75 inches. Completed panel shall be properly fabricated and designed so that no restraints are placed on the panel, which might result in excessive compressive skin stresses. The installation detailing shall be such that the installed panels shall remain flat due to temperature changes and at all times remain water and air-tight. Oil canning of panel surface is not acceptable.
C. Where practical, shop fabricate units ready for erection. If not shop assembled, pre-fabricate components at the shop as required for proper and expeditious field assembly.
D. Design, fabricate, assemble, and erect wall panel units, to insure a weather tight system, as required in this specification section.
E. Where drawings indicate, factory curve panels to required radii. Extrusions shall be factory stretched formed to conform to panel curve.
F. Provide stiffeners secured to rear face of panels mechanically fastened to edge trim members, with spacing as required by specific job wind loading.

2.06 ATTACHMENT/SUPPORT FRAMING SYSTEM

A. Comply with ANSI/ASHRAE 90.1-2010 definition of continuous insulation (c.i.).
B. Coating Material: ASTM A1046, Zinc-Aluminum-Magnesium, minimum thickness ZM40.
   1. ASTM A653 Galvanized steel is not acceptable.
C. Steel Classification: Structural Steel (SS), Grade 50, 50 ksi yield.
D. Spacing: Comply with manufacturer’s Professional Engineers calculations.
E. Vertical Girt: Vertical girt with pre-punched attachment holes, directly attached on top of rigid insulation at regular spacing, with engineered thermally isolated washer assembly and fasteners.

1. Steel Thickness: Minimum 0.046-inch thick (18 gauge).

F. Profile Depth: 0.75 inches.
   1. Girt Fastening Face Width: 2 inches.
   2. Basis of Design: CI by Knight Wall Systems.
   3. Substitutions: See Section 01 6000 - Product Requirements.

G. Fasteners:
   1. Sufficient length to provide solid attachment through rigid insulation to structure as required by manufacturer.
   2. Thermal Isolating Washers: Minimum 0.125 inch thick Polyoxymethylene copolymer (POM) washers with integral centering lip to act as a thermal break between wall anchorfasteners and girt.
      a. Tensile Yield Strength: 9.57 ksi per ISO 527.
      b. Melting Temperature: 329 degrees Fahrenheit per ISO 3146.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine dimensions, tolerances, and interfaces with other work.
B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
C. Notify Architect in writing of conditions detrimental to proper and timely completion of work, and do not proceed with erection until unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Protect adjacent work areas and finish surfaces from damage during installation.

3.03 INSTALLATION

A. Comply with instructions and recommendations of ACM sheet manufacturer and wall system manufacturer, as well as with approved shop drawings.
B. Install wall system securely allowing for necessary thermal and structural movement; comply with wall system manufacturer's instructions for installation of concealed fasteners.
C. Do not handle or tool products during erection in manner that damages finish, decreases strength, or results in visual imperfection or failure in performance. Return component parts that require alteration to shop for refabrication, if possible, or for replacement with new parts.
D. Do not form panels in field unless required by wall system manufacturer and approved by the Architect; comply with ACM sheet manufacturer's instructions and recommendations for field forming.
E. Separate dissimilar metals; use gasket fasteners, isolation shims, or isolation tape where needed to eliminate possibility of electrolytic action between metals. Apply a coat of bituminous paint, concealed, on one or both surfaces wherever dissimilar metals would be in contact.
   1. Deviation of Horizontal Member From True Line: 0.1 inch in 25 feet run, maximum.
   2. Exception: Field repairs of minor damage to finishes are permitted only when approved in writing by Architect, panel manufacturer, and fabricator.
   3. Field Repairs to Finishes: Using materials and methods sufficient that repairs are not discernible when viewed at distance of 10 feet under all typical light conditions experienced at the project.

3.04 FIELD QUALITY CONTROL

A. See Section 01 4000 - Quality Requirements for additional requirements.

B. Wall System Manufacturer's Field Services: Provide field services consisting of product use recommendations and periodic site visits for inspection of product installation in accordance with instructions.
C. Site Visits: Schedule three site visits during execution of installation.

3.05 CLEANING

A. Ensure weep holes and drainage channels are unobstructed and free of dirt and sealants.
B. Remove protective film after installation of joint sealers, after cleaning of adjacent materials, and immediately prior to completion of work.
C. Remove temporary coverings and protection of adjacent work areas.
D. Clean installed products in accordance with manufacturer's instructions.

3.06 PROTECTION

A. Protect installed panel system from damage until Date of Substantial Completion.

END OF SECTION 07 4264

This page intentionally left blank

SECTION 07 5419

PVC THERMOPLASTIC SINGLE-PLY ROOFING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Furnish all labor, materials, equipment, tools and services required to fully complete all Membrane Roofing work as is indicated on the drawings or specified herein including, but not limited to, the following described items.
B. Mechanically attached PVC thermoplastic roofing membrane.
   1. Ballasted where occurs, refer to roof plan.
C. Insulation, flat and tapered.
D. Vapor retarder.
E. Flashings.
F. Roofing stack boots, roofing expansion joints, and walkway pads.

1.02 RELATED REQUIREMENTS

A. Section 05 3100 - Steel Decking.
B. Section 06 1000 - Rough Carpentry: Wood nailers and curbs.
C. Section 07 4113 - Metal Roof and Soffit Panels.
D. Section 07 6200 - Sheet Metal Flashing and Trim: Counterflashings, reglets and copings.
E. Section 07 7200 - Roof Hatches and Accessories.
F. Division 22 - Plumbing Piping Specialties: Roof drains.
G. Division 23 - Mechanical: Prefabricated curb for mechanical equipment.

1.03 REFERENCE STANDARDS

A. ASTM C578 - Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation; 2019.
B. ASTM C1177/C1177M - Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing; 2017.
C. ASTM C1289 - Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board; 2022.
D. ASTM D4434/D4434M - Standard Specification for Poly(Vinyl Chloride) Sheet Roofing; 2021.
E. ASTM E96/E96M - Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials; 2021.
F. ASTM E1980 - Standard Practice for Calculating Solar Reflectance Index of Horizontal and Low-Sloped Opaque Surfaces; 2011 (Reapproved 2019).
G. FM (AG) - FM Approval Guide; current edition.
H. FM DS 1-28 - Wind Design; 2016.
I. FM DS 1-29 - Roof Deck Securement and Above-Deck Roof Components; Factory Mutual System; 2016.
J. UL (DIR) - Online Certifications Directory; Current Edition.
K. UL (FRD) - Fire Resistance Directory; Current Edition.
L. UL 790 - Standard for Standard Test Methods for Fire Tests of Roof Coverings; Current Edition, Including All Revisions.
M. NRCA ML104 - The NRCA Roofing and Waterproofing Manual; Fifth Edition, with interim updates.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene one week before starting work of this section.

1. Require attendance by all affected installers
2. Review preparation and installation procedures and coordinating and scheduling required with related work.

B. Coordinate with installation of associated counterflashings installed under other sections.

1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide manufacturer's written information listed below.
   1. Product data indicating membrane materials, flashing materials, insulation, vapor retarder, surfacing, and fasteners.
   2. Preparation instructions and recommendations.
   3. Storage and handling requirements.
C. Manufacturer's Qualification Statement.
D. Installer's Qualification Statement.
E. Specimen Warranty: For approval.
F. Shop Drawings: Indicate joint or termination detail conditions, conditions of interface with other materials, setting plan for tapered insulation, and mechanical fastener layout.
G. Samples for Verification: Submit two samples 6 x 6 inches in size illustrating insulation.
H. Manufacturer's Installation Instructions: Indicate membrane seaming precautions and perimeter conditions requiring special attention.
I. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
J. Manufacturer's Field Reports: Indicate procedures followed, ambient temperatures, humidity, wind velocity during application, and supplementary instructions given.
K. Warranty:
   1. Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.
   2. Submit installer's certification that installation complies with all warranty conditions for the waterproof membrane.

1.06 QUALITY ASSURANCE

A. Perform work in accordance with NRCA Roofing and Waterproofing Manual.
   1. Maintain one copy on site.
B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum five (5) years of documented experience.
C. Installer Qualifications: Company specializing in performing the work of this section:
   1. With minimum five (5) years documented experience.
   2. Approved by membrane manufacturer.
   3. Extend manufacturer's labor and materials guarantee.
   4. Extend manufacturer's No Dollar Limit guarantee.
D. Single Source Responsibility: Provide and install products from single source.
E. See drawings and details for type, quantity, and location of moisture protection work required. Include all administration, facilities and labor required to furnish the expertise, degree of workmanship, materials and accessories, necessary for the timely and satisfactory integration of the following items into the total building system in compliance with the specifications. The work throughout shall be completed in a manner to assure that no water leakage into the roof system or building results. All details (including metal flashings) relating to the installation of the roof system, shall be approved by the roofing contractor or manufacturer.

F. Contractor's Review: Along with Manufacturer's Data, submit written statement signed by contractor and the roofing subcontractor, stating that the architect's drawings and specifications for roofing and flashing have been reviewed with an agent of the manufacturer of the primary roofing materials, and that he is in agreement that the selected systems for roofing and flashing are proper, compatible, and adequate for the applications shown, and that the conditions and details are not in conflict with the roofing manufacturer's roofing and flashing warranty requirements. Show by copy of transmittal form that copy of statement has been transmitted to roofing manufacturer. (A signed, reviewed copy of the manufacturer's notice of award will satisfy this requirement.)

G. Statement of Application: Upon completion of work, submit a statement signed by contractor and roofing subcontractor, stating that the roofing and membrane flashing comply with these specifications, and that the installation methods comply with the manufacturer's printed instructions and are proper and adequate for the conditions of installation and use.

1.07 MOCK-UP

A. Provide mock-up for evaluation of surface preparation, installation methods, and workmanship. mock-up.
B. See Section 01 4000 - Quality Requirements for additional requirements.
C. Locate where directed.
D. Mock-up may remain as part of the Work.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Deliver products in manufacturer's original containers, dry, undamaged, with seals and labels intact.
B. Store products in weather protected environment, clear of ground and moisture.
C. Protect foam insulation from direct exposure to sunlight.

1.09 FIELD CONDITIONS

A. Do not apply roofing membrane during unsuitable weather.
B. Do not apply roofing membrane to damp or frozen deck surface or when precipitation is expected or occurring or when ambient temperature is below 40 degrees Fahrenheit
C. Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed the same day.

1.10 WARRANTY

A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
B. Correct defective Work within a One (1) years period after Date of Substantial Completion.
C. System Warranty: Provide manufacturer's system warranty agreeing to repair or replace roofing that leaks or is damaged due to wind or other natural causes.
    1. Warranty Term: 20 + 10 year manufacturer's material and labor warranty to cover failure to prevent penetration of water.
        a. Warranty shall include Inflationary Coverage.
    2. For repair and replacement include costs of both material and labor with no dollar limitation in warranty.
    3. Factory Mutual Classification: Windstorm resistance of I-90, in accordance with FM DS 1-28.
    4. The maximum wind speed coverage shall be peak gusts of 120 mph (193 km/h) measured at 33 feet above ground level.
    5. Certification is required with bid submittal indicating the manufacturer has reviewed and agreed to such wind coverage.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Basis of Design Manufacturer:
   1. Sika-Sarnafil, Inc.; Product - "S327 Sarnafast" (80 mil reinforced PVC): www.sarnafilus.com.

B. The following manufacturers shall be allowed to bid as a proposed substitute with add or deduct from Base Bid. Proposed substitutes shall be prepared to furnish published literature verifying that the proposed substitution meets all requirements of the Specifications and is suitable for the intended use. The Owner will evaluate any proposed substitutions and will make the final determination as to whether or not the product is acceptable to them for this project.
   1. Johns Manville; Product - JM KEE PVC 80 mil Minimum: www.jm.com.
   2. Carlisle SynTec Inc. Sure-Flex KEE PVC 80 mil Minimum: www.carlisle-syntec.com

C. Cover Board - Where occurs, see roof plan.
   1. As supplied and warranted by roofing membrane manufacturer.

2.02 ROOFING APPLICATIONS

A. PVC Membrane Roofing: One ply membrane, mechanically fastened, over vapor retarder and insulation.

B. Roofing Assembly Performance Requirements and Design Criteria:
   1. Roof Covering External Fire Resistance Classification: Class B when tested per UL 790.
   2. Factory Mutual Classification: Class I and windstorm resistance of I-90, in accordance withFM DS 1-28
   3. Thermal Performance:

2.03 ROOFING MEMBRANE AND ASSOCIATED MATERIALS

A. Membrane:
   1. Material: Polyvinyl chloride complying with ASTM D4434/D4434M, type III
   2. Thickness: 80 mils (0.080 inch), minimum.
   3. Sheet Width: 78-3/4 or 120 inch
   4. Color: White.
   5. Tearing strength: (ASTM D 751 - Tongue Tear), 80 lb. minimum.
   6. Dimension stability: (ASTM D 1204, 72 hours, 176 degree F) 0.1%.
   7. Low temperature bend: (ASTM D 2136) -40 degrees Fahrenheit maximum.
   8. Tensile strength: (psi) (ASTM D 638), 1600.
   9. Seam strength: (ASTM D 638), 80% of tensile strength.

B. Seaming Materials: As recommended by membrane manufacturer.

C. Membrane Fasteners: As recommended and approved by membrane manufacturer.
   1. Disc Washers and Screws: 3 inch diameter.
   2. Fasteners shall be corrosion-resistant screws of anchors of a type, size and length appropriate for fastening through protection insulation layer to the structural roof deck recommended and warranted by the roofing manufacturer for the specified ratings.

D. Vapor Retarder: Material approved by roof manufacturer complying with requirements of fire rating classification; compatible with roofing and insulation materials.
   1. Fire-retardant adhesive.
   2. Sheet polyethylene; 6 mil thick.

E. Flexible Flashing Material: Same material as membrane, conforming to the following:
   1. Thickness: 60 mil.
   2. Tensile Strength: 1,200 psi.
   3. Elasticity: 50 percent with full recovery without set.

2.04 PARAPET WALL SHEATHING

A. Either product listed below may be used at Contractor's Option.
B. Parapet Wall Sheathing: Fiber-reinforced gypsum panels, ASTM C1278, Type X fire-resistant type, 5/8 inch thick.
   1. Products: USG Securock Gypsum-Fiber Roof Board: www.usg.com
   2. Substitutions: See Section 01 6000 - Product Requirements.
C. Parapet Wall Sheathing: Glass mat faced gypsum panels, ASTM C1177/C1177M, fire resistant type, 5/8 inch thick.
   1. Products:
      a. Georgia-Pacific DensDeck Prime: www.densdeck.com
      b. Temple-Inland, Inc.; GreenGlass Primed Roof Board: www.templeinland.com
      c. Substitutions: See Section 01 6000 - Product Requirements

2.05 COVERBOARD

A. Cover Board: Glass mat faced gypsum panels, ASTM C1177/C1177M, fire resistant type,
   1. Thickness: 1/4 inch.
   2. 2. Products:
      a. USG Securock; Glass-Mat Roof Board: www.usg.com.
      b. Georgia-Pacific; DensDeck: www.gp.com/build.
      c. Temple-Inland, Inc; GreenGlass Roof Board: www.templeinland.com.
      d. Substitutions: See Section 01 6000 - Product Requirements.

2.06 INSULATION

A. Expanded Polystyrene (EPS) Tapered Board Insulation: ASTM C578, Type II; molded expanded polystyrene board with natural skin surfaces, with the following characteristics:
   1. Tapered Board: Slope as indicated; minimum thickness 1/2 inch; fabricate of fewest layers possible.
   2. Compressive Strength: 15 pounds per square inch.
   3. Board Edges: Square.
   4. Board Size: 48 x 48 inch (1220 x 1220 mm).
   5. Product: Selected roofing manufacturer supplied
B. Polyisocyanurate Board Insulation: ASTM C1289, Type II, Class 1, fiber reinforced felt both faces; Grade 2 and with the following characteristics:
   1. Compressive Strength: 20 psi.
   2. Board Size: 48 x 96 inch (1220 x 2440 mm).
   3. Thermal Resistance: aged value shall be based upon 15 year time weighted average LTTR (long term thermal resistance).
      a. R-Value: R-30.
      b. 1 1/2 inch thickness at canopies as indicated in Drawings.
      c. 2 inches at parapet walls as indicated in Drawings.
   4. Board Edges: Square.
   5. Manufacturers:
      a. Selected roofing manufacturer supplied.

2.07 ACCESSORIES

A. Prefabricated Roofing Expansion Joint Flashing: Sheet Flashing Strip Hot-Air Welded over compatible closed-cell foam rod tubing seamed to membrane or sheet flashing.
B. Prefabricated Flashing Accessories:

1. Corners and Seams: Same material as membrane, in manufacturer's standard thicknesses.
2. Penetrations: Same material as membrane, with manufacturer's standard cut-outs, rigid inserts, clamping rings, and flanges.
3. Walkway : Suitable for maintenance traffic, contrasting color or otherwise visually distinctive from roof membrane.
   a. Surface Color: gray
   b. 39 inch wide
4. Contour Rib Profile: Manufacturer's standard extruded PVC; 1-1/4 inch tall, 2-1/8 inch wide, 3/8 inch profile.
5. Miscellaneous Flashing: Non-reinforced PVC membrane; 60 mils (0.060 inch) thick, in manufacturer's standard lengths and widths.

C. Insulation Fasteners: Appropriate for purpose intended and approved by roofing manufacturer.
   1. Length as required for thickness of insulation material and penetration of deck substrate, with metal washers.
D. Membrane Adhesive: As recommended by membrane manufacturer.
E. Surface Conditioner for Adhesives: Compatible with membrane and adhesives.
F. Sealants: As recommended by membrane manufacturer.
G. Cleaner: Manufacturer's standard, clear, solvent-based cleaner.

PART 3 EXECUTION

3.01 INSTALLATION - GENERAL

A. Perform work in accordance with manufacturer's instructions.
B. Do not apply roofing membrane during unsuitable weather.
C. Do not apply roofing membrane when ambient temperature is outside the temperature range recommended by manufacturer.
D. Do not apply roofing membrane to damp or frozen deck surface or when precipitation is expected or occurring.
E. Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed the same day.
F. Coordinate the work with installation of associated counterflashings installed by other sections as the work of this section proceeds.
G. When substrate preparation is responsibility of another installer, notify Architect of unsatisfactory conditions before proceeding.

3.02 EXAMINATION

A. Verify that surfaces and site conditions are ready to receive work.
B. Verify deck is supported and secure.
C. Verify deck is clean and smooth, flat, free of depressions, waves, or projections, properly sloped and suitable for installation of roof system.
D. Verify deck surfaces are dry and free of snow or ice.
E. Verify that roof openings, curbs, and penetrations through roof are solidly set, and reglets are in place.

3.03 PREPARATION, GENERAL

A. Clean substrate thoroughly prior to roof application.
B. Do not begin work until other work that requires foot or equipment traffic on roof is complete.
C. Apply manufacturer's recommended vapor retarder or temporary roof before roof installation.

3.04 VAPOR RETARDER AND INSULATION

A. Apply vapor retarder to deck surface in accordance with manufacturer's instructions.
   1. Extend vapor retarder under cant strips and blocking to deck edge.
   2. Install flexible flashing from vapor retarder to air seal material of wall construction, lap and seal to provide continuity of the air barrier plane.
B. Ensure vapor retarder is clean and dry, continuous, and ready for application of insulation.
C. Attachment of Insulation:
   1. Mechanically fasten each layer of insulation to deck in accordance with roofing manufacturer's instructions and Factory Mutual requirements.
   2. Clip fasteners to project 1 inch from underside of deck
D. Lay subsequent layers of insulation with joints staggered minimum 6 inch from joints of preceding layer.
E. Place tapered insulation to the required slope pattern in accordance with manufacturer's instructions.
F. On metal deck, place boards parallel to flutes with insulation board edges bearing on deck flutes.
G. Lay boards with edges in moderate contact without forcing, and gap between boards no greater than 1/4 inch. Cut insulation to fit neatly to perimeter blocking and around penetrations through roof.
H. At roof drains, use factory-tapered boards to slope down to roof drains.
I. Do not apply more insulation than can be completely waterproofed in the same day.

3.05 COVERBOARD APPLICATION

A. Refer to roof system manufacturer's written instructions for proper installation techniques.
B. Install approved fasteners with plates into the roof boards, flush with the surface. Fasteners or adhesive should be installed in strict compliance with the roof system manufacturer’s installation recommendations and FMG Loss Prevention Data Sheet 1-29FM DS 1-29. Proper fastener spacing is essential to achieve wind-uplift performance.
C. Locate edge joints on, and parallel to, deck ribs. Stagger end joints of adjacent lengths of roof boards. Butt board edges and ends loosely in typical installations. Long, uninterrupted runs (greater than 200 feet) of roof boards may require slight gaping due to thermal expansion.

3.06 MEMBRANE APPLICATION

A. Roll out membrane, free from wrinkles or tears. Place sheet into place without stretching.
B. Shingle joints on sloped substrate in direction of drainage.
C. Seam Welding:
   1. Seam Welding: Overlap edges and ends and seal seams by heat welding, minimum 2 inches.
   2. Cover all seams with manufacturer's recommended joint covers.
   3. Probe all seams once welds have thoroughly cooled. (Approximately 30 minutes.)
   4. Repair all deficient seams within the same day.
   5. Seal cut edges of reinforced membrane after seam probe is complete.
D. Mechanical Attachment:
   1. Apply membrane and mechanical attachment devices in accordance with manufacturer's instructions and Factory Mutual (FM) requirements.
   2. Clip fasteners to project 1 inch from underside of deck.
E. At intersections with vertical surfaces:
   1. Extend membrane over cant strips and up a minimum of 4 inches onto vertical surfaces.

2. Fully adhere flexible flashing over membrane and up to counterflashing height and at parapet wall up, across top and down minimum of 2 inches on opposite face.

F. At gravel stops, extend membrane under gravel stop and to the outside face of the wall.
   1. Install in accordance with NRCA Details and roof details.
G. Around roof penetrations, seal flanges and flashings with flexible flashing.
   1. Install in accordance with NRCA Details and roof details.
H. Install roofing expansion joints where indicated. Make joints watertight.
   1. Install prefabricated joint components in accordance with manufacturer's instructions.
   2. Install in accordance with NRCA Details and roof details.
I. Coordinate installation of roof drains and sumps and related flashings.
   1. Install in accordance with NRCA Details and roof details.
J. Coordinate installation of associated counter flashings installed under other sections.
K. Coordinate installation of screws required for roofing and installation so as not to damage any interior mechanical, plumbing, electrical, etc. If damage does occur, Contractor shall repair and/or replace work as acceptable to the Architect at no additional cost to the Owner.
L. Refer to details on drawings and manufacturer's standard details.
M. Install walkway pads. Space pad joints to permit drainage.
N. Daily Seal: Install daily seal per manufacturers instructions at the end of each work day. Prevent infiltration of water at incomplete flashings, terminations, and at unfinished membrane edges.

3.07 WALKWAY INSTALLATION

A. Flexible Walkways: Install walkway products in locations indicated. Heat weld to substrate or adhere walkway products to substrate with compatible adhesive according to roofing system manufacturer's written instructions.

3.08 FIELD QUALITY CONTROL

A. See Section 01 4000 - Quality Requirements, for general requirements for field quality control and inspection.
B. Require site attendance of roofing and insulation material manufacturers daily during installation of the Work.

3.09 CLEANING

A. See Section 01 7419 - Construction Waste Management and Disposal, for additional requirements.
B. Remove wrappings, empty containers, paper, and other debris from the roof daily. Dispose of debris in compliance with local, State, and Federal regulations.
C. Remove bituminous markings from finished surfaces.
D. In areas where finished surfaces are soiled by work of this section, consult manufacturer of surfaces for cleaning advice and conform to their documented instructions.
E. Repair or replace defaced or damaged finishes caused by work of this section.

PROTECTION

A. Protect installed roofing and flashings from construction operations.
B. Where traffic must continue over finished roof membrane, protect surfaces using durable materials.

END OF SECTION 07 5419

SECTION 07 6200

SHEET METAL FLASHING AND TRIM

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Furnish all labor, materials, equipment, tools and services required to fully complete all Sheet Metal Flashing and Trim work as is indicated on the drawings and/or specified herein including, but not limited to, the following described items.
B. Fabricated sheet metal items, including copings, drip edges, flashings, counterflashings, gutters, downspouts, sheet metal roofing, and other items shown on Drawings.
C. Sealants for joints within sheet metal fabrications.
D. Reglets and accessories.
E. Furnish flashing at masonry veneer. Installation by masonry contractor.
F. Do not include sales tax, refer to Section 00 1115 - Advertisement for Prequalification of Bidders.

1.02 RELATED REQUIREMENTS

A. Section 04 2100 - Masonry Veneer: Installation of flashings in masonry.
B. Section 06 1000 - Rough Carpentry: Wood nailers for sheet metal work.
C. Section 07 7200 - Roof Hatches and Accessories: Manufactured metal roof curbs.
D. Section 07 9200 - Joint Sealants: Sealing non-lap joints between sheet metal fabrications and adjacent construction.
E. Section 09 9113 - Exterior Painting: Field painting.
F. Division 23 - HVAC: Flashing sleeves and collars for mechanical items protruding through roofing membrane.
G. Division 26 - Electrical: Flashing sleeves and collars for electrical items protruding through roofing membrane.

1.03 REFERENCE STANDARDS

A. {RSTEMP#36}
B. AAMA 621 - Voluntary Specifications for High Performance Organic Coatings on Coil Coated Architectural Hot Dipped Galvanized (HDG) and Zinc-Aluminum Coated Steel Substrates; 2002.
C. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2020.
D. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2018.
E. CDA A4050 - Copper in Architecture - Handbook; current edition.
F. SMACNA (ASMM) - Architectural Sheet Metal Manual; 2012.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene one week before starting work of this section.

1.05 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 12" x 12" in size illustrating metal finish color.

1.06 QUALITY ASSURANCE

A. Perform work in accordance with SMACNA (ASMM) and CDA A4050 requirements and standard details, except as otherwise indicated.
B. Maintain one copy of each document on site.
C. Fabricator andInstaller Qualifications: Company specializing in sheet metal work with five years ofdocumented experience.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Stack material to prevent twisting, bending, and abrasion, and to provide ventilation. Slope metal sheets to ensure drainage.
B. Prevent contact with materials that could cause discoloration or staining.

1.08 WARRANTY

A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
B. Finish Warranty: On steel manufacturer's standard form, in which manufacturer agrees to repair or replace fabricated items that evidence deterioration of finish within 20 years from date of Substantial Completion.
C. The Contractor shall guarantee his work for a period of One (1) year from date of Substantial Completion. Guarantee shall be on form included in Section 01 7800.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Pre-Finished Galvanized Sheet Steel:
    1. Drexel Metals: www.drexelmetals.com
    2. Ryerson Building Products; ColorKlad: www.reyerson.com.
    3. Peterson Aluminum Corporation; Pac-Clad: www.pac-clad.com.
    4. Firestone Metal Products; Una-Clad: www.firestonemetal.com.
    5. Substitutions: See Section 01 6000 - Product Requirements.

2.02 SHEET MATERIALS

A. Pre-Finished Galvanized Steel: ASTM A653/A653M, with G90/Z275 zinc coating; minimum 24 gage, 0.028 inch thick base metal, shop pre-coated with PVDF coating.
    1. Finish Side: PVDF (Polyvinylidene Fluoride) Coating: High Performance Organic Finish, AAMA 621, {RS#36}; multiple coat, thermally cured fluoropolymer finish system.
        a. Thickness: 1.0 mil total dry film thickness, minimum.
        b. Color: As selected by Architect from manufacturer's custom colors.
    2. Reverse Side: Manufacturer's standard polyester wash coat of 0.3 to 0.4 mil dry film thickness.

2.03 FABRICATION

A. Form sections true to shape, accurate in size, square, and free from distortion or defects.
B. Form pieces in longest possible lengths.
C. Hem exposed edges on underside 1/2 inch; miter and seam corners.
D. Form material with standing seams, except where otherwise indicated. At moving joints, use sealed lapped, bayonet-type or interlocking hooked seams. At wall copings use standing seam joints.
E. Fabricate corners from one piece with minimum 18 inch long legs; seam for rigidity, seal with sealant.

F. Fabricate vertical faces with bottom edge formed outward 1/4 inch and hemmed to form drip.
G. Fabricate flashings to allow toe to extend 2 inches over roofing gravel. Return and brake edges.
H. All flashings to be installed with continuous 18 gage galvanized steel hold downs per SMACNA Architectural Sheet Metal Manual, current edition.

2.04 GUTTER AND DOWNSPOUT FABRICATION

A. Gutters: SMACNA (ASMM) Rectangular profile.
B. Downspouts: Profile as indicated on drawings
C. Gutters and Downspouts: Size indicated.
D. Accessories: Profiled to suit gutters and downspouts.
    1. Anchorage Devices: In accordance with SMACNA (ASMM) requirements.
    2. Gutter Supports: Brackets.
    3. Downspout Supports: Brackets.
E. Downspout Boots: Steel.
F. Seal metal joints.

2.05 ACCESSORIES

A. Fasteners: Galvanized steel, with soft neoprene washers.
B. Primer: Zinc chromate type.
C. Protective Backing Paint: Zinc molybdate alkyd.
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.
    1. Manufacturers:
        a. Franklin International, Inc; Titebond WeatherMaster Metal Roof Sealant: www.titebond.com.
        b. Substitutions: See Section 01 6000 - Product Requirements.
F. Plastic Cement: ASTM D4586/D4586M, Type I.
G. Reglets: Surface mounted type, galvanized steel; face and ends covered with plastic tape.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify roof openings, curbs, pipes, sleeves, ducts, and vents through roof are solidly set, reglets in place, and nailing strips located.
B. Verify roofing termination and base flashings are in place, sealed, and secure.

3.02 PREPARATION

A. Install starter and edge strips, and cleats before starting installation.
B. Install surface mounted reglets true to lines and levels, and seal top of reglets with sealant.
C. Back paint concealed metal surfaces with protective backing paint to a minimum dry film thickness of 15 mil.

3.03 INSTALLATION

A. Conform to drawing details and SMACNA (ASMM) Architectural Sheet Metal Manual.
B. 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.
C. Secure flashings in place using concealed fasteners, and use exposed fasteners only where permitted..
D. Apply plastic cement compound between metal flashings and felt flashings.

E. Fit flashings tight in place; make corners square, surfaces true and straight in planes, and lines accurate to profiles.
F. Seal metal joints watertight.
G. Secure gutters and downspouts in place with concealed fasteners.
H. Slope gutters 1/4 inch per 10 feet, minimum.
I. Connect downspouts to downspout boots, and grout connection watertight.

3.04 FIELD QUALITY CONTROL

A. See Section 01 4000 - Quality Requirements, for field inspection requirements.
B. Inspection will involve surveillance of work during installation to ascertain compliance with specified requirements.

END OF SECTION 07 6200

SECTION 07 7200

ROOF HATCHES AND ACCESSORIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Furnish all labor, materials, equipment, tools and services required to fully complete all Roof Accessory work as is indicated in the drawings and/or specified herein including, but not limited to, the following described items.
B. Roof hatches.
C. Smoke vents.
D. Ladder Safety Post - 1- Required at each ladder to roof.
E. Do not include sales tax, refer to Section 00 1115 - Advertisement for Prequalification of Bidders.

1.02 RELATED REQUIREMENTS

A. Section 05 3100 - Steel Decking.
B. Section 07 5400 Roofing.
C. Section 07 6200 - Sheet Metal Flashing and Trim: Roof accessory items fabricated from sheet metal.

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 Murray City School District '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 DELIVERY, STORAGE, AND HANDLING

A. Store products in manufacturer's unopened packaging until ready for installation.
B. Store products under cover and elevated above grade.

1.05 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.

1.06 GUARANTEE

A. The Contractor shall guarantee his work for a period of One (1) year from date of Substantial Completion. Guarantee shall be on form included in Section 01 7800.

PART 2 PRODUCTS

2.01 ROOF HATCHES

A. Manufacturers - Roof Hatches, Smoke Vents.
   1. Acudor Products Inc: www.acudor.com.
   2. Bilco Company: www.bilco.com.
   3. Dur-Red Products: www.dur-red.com.
   4. Milcor, Inc: www.milcorinc.com.
   5. Nystrom: www.nystrom.com.
   6. MIFAB Manufacturing: www.mifab.com.
   7. Precision Ladders, LLC; www.precisionladders.com.
   8. Substitutions: See Section 01 6000 - Product Requirements.

B. Roof Hatches, General: Factory-assembled steel frame and cover, complete with operating and release hardware.
   1. Style: Provide flat metal covers.
   2. Mounting Substrate: Provide frames and curbs suitable for mounting on flat roof deck sheathing with insulation.
   3. For Ladder Access: Single leaf; 30 x 36 inches.
   4. For Ships Ladder Access: Single leaf; 30 x 54 inches.

C. Smoke and Heat Vents: Where "smoke" or "smoke/heat" operation is indicated, provide the following additional features and omit manual operation for access.
   1. Smoke Release Mechanism: Automatic opening on melting of replaceable UL (DIR) listed fusible link at 165 degrees F.
   2. UL (DIR) or FM (AG) listed as automatically operated smoke and heat vent.
   3. Fire Alarm Connection: Provide separate resettable electrical link release mechanism and connection point for fire alarm system.
   4. Loads: Fabricate heat and smoke vent to withstand a minimum 40-lbf/sq. ft. (1.9-kPa) external live load and 30-lbf/sq. ft. (1.4-kPa) uplift.
      a. When release is actuated, lid shall open against 10-lbf/sq. ft. (0.5-kPa) snow or wind load and lock in position..
   5. Fall Protection Screen:
      a. Steel, 0.163 inch diameter.
      b. 4 inch x 4 inch spacing.
   6. Size: 5 foot x 8 foot, double leaf.

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: Galvanized steel, 14 gage, 0.0747 inch thick.
   2. Finish: Manufacturer's standard factory-applied powder coat.
   3. Insulation: Manufacturer's standard; 1 inch rigid glass fiber, located on outside face of curb.

E. Metal Covers: Flush, insulated, hollow metal construction.
   1. Capable of supporting 40 psf live load.
   2. Material: Galvanized steel; outer cover 14 gage, 0.0747 inch thick, liner 22 gage, 0.03 inch thick.
   3. Finish: Manufacturer's standard factory-applied powder coat.
   4. Insulation: Manufacturer's standard 1 inch rigid glass fiber.
   5. Gasket: EPDM, continuous around cover perimeter.

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 load.
2. Hinges: Manufacturer's recommended type.
3. Hold open arm with vinyl-coated handle for manual release.
4. Latch: Upon closing, engage latch automatically and reset manual release.
5. Manual Release: Pull handle on interior.
6. Locking: Padlock hasp on interior.

2.02 LADDER SAFETY POST

A. Steel, zinc coated, safety post.
B. Install on fixed ladder below hatch cover. Device shall be designed with a telescoping tubular section that locks automatically when fully extended. Upward and downward movement shall be controlled by a stainless steel spring balancing mechanism. Unit shall be completely assembled with fasteners for securing to the ladder rungs in accordance with the manufacturer's instructions.
C. Performance Requirements: Fabricate safety post to comply with OSHA 1910.27 for fixed ladders. Must support 200 pound load.
D. Post: 1 1/2" x 1 1/2" Steel square tubing- high strength. A pull up loop shall be provided at the upper end of the post to facilitate raising the post.
E. Finish: Powder coat paint, Safety Yellow.
F. Spring assist: Stainless steel balancing spring mechanism shall be provided to provide smooth, easy, controlled operation when raising and lowering the safety post.
G. Hardware: All mounting hardware shall be stainless steel.
H. Required at all ladders to roof
I. Ladder Safety Post, model LU-1 by Babcock Davis or equal.

PART 3 EXECUTION

3.01 EXAMINATION

A. Do not begin installation until substrates have been properly prepared.
B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.02 PREPARATION

A. Clean surfaces thoroughly prior to installation.
B. Prepare surfaces using methods recommended by manufacturer for achieving acceptable results for applicable substrate under project conditions.

3.03 INSTALLATION

A. Install in accordance with manufacturer's instructions, in manner that maintains roofing system weather-tight integrity.

3.04 CLEANING

A. Clean installed work to like-new condition.

3.05 PROTECTION

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

END OF SECTION 07 7200

This page intentionally left blank

SECTION 07 8400

FIRESTOPPING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Furnish all labor, materials, equipment, tools, and services required to fully complete all Firestopping work as is indicated on the drawings and/or specified herein including, but not limited to, the following described items.
B. Firestopping of joints and penetrations in fire-resistance-rated and smoke-resistant assemblies, whether indicated on drawings or not, and other openings indicated.
C. Do not include sales tax, refer to Section 00 1115 - Advertisement for Prequalification of Bidders.

1.02 RELATED REQUIREMENTS

A. Section 01 7700 - Closeout Procedures: Cutting and patching.
B. Section 07 8100 - Applied Fire Protection.
C. Section 09 2116 - Gypsum Board Assemblies: Gypsum wallboard fireproofing.
D. Division 23 - HVAC: Firestopping of mechanical work.
E. Division 26 - Electrical: Firestopping of electrical work.

1.03 REFERENCE STANDARDS

A. ASTM G21 - Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi; 2015, with Editorial Revision (2021).
B. ITS (DIR) - Directory of Listed Products; current edition.
C. FM 4991 - Firestop Contractors; 2013.
D. FM (AG) - FM Approval Guide; current edition.
E. UL (FRD) - Fire Resistance Directory; 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.
D. Manufacturer's Installation Instructions: Indicate preparation and installation instructions.
E. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
F. Certificate from authority having jurisdiction indicating approval of materials used.
G. Manufacturer's qualification statement.
H. Installer's qualification statement.

1.05 QUALITY ASSURANCE

A. The Work of this Section shall be accomplished by a single source contractor or by those contractors who, by their contract, are penetrating rated construction with their work. Regardless of responsibility, the General Contractor shall be responsible to assure and verify that all products, systems, etc. used under this Section are appropriate and meet the intent of this specification and is accomplished by factory trained workmen.
B. 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.

C. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years of documented experience.

D. Installer Qualifications: Company specializing in performing the work of this section and:
1. Trained by manufacturer.
2. Approved by Factory Mutual Research Corporation under FM 4991, or meeting any two of the following requirements:
3. Verification of minimum three years documented experience installing work of this type.
4. Verification of at least five satisfactorily completed projects of comparable size and type.
5. Licensed by local authorities having jurisdiction (AHJ).

1.06 MOCK-UPS

A. Install one firestopping assembly representative of each fire rating design required on project.
1. Where one design may be used for different penetrating items or in different wall constructions, install one assembly for each different combination.
2. Where firestopping is intended to fill a linear opening, install at least 1 linear foot of firestopping.

B. Obtain approval of authorities having jurisdiction (AHJ) before proceeding.

C. If accepted, mock-up will represent minimum standard for this work.

D. If accepted, mock-up may remain as part of this work. Remove and replace mock-ups not accepted.

1.07 FIELD CONDITIONS

A. Comply with firestopping manufacturer's recommendations for temperature and conditions during and after installation; maintain minimum temperature before, during, and for three days after installation of materials.

B. Provide ventilation in areas where solvent-cured materials are being installed.

1.08 GUARANTEE

A. The Contractor shall guarantee his work for a period of One (1) year from date of Substantial Completion. Guarantee shall be on form included in Section 01 7800.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Basis of Design Manufacturer:
1. Hilti, Inc: www.us.hilti.com.

B. Firestopping Manufacturers:
1. 3M Fire Protection Products: www.3m.com/firestop.
2. A/D Fire Protection Systems Inc: www.adfire.com.
3. Rectorseal, a CSW Industrials Company; Metacaulk 150+ General Purpose Firestop Sealant: www.metacaulk.com.
4. Nelson FireStop Products: www.nelsonfirestop.com.
5. Specified Technologies Inc: www.stifirestop.com.
6. Tremco Commercial Sealants & Waterproofing; TREMstop Acrylic: www.tremcosealants.com.

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.

2.03 FIRESTOPPING ASSEMBLY REQUIREMENTS

A. All UL Systems listed are based on one manufacturer's proprietary product as a basis of design. Other approved manufacturers may bid the project, and shall provide corresponding UL Systems for their individual products.
B. Refer to Drawings for required Fire Ratings and UL Systems.

2.04 FIRESTOPPING FOR PERIMETER CONTAINMENT

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.
C. Install backing materials to prevent liquid material from leakage.

3.03 INSTALLATION

A. Install materials in manner described in fire test report and in accordance with manufacturer's instructions, completely closing openings.
B. Do not cover installed firestopping until inspected by authorities having jurisdiction.
C. Install labeling required by code.

3.04 CLEANING

A. Clean adjacent surfaces of firestopping materials.

3.05 IDENTIFICATION

A. Wall Identification: Permanently label walls containing penetration firestopping systems with the words: 'FIRE AND/OR SMOKE BARRIER - PROTECT ALL OPENINGS' using lettering no less than 3 inches (76 mm) high and with minimum 0.375-inch (9.5-mm) strokes.
   1. Locate in accessible concealed floor, floor-ceiling, or attic space at 15 feet (4.57 m) from end of wall and at intervals not exceeding 30 feet (9.14 m).
B. Penetration Identification: Identify each penetration firestopping system with legible metal or plastic labels. Attach labels permanently to surfaces adjacent to and within 6 inches (150 mm) of penetration firestopping system edge so labels are visible to anyone seeking to remove penetrating items or firestopping systems. Use mechanical fasteners or self-adhering-type labels with adhesives capable of permanently bonding labels to surfaces on which labels are placed. Include the following information on labels:
   1. The words: 'Warning - Penetration Firestopping - Do Not Disturb. Notify Building Management of Any Damage.'

2. Contractor's name, address, and phone number.
3. Designation of applicable testing and inspecting agency.
4. Date of installation.
5. Manufacturer's name.
6. Installer's name.

3.06 PROTECTION

A. Protect adjacent surfaces from damage by material installation.

END OF SECTION 07 8400

SECTION 07 9200

JOINT SEALANTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Furnish all labor, materials, equipment, tools, and services required to fully complete all Joint Sealant work as is indicated on the drawings and/or specified herein including, but not limited to, the following described items.
   1. This section is intended to not only provide information for the caulking contractor, but also the contractors listed below, who are by this specification required to caulk their own work:
      a. Section 06 4100 - Architectural Casework
      b. Section 06 6116 - Solid Surfacing Fabrications
      c. Section 07 1300 - Sheet Waterproofing
      d. Section 07 2500 - Membrane Weather Barriers
      e. Section 07 4113 - Metal Roof and Soffit Panels
      f. Section 07 4213 - Concealed Fastener Metal Wall Panels
      g. Section 07 4243 - Composite Wall Panels
      h. Section 07 6200 - Sheet Metal Flashing and Trim
      i. Section 07 8400 - Firestopping
      j. Section 07 9513 - Expansion Joint Cover Assemblies
      k. Section 08 4313 - Aluminum-Framed Storefronts
      l. Section 08 4413 - Glazed Aluminum Curtain Wall
      m. Section 08 8100 - Glazed Wall System
      n. Section 08 8200 - Display Case Assemblies
      o. Section 09 3000 - Tiling
      p. Section 09 9113 - Exterior Painting
      q. Section 09 9123 - Interior Painting
      r. Section 11 4000 - Food Service Equipment
      s. Division 22 - Plumbing.
      t. If not listed above, the work will be caulked under this section.
B. Spray-applied joint sealants.
C. Non-sag gunnable joint sealants.
D. Self-leveling pourable joint sealants.
E. Silicone joint sealants.
F. Urethane joint sealants.
G. Latex joint sealants.
H. Joint backings and accessories.
I. Do not include sales tax, refer to 00 1115 - Advertisement for Prequalification of Bidders.

1.02 RELATED REQUIREMENTS

A. Section 07 1300 - Sheet Waterproofing: Sealing cracks and joints in waterproofing substrate surfaces using materials specified in this section.
B. Section 07 2500 - Membrane Weather Barriers: Sealants required in conjunction with water-resistive barriers.
C. Section 07 8400 - Firestopping: Firestopping sealants.
D. Section 07 9513 - Expansion Joint Cover Assemblies: Sealants forming part of expansion joint cover assemblies.

E. Section 08 7100 - Door Hardware: Setting exterior door thresholds in sealant.
F. Section 08 8000 - Glazing: Glazing sealants and accessories.
G. Section 09 2116 - Gypsum Board Assemblies: Sealing acoustical and sound-rated walls and ceilings.
H. Section 09 3000 - Tiling: Sealant between tile and plumbing fixtures and at junctions with other materials and changes in plane.

1.03 REFERENCE STANDARDS

A. ASTM C661 - Standard Test Method for Indentation Hardness of Elastomeric-Type Sealants by Means of a Durometer; 2015 (Reapproved 2022).
B. ASTM C919 - Standard Practice for Use of Sealants in Acoustical Applications; 2022.
C. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2018.
D. ASTM C1193 - Standard Guide for Use of Joint Sealants; 2016.
E. ASTM C1330 - Standard Specification for Cylindrical Sealant Backing for Use with Cold Liquid-Applied Sealants; 2018.
F. ASTM C1521 - Standard Practice for Evaluating Adhesion of Installed Weatherproofing Sealant Joints; 2019 (Reapproved 2020).
G. ASTM D4541 - Standard Test Method for Pull-Off Strength of Coatings Using Portable Adhesion Testers; 2017.
H. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2021a.

1.04 DEFINITIONS

A. Sealant Types and Classifications:
    1. Type:
        a. Type S: Single-component sealant.
        b. Type M: Multi-component sealant.
    2. Grade:
        a. Grade P: Pourable or self-leveling sealant used for horizontal traffic joints.
        b. Grade NS: Non-sag or gunnable sealant used for vertical and non-traffic joints.
    3. Classes: Represent movement capability in percent of joint width.
        a. Class 100/50: Sealant that, when tested for adhesion or cohesion under cyclic movement shall withstand of at least 100 percent increase and decrease of at least 50 percent of joint width as measured at time of application.
        b. Class 50: Sealant that, when tested for adhesion or cohesion under cyclic movement shall withstand increase and decrease of at least 50 percent of joint width as measured at time of application.
        c. Class 25: Sealant that, when tested for adhesion or cohesion under cyclic movement shall withstand increase and decrease of at least 25 percent of joint width as measured at time of application.
        d. Class 12: Sealant that, when tested for adhesion and cohesion under cyclic movement shall withstand increase and decrease of at least 12 percent of joint width as measured at time of application.
    4. Use:
        a. T (Traffic): Sealant designed for use in joints in pedestrian and vehicular traffic areas such as walkways, plazas, decks and parking garages.
        b. NT (Non-Traffic): Sealant designed for use in joints in non-traffic areas.
        c. I (Immersion): Sealant that meets bond requirements when tested by immersion (Immersion rated sealant applications require primer).
        d. M (Mortar): Sealant that meets bond requirements when tested on mortar specimens.

e. G (Glass): Sealant that meets bond requirements when tested on glass specimens.
f. A (Aluminum): Sealant that meets bond requirements when tested on aluminum specimens.
g. O (Other): Sealant that meets bond requirements when tested on substrates other than standard substrates, being glass, aluminum, mortar.

B. Silicone: Any member of family of polymeric products whose molecular backbone is made up of alternating silicon and oxygen atoms and which has pendant hydrocarbon groups attached to silicon atoms. Used primarily as a sealant. Offers excellent resistance to water and large variations in temperature (minus 100 degrees F to plus 600 degrees F) (minus 73.3 degrees C to plus 316 degrees C).

1.05 ADMINISTRATIVE REQUIREMENTS

A. Coordinate the work with other sections referencing this section.

1.06 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 that product is known to satisfactorily adhere to and with which it is compatible.
   4. Substrates the product should not be used on.
   5. Substrates for which use of primer is required.
   6. Substrates for which laboratory adhesion and/or compatibility testing is required.
   7. Installation instructions, including precautions, limitations, and recommended backing materials and tools.
   8. Sample product warranty.
   9. Certification by manufacturer indicating that product complies with specification requirements.
C. Product Data for Accessory Products: Submit manufacturer's technical data sheet for each product to be used, including physical characteristics, installation instructions, and recommended tools.
D. Manufacturer's Installation Instructions: Indicate special procedures, surface preparation, and perimeter conditions requiring special attention.
E. Color Cards for Selection: Where sealant color is not specified, submit manufacturer's color cards showing standard colors available for selection.
F. Samples for Verification: Where custom sealant color is specified, obtain directions from Architect and submit at least two physical samples for verification of color of each required sealant.

1.07 QUALITY ASSURANCE

A. Maintain one copy of each referenced document covering installation requirements on site.
B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years of documented experience.
C. Installer Qualifications: Company specializing in performing the work of this section and with at least three years of documented experience.
D. Field Adhesion Tests of Joints: Test for adhesion using most appropriate method in accordance with ASTM C1521, or other applicable method as recommended by manufacturer.

1.08 MOCK-UP

A. Provide mock-up of sealant joints in conjunction with window and wall under provisions of Section 01 4000.
B. Construct mock-up with specified sealant types and with other components noted.
C. Locate where directed.
D. Mock-up may remain as part of the Work.

1.09 FIELD CONDITIONS

A. Maintain temperature and humidity recommended by the sealant manufacturer during and after installation.

1.10 WARRANTY

A. See Section 01 7800 - Closeout Submittals for additional warranty requirements.
B. Correct defective work within a One (1) year period after Date of Substantial Completion.
C. Warranty: Include coverage for installed sealants and accessories which fail to achieve airtight seal and watertight seal, exhibit loss of adhesion or cohesion, or do not cure.
D. The Contractor shall guarantee his work for a period of One (1) year from date of Substantial Completion. Guarantee shall be on form included in Section 01 7800.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Spray-Applied Sealants:
   1. CertainTeed Corporation; _____: www.certainteed.com.
B. Nonsag Sealants (Grade - NS): Permits application in joints on vertical surfaces without sagging or slumping.
   1. Dow Corning Corporation: www.dowcorning.com/construction.
   2. Pecora Corporation: www.pecora.com.
   3. Sherwin-Williams Company: www.sherwin-williams.com.
   4. Sika Corporation: www.usa-sika.com.
   5. Tremco Commercial Sealants and Waterproofing: www.tremcosealants.com.
   6. Substitutions: See Section 01 6000 - Product Requirements.
C. Self-leveling Sealants (Grade - P): Pourable or self-leveling sealant that has sufficient flow to form a smooth, level surface when applied in a horizontal joint.
   1. Dow Corning Corporation: www.dowcorning.com/construction.
   2. Pecora Corporation: www.pecora.com.
   3. Sherwin-Williams Company: www.sherwin-williams.com.
   4. Sika Corporation: www.usa-sika.com.
   5. Tremco Commercial Sealants and Waterproofing: www.tremcosealants.com.
   6. Substitutions: See Section 01 6000 - Product Requirements.

2.02 JOINT SEALANT APPLICATIONS

A. Scope:
B. Interior Wet Areas: Bathrooms, restrooms, kitchens, food service areas, and food processing areas; fixtures in wet areas include plumbing fixtures, food service equipment, countertops, cabinets, and other similar items.
C. Sound-Rated Assemblies: Walls and ceilings identified as 'STC-rated', 'sound-rated', or 'acoustical', and any interior wall with insulation.

2.03 SPRAY-APPLIED JOINT SEALANTS

A. Spray-Applied Water-Based Acrylic Latex Sealant: For interior applications, use spray-applied, fast-drying, premixed acrylic latex sealant, intended for air sealing penetrations and joints.
   1. Surface Burning Characteristics: Smoke developed index of 450 or less, and flame spread index of 25 or less, Class A, when tested in accordance with ASTM E84.
   2. Spray Equipment: Use rate of application and methods as recommended by manufacturer.
   3. Wood Adhesion: Passes ASTM D4541, without pulling back, shrinking, or cracking.
   4. Color: Blue.
   5. Manufacturers:
      a. CertainTeed Corporation; CertaSeal INT: www.certainteed.com.
      b. Substitutions: See Section 01 6000 - Product Requirements.

2.04 SELF- LEVELING SEALANTS

A. Type[6]- Self-Leveling Polyurethane Sealant (paintable): ASTM C920, Grade P, Uses: T, M, NT, G, O, A, and I; Type: multi-component explicitly approved by manufacturer for traffic exposure; and continous water immersion.
   1. Applications: Use for:
      a. Control and Expansion Joints in sidewalks and vehicular paving.
   2. Hardness Range: 35 to 55, Shore A, when tested in accordance with ASTM C661.
   3. Color: To be selected by Architect from manufacturer's standard range.
   4. Service Temperature Range: Minus 40 to 180 degrees F.
   5. Manufacturers:
      a. Sika Corporation; Sikaflex-2c SL: www.usa.sika.com.
      b. Substitutions: See Section 01 6000 - Product Requirements.

2.05 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 Not Subject to Pedestrian or Vehicular Traffic: ASTM C1330; Type O - Open Cell Polyurethane.
   2. Closed Cell and Bi-Cellular: 25 to 33 percent larger in diameter than joint width.
B. Backing Tape: Self-adhesive polyethylene tape with surface that sealant will not adhere to and recommended by tape and sealant manufacturers for specific application.
C. Joint Cleaner: Non-corrosive and non-staining type, type recommended by sealant manufacturer; compatible with joint forming materials.
D. 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.
   1. Examine substrate(s) with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint-sealant performance.
   2. Installer to proceed with installation only after unsatisfactory conditions have been corrected and/or that installation of sealant constitutes acceptance from the installer of acceptable substrate conditions.
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:
    1. Width/depth ratio of 2:1.
    2. Neck dimension no greater than 1/3 of the joint width.
    3. Surface bond area on each side not less than 75 percent of joint width.
E. Install bond breaker backing tape where backer rod cannot be used.
F. Install sealant free of air pockets, foreign embedded matter, ridges, and sags, and without getting sealant on adjacent surfaces.
G. Do not install sealant when ambient temperature is outside manufacturer's recommended temperature range, or will be outside that range during the entire curing period, unless manufacturer's approval is obtained and instructions are followed.
H. Nonsag Sealants: Tool surface concave, unless otherwise indicated; remove masking tape immediately after tooling sealant surface.

3.04 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 07 9200

SECTION 07 9513

EXPANSION JOINT COVER ASSEMBLIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Furnish all labor, materials, equipment, tools, and services required to fully complete all Expansion Joint Cover Assembly work as is indicated on the drawings and/or specified herein including, but not limited to, the following described items.
B. Expansion joint assemblies for interior floor, wall, and ceiling surfaces.
C. Expansion joint assemblies for exterior wall surfaces.
D. Do not include sales tax, refer to Section 00 1115 - Advertisement for Prequalification of Bidders.

1.02 RELATED REQUIREMENTS

A. Section 03 1000 - Concrete Forming and Accessories: Placement of joint cover assembly frames in formwork.
B. Section 04 2731 - Engineered Unit Masonry: Placement of joint cover assembly frames in masonry.
C. Section 07 6200 - Sheet Metal Flashing and Trim: Custom fabricated control and expansion joint devices.
D. Section 09 2116 - Gypsum Board Assemblies: Placement of expansion joint assemblies in gypsum board walls and ceilings.

1.03 REFERENCE STANDARDS

A. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2014.
B. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2021.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Installation Templates: For frames and anchors to be embedded in concrete or masonry, furnish templates to relevant installers; include installation instructions and tolerances.

1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide joint assembly profiles, profile dimensions, anchorage devices and available colors and finish.
C. Shop Drawings: Indicate joint and splice locations, miters, layout of the work.
D. Samples: Submit two samples 12 inches long, illustrating profile, dimension, color, and finish selected.
E. Manufacturer's Installation Instructions: Indicate rough-in sizes and required tolerances for item placement.

1.06 GUARANTEE

A. The Contractor shall guarantee his work for a period of One (1) year from date of Substantial Completion. Guarantee shall be on form included in Section 01 7800.
B. Manufacturer's warranty against material and manufacturing defects for a period of no less than 3 years when installed in accordance with manufacturer’s recommendations.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Expansion Joint Cover Assemblies:
   1. Architectural Art Mfg., Inc: www.archart.com.
   2. BASF Watson Bowman Acme Corporation: www.wbacorp.com.
   3. Construction Specialties, Inc: www.c-sgroup.com.
   4. EMSEAL Joint Systems, Ltd: www.emseal.com.
   5. Inpro: www.inprocorp.com.
   6. MM Systems Corp: www.mmsystemscorp.com.
   7. Nystrom, Inc: www.nystrom.com.
   8. Balco, Inc.: www.balcousa.com.
   9. Substitutions: See Section 01 6000 - Product Requirements See Section 01 6000 - Product Requirements.

2.02 INTERIOR EXPANSION JOINT COVER ASSEMBLY

A. Refer to drawings for types and locations .
B. Type 1 - Interior Flush-Mounted Floor-Floor Assembly:
   1. Cover: Directional textured aluminum.
   2. Base: Mill finish aluminum.
   3. Movement: 100 percent.
   4. Acceptable Product: HDNB-2 manufactured by Balco, Inc.
C. Type 2 - Interior Flush-Mounted Floor-Wall Assembly:
   1. Cover: Directional textured aluminum.
   2. Base: Mill finish aluminum.
   3. Movement: 50 percent.
   4. Acceptable Product: HDNBL-2 manufactured by Balco, Inc.
D. Type 3 - Interior Snap-on Wall-to-Wall or Ceiling-to-Ceiling Assembly:
   1. Cover: Clear anodized aluminum.
   2. Movement: 50 percent.
   3. Base: Mill finish aluminum.
   4. Acceptable Product: 2HWD-2 manufactured by Balco, Inc.
E. Type 4 - Interior Flush-Mounted Wall-to-Wall Assembly:
   1. Color: Silicone Colors, Choose from Dow 790 Color Chart.
   2. Colors subjected to 100 foot order minimum.
   3. Movement: 50 percent.
   4. Acceptable Product: IS-2 manufactured by Balco, Inc.

2.03 EXTERIOR EXPANSION JOINT COVER ASSEMBLIES

A. Refer to drawings for types and locations.
B. Type 1 - Exterior Pre-Compressed Wall-Wall Assembly:
   1. Color: Colorized silicone facing, color by architect from manufacturer's full lie.
   2. Movement: +/- 50 percent.
   3. Acceptable Product: BCSW-200 manufactured by Balco, Inc.

2.04 EXPANSION JOINT COVER ASSEMBLIES

A. Expansion Joint Cover Assemblies - General: Factory-fabricated and assembled, designed to completely fill joint openings, sealed to prevent passage of air, dust, water, smoke; suitable for traffic expected.
   1. Joint Dimensions and Configurations: As indicated on drawings.

2. Joint Cover Sizes: Selected to suit joint width and configuration, based on manufacturer's published recommendations and limitations.
3. Joint Cover Styles: As indicated above and on drawings.
4. Lengths: Provide covers in full lengths required; avoid splicing wherever possible.
5. Anchors, Fasteners, and Fittings: Provided by cover manufacturer.

B. Floor Joint Covers: Coordinate with indicated floor coverings.
1. If floor covering is not indicated, obtain instructions from Architect before proceeding.

2.05 MATERIALS

A. Extruded Aluminum:, 6063 alloy, T6 temper and T5 temper.
1. Extruded Aluminum:
a. ASTM B221, alloy 6063-T5 for extrusions.
b. ASTM B209, alloy 6061-T6 for plate.
c. ASTM B209, alloy 5052-H32 for sheet.
d. Exposed Finish Outdoors: Natural anodized.
e. Exposed Finish at Floors: Mill finish.
f. Exposed Finish at Walls and Ceilings: Natural anodized.

B. Resilient Seals:
1. Santoprene; no PVC; Shore A hardness of 40 to 50 Durometer.
2. Color: Custom colors as selected by Architect..

C. Fasteners and Accessories: As recommended by cover manufacturer for a complete installation.
D. Ferrous Metal Anchors: Galvanized where embedded in concrete or in contact with cementitious materials.
E. Threaded Fasteners: As recommended by manufacturer.
F. Backing Paint for Aluminum Components in Contact with Cementitious Materials: Asphaltic type.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that joint preparation and dimensions are acceptable and in accordance with manufacturer's requirements.

3.02 INSTALLATION

A. Install components and accessories in accordance with manufacturer's instructions.
B. Align work plumb and level, flush with adjacent surfaces.
C. Rigidly anchor to substrate to prevent misalignment.

3.03 PROTECTION

A. Protect installation from damage by work of others.
B. At completion of the installation, clean exposed surfaces with non-solvent cleaner.
C. Do not permit traffic over unprotected floor joint surfaces.
D. Provide reinforced cloth tape to protect finish surface.

END OF SECTION 07 9513

This page intentionally left blank

SECTION 08 1113

HOLLOW METAL DOORS AND FRAMES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Furnish all labor, materials, equipment, tools and services required to fully complete all Hollow Metal Door and Frame work as is indicated on the drawings and/or specified herein including, but not limited to, the following described items.
B. Non-fire-rated hollow metal doors and frames.
C. Non-fire rated hollow metall frames for wood doors.
D. Fire-rated hollow metal doors and frames.
E. Fire-rated hollow metal frames for wood doors.
F. Thermally insulated hollow metal doors with frames.
G. Hollow metal borrowed lites glazing frames.
H. Accessories, including glazing, and matching panels.
I. Do not include sales tax, refer to Section 00 1115 - Advertisement for Prequalification of Bidders.

1.02 RELATED REQUIREMENTS

A. Section 08 1416 - Flush Wood Doors.
B. Section 08 7100 - Door Hardware.
C. Section 08 8000 - Glazing: Glass for doors and borrowed lites.
D. Section 09 9113 - Exterior Painting: Field painting.
E. Section 09 9123 - Interior Painting: Field painting.

1.03 ABBREVIATIONS AND ACRONYMS

A. ANSI - American National Standards Institute.
B. ASCE - American Society of Civil Engineers.
C. HMMA - Hollow Metal Manufacturers Association.
D. NAAMM - National Association of Architectural Metal Manufacturers.
E. NFPA - National Fire Protection Association.
F. SDI - Steel Door Institute.
G. UL - Underwriters Laboratories.

1.04 REFERENCE STANDARDS

A. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design; 2010.
B. ANSI/SDI A250.4 - Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors, Frames and Frame Anchors; 2018.
C. ANSI/SDI A250.8 - Specifications for Standard Steel Doors and Frames (SDI-100); 2017.
D. ANSI/SDI A250.10 - Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames; 2020.
E. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2020.
F. BHMA A156.115 - Hardware Preparation In Steel Doors And Steel Frames; 2016.
G. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2017.
H. ITS (DIR) - Directory of Listed Products; current edition.
I. NAAMM HMMA 830 - Hardware Selection for Hollow Metal Doors and Frames; 2002.
J. NAAMM HMMA 831 - Hardware Locations for Hollow Metal Doors and Frames; 2011.

K. NAAMM HMMA 840 - Guide Specifications For Receipt, Storage and Installation of Hollow Metal Doors and Frames; 2017.
L. NAAMM HMMA 861 - Guide Specifications for Commercial Hollow Metal Doors and Frames; 2014.
M. NFPA 80 - Standard for Fire Doors and Other Opening Protectives; 2022.
N. SDI 117 - Manufacturing Tolerances for Standard Steel Doors and Frames; 2019.
O. UL (DIR) - Online Certifications Directory; Current Edition.

1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Product Data: Materials and details of design and construction, hardware locations, reinforcement type and locations, anchorage and fastening methods, and finishes; and one copy of referenced standards/guidelines.
C. Shop Drawings: Details of each opening, showing elevations, glazing, frame profiles, and any indicated finish requirements.
D. Samples: Submit two samples of metal, 2 inch by 2 inch in size showing factory finishes, colors, and surface texture.
E. Installation Instructions: Manufacturer's published instructions, including any special installation instructions relating to this project.
F. Manufacturer's Certificate: Certification that products meet or exceed specified requirements.

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.

1.08 GUARANTEE

A. The Contractor shall guarantee his work for a period of One (1) year from date of Substantial Completion. Guarantee shall be on form included in Section 01 7800.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Hollow Metal Doors and Frames:
    1. Ceco Door, an Assa Abloy Group company: www.assaabloydss.com.
    2. Curries, an Assa Abloy Group company: www.assaabloydss.com.
    3. De La Fontaine Inc; Hollow Metal Door Model : www.delafontaine.com
    4. Republic Doors, an Allegion brand: www.republicdoor.com
    5. Steelcraft, an Allegion brand: www.allegion.com
    6. Substitutions: See Section 01 6000 - Product Requirements.

2.02 DESIGN CRITERIA

A. Requirements for Hollow Metal Doors and Frames:

1. Steel used for fabrication of doors and frames shall comply with one or more of the following requirements; Galvannealed steel conforming to ASTM A653/A653M, cold-rolled steel conforming to ASTM A1008/A1008M, or hot-rolled pickled and oiled (HRPO) steel conforming to ASTM A1011/A1011M, Commercial Steel (CS) Type B for each.
2. Accessibility: Comply with ICC A117.1 and ADA Standards.
3. Exterior Door Top Closures: Flush end closure channel, with top and door faces aligned.
4. Door Edge Profile: Manufacturers standard for application indicated.
5. Typical Door Face Sheets: Flush.
6. Glazed Lights: Non-removable stops on non-secure side; sizes and configurations as indicated on drawings. Style: Manufacturers standard.
7. Hardware Preparations, Selections and Locations: Comply with NAAMM HMMA 830 and NAAMM HMMA 831 or BHMA A156.115 and ANSI/SDI A250.8 (SDI-100) in accordance with specified requirements.
8. Zinc Coating for Typical Interior and/or Exterior Locations: Provide metal components zinc-coated (galvanized) and/or zinc-iron alloy-coated (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.

B. Hollow Metal Panels: Same construction, performance, and finish as doors.

C. Combined Requirements: If a particular door and frame unit is indicated to comply with more than one type of requirement, comply with the specified requirements for each type; for instance, an exterior door that is also indicated as being sound-rated must comply with the requirements specified for exterior doors and for sound-rated doors; where two requirements conflict, comply with the most stringent.

2.03 HOLLOW METAL DOORS

A. Door Finish: Factory primed and field finished.

B. Exterior Doors: Thermally insulated.
   1. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).
      a. Level 4 - Maximum-duty.
      b. Physical Performance Level A 1 000 000 cycles; in accordance with ANSI/SDI A250.4.
      c. Model 1 - Full Flush.
      d. Door Face Metal Thickness: 14 gage, 0.067 inch, minimum.
      e. Zinc Coating: A60/ZF180 galvannealed coating; ASTM A653/A653M.
   2. Door Core Material: Manufacturers standard core material/construction and in compliance with requirements.
   3. Door Thickness: 1-3/4 inch, nominal.
   4. Weatherstripping: Refer to Section 08 7100.

C. Interior Doors, Non-Fire Rated:
   1. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).
      a. Level 3 - Extra Heavy-duty.
      b. Physical Performance Level C, 250,000 cycles; in accordance with ANSI/SDI A250.4.
      c. Model 1 - Full Flush.
      d. Door Face Metal Thickness: 20 gage, 0.032 inch, minimum.
   2. Door Core Material: Manufacturers standard core material/construction and in compliance with requirements.
   3. Door Thickness: 1-3/4 inch, nominal.

D. Fire-Rated Doors:
   1. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).
      a. Level 3 - Extra Heavy-duty.

b. Physical Performance Level A 1 000 000 cycles; in accordance with ANSI/SDI A250.4.
c. Model 1 - Full Flush.
d. Door Face Metal Thickness: 20 gage, 0.032 inch, minimum.

2. Fire Rating: As indicated on Door and Frame Schedule, tested in accordance with UL 10C ("positive pressure").
   a. Temperature-Rise Rating (TRR) Across Door Thickness: In accordance with local building code and authorities having jurisdiction.
   b. Provide units listed and labeled by UL (DIR) or ITS (DIR).
   c. Attach fire rating label to each fire rated unit.
3. Door Core Material: Manufacturers standard core material/construction in compliance with requirements.
4. Door Thickness: 1-3/4 inch, nominal.

2.04 HOLLOW METAL FRAMES

A. Comply with standards and/or custom guidelines as indicated for corresponding door in accordance with applicable door frame requirements.
B. Frame Finish: Same as hollow metal door.
C. General:
   1. Comply with the requirements of grade specified for corresponding door.
      a. ANSI/SDI A250.8 Level 3 Doors: 14 gage, 0.067 inch, minimum frames.
      b. ANSI/SDI A250.8 Level 4 Doors: 12 gage, 0.093, minimum frames.
      c. Frames for Wood Doors: 14 gage, 0.067 inch, minimum.
   2. Provide frames with a minimum of six wall anchors and two adjustable base anchors of manufacturer’s standard design.
D. 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 A60/ZF180 coating.
   2. Weatherstripping: Separate, see Section 08 7100.
E. Interior Door Frames, Non-Fire-Rated: Fully welded type, seamless with joints filled.
F. Interior Door Frames, Fire-Rated: Fully welded type, seamless with joints filled.
   1. Fire Rating: Same as door, labeled.
G. Sound-Rated Door Frames: Fully welded type, seamless with joints filled.
H. Mullions for Pairs of Doors: Fixed, with profile similar to jambs.
I. Borrowed Lites Glazing Frames: Construction and face dimensions to match door frames, and as indicated on drawings.

2.05 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.
   1. Coat inside of frames to be installed in masonry or to be grouted, with bituminous coating, prior to installation.

2.06 ACCESSORIES

A. Louvers: Roll formed steel with overlapping frame; finish same as door components ; factory-installed.
   1. In Fire-Rated Doors: UL (DIR) or ITS (DIR) listed fusible link louver, same rating as door.
B. Glazing: As specified in Section 08 8000, factory installed.
C. Removable Stops: Formed sheet steel, shape as indicated on drawings, mitered or butted corners; prepared for countersink style tamper proof screws.

D. Astragals for Double Doors: Specified in Section 08 7100.
E. Grout for Frames: Portland cement grout with maximum 4 inch slump for hand troweling; thinner pumpable grout is prohibited.
F. 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.
G. 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.
    1. Epoxy paint or self adhered waterproof membrane may also be used.

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. Install fire rated units in accordance with NFPA 80.
C. Coordinate frame anchor placement with wall construction.
D. Grout frames in masonry construction, using hand trowel methods; brace frames so that pressure of grout before setting will not deform frames.
E. Door Hardware: Provide hardware and installation for work associated with this section as scheduled by Section 08 7100.
F. Comply with glazing installation requirements of Section 08 8000.
G. Coordinate installation of electrical connections to electrical hardware items.
H. Touch up damaged factory finishes.

3.04 TOLERANCES

A. Clearances Between Door and Frame: Comply with related requirements of specified frame standards or custom guidelines indicated in accordance with SDI 117 or NAAMM HMMA 861.
B. Maximum Diagonal Distortion: 1/16 inch measured with straight edge, corner to corner.

3.05 ADJUSTING

A. Adjust for smooth and balanced door movement.
B. Test sound control doors for force to close, latch, and unlatch; adjust as necessary in compliance with requirements.

3.06 SCHEDULE

A. Refer to Door Schedule on the drawings.

END OF SECTION 08 1113

This page intentionally left blank

SECTION 08 1416

FLUSH WOOD DOORS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Furnish all labor, materials, equipment, tools, and services required to fully complete all Flush Wood Door work as is indicated on the drawings and/or specified herein including, but not limited to, the following described items.
B. Flush wood doors; flush and flush glazed configuration; fire rated, non-rated, acoustical, and special function.
   1. Sound-rated doors to be provided at Music Practice Rooms as noted on Drawings.
C. Door hardware.
   1. Provide hardware and installation for work associated with this section as scheduled by Section 08 7100.
D. Do not include sales tax, refer to Section 00 1115 - Advertisement for Prequalification of Bidders.

1.02 RELATED REQUIREMENTS

A. Section 08 1113 - Hollow Metal Doors and Frames.
B. Section 08 7100 - Door Hardware.
C. Section 08 8000 - Glazing

1.03 REFERENCE STANDARDS

A. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements; 2009 (Reapproved 2016).
B. ASTM E413 - Classification for Rating Sound Insulation; 2016.
C. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards, 2nd Edition; 2014, with Errata (2016).
D. AWMAC/WI (NAAWS) - North American Architectural Woodwork Standards; 2021, with Errata.
E. NFPA 80 - Standard for Fire Doors and Other Opening Protectives; 2022.
F. UL 10C - Standard for Positive Pressure Fire Tests of Door Assemblies; Current Edition, Including All Revisions.
G. WDMA I.S. 1A - Interior Architectural Wood Flush Doors; 2013.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.
B. Product Data: Indicate door core materials and construction, veneer species, type, and characteristics.
C. Shop Drawings: Show doors and frames, elevations, sizes, types, swings, undercuts, beveling, blocking for hardware, factory machining, factory finishing, cutouts for glazing and other details.
   1. Provide information as required by AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS).
D. Samples: Submit two samples of door construction, 8 inches by 8 inches in size cut from top corner of door.
E. Samples: Submit two samples of door veneer, 8 inches by 8 inches in size illustrating wood grain, stain color, and sheen.
F. Certificate: Submit labels and certificates required by quality assurance and quality control programs.
G. Test Reports: Show compliance with specified requirements for the following:

1. Sound-rated doors and frames; sealed panel tests are not acceptable.

H. Samples: Submit two samples of edgebanding, 6 inches (150 mm) in length illustrating color and pattern.
I. Manufacturer's Installation Instructions: Indicate special installation instructions.
J. Manufacturer's qualification statement.
K. Specimen warranty.
L. Warranty, executed in Murray City School District 's name.

1.05 QUALITY ASSURANCE

A. Maintain one copy of the specified door quality standard on site for review during installation and finishing.
B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section, with no less than three years of documented experience.
   1. Company with at least one project within past five years with value of woodwork within at least 20 percent of cost of woodwork for this project.
   2. Accredited participant in the specified certification program prior to the commencement of fabrication and throughout the duration of the project.
C. Installer Qualifications: Company specializing in performing work of the type specified in this section, with no less than three years of documented experience.
D. Woodwork Quality Assurance Program:
   1. Comply with AWI (QCP) woodwork association quality certification service/program in accordance with requirements for work specified in this section.
   2. Provide labels indicating that the installed work complies with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS) requirements for grade or grades specified.
   3. Provide designated labels on shop drawings as required by quality assurance program.
   4. Provide designated labels on installed products as required by quality assurance program.
   5. Submit documentation upon completion of installation that verifies this work is in compliance with specified requirements.
E. Single-Source Responsibility: Obtain doors from one source and by a single manufacturer.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Package, deliver, and store doors in accordance with specified quality standard.
B. Accept doors on site in manufacturer's packaging, and inspect for damage.
C. Protect doors with resilient packaging sealed with heat shrunk plastic; do not store in damp or wet areas or areas where sunlight might bleach veneer; seal top and bottom edges with tinted sealer if stored more than one week, and break seal on site to permit ventilation.
D. Contractor shall use all means necessary to protect doors from damage prior to, during, and after installation. All damaged doors shall be repaired or replaced by the Contractor at no cost to the Owner.
E. Doors shall be palletized at factory in stack of no more than 30 doors per pallet. Door edges shall be protected with heavy corner guards.

1.07 PROJECT CONDITIONS

A. Conditioning: Do not deliver or install doors until conditions for temperature and relative humidity have been stabilized and will be maintained in storage and installation areas during the remainder of the construction period to comply with the following requirements applicable to Project’s geographical location:
   1. AWS quality standard Section 2 Care and Storage.

1.08 WARRANTY

A. See Section 01 7800 - Closeout Submittals for additional warranty requirements.
B. Interior Doors: Provide manufacturer's warranty for the life of the installation.
C. Include coverage for delamination of veneer, warping beyond specified installation tolerances, defective materials, and telegraphing core construction.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Basis of Design Manufacturer:
   1. Masonite Architectural. Product: Marshfield-Algoma-Aspiro Series. www.masonite.com.
B. Other Approved Manufacturers:
   1. VT Industries, Inc: www.vtindustries.com
   2. Substitutions: See Section 01 6000 - Product Requirements.

2.02 DOORS AND PANELS

A. Doors: See drawings for locations and additional requirements.
   1. Quality Standard: Custom Grade, Heavy Duty performance, in accordance with AWI/AWMAC/WI (AWS), AWMAC/WI (NAAWS) or WDMA I.S. 1A.
   2. Wood Veneer-Faced Doors: 5-ply unless otherwise indicated.
B. Interior Doors: 1-3/4 inches thick unless otherwise indicated; flush construction.
   1. Provide solid core doors at each location.
   2. Fire Rated Doors: Tested to ratings indicated on drawings in accordance with UL 10C - Positive Pressure; Underwriters Laboratories Inc (UL) or Intertek/Warnock Hersey (WHI) labeled without any visible seals when door is open.
   3. Sound Rated Doors: Minimum STC of 45, calculated in accordance with ASTM E413, tested in accordance with ASTM E90.
   4. Wood veneer facing with factory transparent finish as selected by architect.

2.03 DOOR AND PANEL CORES

A. Non-Rated Solid Core and 20 Minute Rated Doors: Type particleboard core (PC), plies and faces as indicated.
B. Fire-Rated Doors: Mineral core type, with fire resistant composite core (FD), plies and faces as indicated above; with core blocking as required to provide adequate anchorage of hardware without through-bolting.
C. Sound-Rated Doors: Equivalent to type, with acoustic core construction as required to achieve STC rating specified; plies and faces as indicated above.

2.04 DOOR FACINGS

A. Veneer Facing for Transparent Finish: Select White Maple, Premium HPVA Grade A, plain sliced (flat cut), with book match between leaves of veneer, center balance match of spliced veneer leaves assembled on door or panel face.
   1. Veneers shall be 5 inches minimum width.
   2. Vertical Edges: 1/8 inch (3 mm) PVC wood grain edgebanding to match wood veneer. Edgebanding selection to be approved by Architect.
      a. PVC on both vertical edges.
   3. Pair Match each pair of doors; Set Match pairs of doors within 10 feet of each other when doors are closed.
B. Facing Adhesive: Type I - waterproof.

2.05 DOOR CONSTRUCTION

A. Fabricate doors in accordance with door quality standard specified.
B. Cores Constructed with stiles and rails:
   1. Provide solid blocks at lock edge and top of door for closer for hardware reinforcement.
   2. Provide solid blocking for other throughbolted hardware.
C. Where supplementary protective edge trim is required, install trim after veneer facing has been applied full-width.
D. Glazed Openings: Non-removable stops on non-secure side; sizes and configurations as indicated on drawings.
E. Factory machine doors for hardware other than surface-mounted hardware, in accordance with hardware requirements and dimensions.
F. Factory fit doors for frame opening dimensions identified on shop drawings, with edge clearances in accordance with specified quality standard.
G. Provide edge clearances in accordance with the quality standard specified.

2.06 FINISHES - WOOD VENEER DOORS

A. Finish work in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), Section 5 - Finishing for grade specified and as follows:
   1. Transparent:
      a. System - 11 Polyurethane Catalyzed.
         1) AWI Section 1500, System TR-6 may also be used.
      b. Stain: Custom color as selected/approved by Architect.
      c. Sheen: Satin.
B. Finish work in accordance with WDMA I.S. 1A for grade specified and as follows:
C. Factory finish doors in accordance with approved sample.
D. Seal door top edge with color sealer to match door facing.

2.07 ACCESSORIES

A. Hollow Metal Door Frames: See Section 08 1113.
B. Glazing: See Section 08 8000.
C. Glazing Stops: Wood, of same species as door facing, butted corners; prepared for countersink style tamper proof screws.
   1. Non-Rated and 20 Minute: Flush, wood of same species as door facing.
      a. Acceptable Profile: Marshfield Type W-6.
   2. Fire-Rated 45 Minute or Above: Flush, wood veneer clad PVC, of same species as door facing.
D. Astragals for Fire-Rated Double Doors: Steel, T shaped, overlapping and recessed at face edge, specifically for double doors.
E. Door Hardware: Provide hardware and installation for work associated with this section as scheduled by Section 08 7100.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.
B. Verify that opening sizes and tolerances are acceptable.
C. Do not install doors in frame openings that are not plumb or are out-of-tolerance for size or alignment.

3.02 INSTALLATION

A. Install doors in accordance with manufacturer's instructions and specified quality standard.
   1. Install fire-rated doors in accordance with NFPA 80 requirements.
B. Factory-Finished Doors: Do not field cut or trim; if fit or clearance is not correct, replace door.
C. Use machine tools to cut or drill for hardware.
D. Coordinate installation of doors with installation of frames and hardware.
E. Coordinate installation of glazing.

3.03 TOLERANCES

A. Comply with specified quality standard for fit and clearance tolerances.
B. Comply with specified quality standard for telegraphing, warp, and squareness.

3.04 ADJUSTING

A. Adjust doors for smooth and balanced door movement.
B. Adjust closers for full closure.

3.05 SCHEDULE- SEE DRAWINGS

END OF SECTION 08 1416

This page intentionally left blank

SECTION 08 3100

ACCESS DOORS AND PANELS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Furnish all labor, materials, equipment, tools and services required to fully complete all Access Door and Panel work as is indicated on the drawings and/or specified herein including, but not limited to, the following described items.
B. Wall access door and frame units.
C. Ceiling access door and frame units.
D. Do not include sales tax, refer to Section 00 1115 - Advertisement for Prequalification of Bidders.

1.02 RELATED REQUIREMENTS

A. Section 09 2116 - Gypsum Board Assemblies: Openings in partitions
B. Section 09 9113 - Exterior Painting: Field paint finish.
C. Section 09 9123 - Interior Painting: Field paint finish.
D. Division 22 - Plumbing: Plumbing components requiring access.
E. Division 23 - HVAC: Mechanical components requiring access.
F. Division 26 - Electrical: Electrical components requiring access.

1.03 REFERENCE STANDARDS

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide sizes, types, finishes, hardware, scheduled locations, and details of adjoining work.
C. Shop Drawings: Indicate exact position of each access door and/or panel unit.
D. Manufacturer's Installation Instructions: Indicate installation requirements and rough-in dimensions.
E. Project Record Documents: Record actual locations of each access unit.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.
B. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years documented experience.

1.06 GUARANTEE

A. The Contractor shall guarantee his work for a period of One (1) year from date of Substantial Completion. Guarantee shall be on form included in Section 01 7800.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Access Doors:
    1. ACUDOR Products Inc: www.acudor.com.
    2. Karp Associates, Inc: www.karpinc.com.
    3. Milcor, Inc: www.milcorinc.com.

4. Nystrom, Inc: www.nystrom.com.
5. JL Industries: www.jlindustries.com
6. Mifab Manufacturing, Inc: www.mifab.com.
7. Bilco Company: www.bilco.com.
8. Babcock-Davis: www.babcockdavis.com.
9. Elmdor/Stoneman Manufacturing: www.elmdorstoneman.com.
10. Substitutions: See Section 01 6000 - Product Requirements.

2.02 WALL AND CEILING UNITS

A. Door and Frame Units: Gypsum board access panel assembly at Ceiling Conditions.
   1. Materials: Extruded aluminum alloy 6063-T6. Type X (16 mm (5/8 inch) gypsum board inlay. Fiberglass re-enforced nylon. Zinc-plated screws, stainless steel springs. Nylon retaining hooks and installation handles. Rubber gasket.
   2. Flush Access Doors:
      a. Size: 24 inches by 24 inches (610 mm by 610 mm) nominal.
      b. Door: Fabricate using extruded aluminum frame with gypsum board inlay and structural nylon corner elements. The door is to be taped and finished consistent with the surrounding surface.
      c. Frame: Recessed aluminum frame with edge similar to drywall bead against which wall or ceiling surface can be finished.
      d. Hinge: Patented, concealed, two-point pin hinge, non-corroding. Allows door to open 120 degrees. Door can be removed.
      e. Latching/Locking Devices: Concealed touch latch.
      f. Finish: Aluminum frames, gypsum board, nylon and aluminum cam latch, to receive the same finish and paint as the surrounding surface. Do not paint hinge.
   3. Fabrication:
      a. Manufacture each access panel assembly as an integral unit ready for installation.
      b. Recessed Panel: Form face of panel to provide specified recess for application of finish material. Reinforce door as required to prevent sagging.
      c. Furnish number of latches required to hold door in flush smooth plane when closed.
   4. Acceptable Product: Bauco Plus BP58 manufactured by Acudor Products, Inc.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that rough openings are correctly sized and located.

3.02 INSTALLATION

A. Install units in accordance with manufacturer's instructions.
B. Install frames plumb and level in openings, and secure units rigidly in place.
C. Position units to provide convenient access to concealed equipment when necessary.

END OF SECTION 08 3100

SECTION 08 3313

COILING COUNTER DOORS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Furnish all labor, materials, equipment, tools and services required to fully complete all Coiling Counter Door work as is indicated on the drawings and/or specified herein including, but not limited to, the following described items.
B. Non-fire-rated coiling counter doors and operating hardware.
C. Do not include sales tax, refer to Section 00 1115 - Advertisement for Prequalification of Bidders.

1.02 RELATED REQUIREMENTS

A. Section 09 2116 - Gypsum Board Assemblies: Rough openings.
B. Section 26 0533.13 - Conduit for Electrical Systems: Conduit from electric circuit to operator and from operator to control station.

1.03 REFERENCE STANDARDS

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Product Data: Submit manufacturer's standard literature showing materials and details of construction and finish. Include data on electrical operation.
C. Shop Drawings: Indicate rough and actual opening dimensions, anchorage methods, hardware locations, and installation details.
D. Samples: Submit two slats, 4 inch long, illustrating shape, color and finish texture.
E. Manufacturer's Instructions: Indicate installation sequence and installation, adjustment, and alignment procedures.
F. Operation and Maintenance Data: Indicate modes of operation, lubrication requirements and frequency, and periodic adjustments required.
G. Project Record Documents: Include as-built electrical diagrams for electrical operation and connection to fire alarm system.

1.05 GUARANTEE

A. The Contractor shall guarantee his work for a period of One (1) year from date of Substantial Completion. Guarantee shall be on form included in Section 01 7800.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Basis of Design Manufacturer:
    1. The Cookson Company: www.cooksondoor.com.
B. Other Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    1. Alpine Overhead Doors, Inc: www.alpinedoors.com.
    2. Entrematic: www.amarr.com/commercial.
    3. Cornell Iron Works: www.cornelliron.com.
    4. Raynor Rolling Doors: www.raynor.com.
    5. Overhead Door Corp: www.overheaddoor.com.

6. Wayne-Dalton Corp: www.waynedalton.com.
7. Substitutions: See Section 01 6000 - Product Requirements.

2.02 COILING COUNTER DOORS

A. Coiling Counter Doors, Non-Fire-Rated: Aluminum slat curtain.
B. Counter Door Ala-Carte A121 and Ticket A120 (Type ESC -10).
   1. Manual push up.
   2. Face of Wall mounted.
   3. Finish: Clear Anodized.
   4. Interior thumb turn lock.

2.03 COILING COUNTER DOORS WITH INTEGRATED FRAME AND SILL

A. Coiling Counter Doors, Non-Fire-Rated: Aluminum slat curtain.
B. Counter Door: Serving at Softball Filed Press Box (Type ESC -10).
   1. Integrated Frame and Sill.
      a. Finish: Stainless steel.
   2. Manual push up.
   3. Face of Wall mounted.
   4. Finish: Clear Anodized.
   5. Interior thumb turn lock.

2.04 GENERAL FINISH REQUIREMENTS

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
B. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

2.05 DOOR FINISH

A. The finish on the door curtain shall be Cookson Company Clear Anodized or ColorCote finish consisting of the following:
   1. Hot dipped galvanized G-45 coating consistent with ASTM A653/A653M.
   2. Bonderized coating for prime coat adhesion.
   3. Factory applied Thermosetting Powder Coating applied with a minimum thickness of 2 mils. The color shall be selected by the Architect and shall be chosen from standard color chart.

2.06 MATERIALS

A. Guide Construction: Continuous, of profile to retain door in place, with mounting brackets of same metal.
   1. Aluminum Guides: Extruded aluminum channel, with wool pile runners along inside.
B. Latching Mechanism: Inside mounted, adjustable keeper, spring activated latch bar feature to keep in locked or retracted position.
C. Slide Bolt: Provide on single-jamb side, extending into slot in guides, with thumb turn on interior side.
D. Roller Shaft Counterbalance: Steel pipe and torsion steel spring system, capable of producing torque sufficient to ensure smooth operation of curtain from any position and capable of holding position at mid-travel; with adjustable spring tension; requiring 25 lb nominal force to operate.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that opening sizes, tolerances and conditions are acceptable.

3.02 INSTALLATION

A. Install units in accordance with manufacturer's instructions.
B. Use anchorage devices to securely fasten assembly to wall construction and building framing without distortion or stress.
C. Securely and rigidly brace components suspended from structure. Secure guides to structural members only.
D. Fit and align assembly including hardware; level and plumb, to provide smooth operation.
E. Coordinate installation of electrical service with Division 26 - Equipment wiring
F. Install perimeter trim as indicated.

3.03 TOLERANCES

A. Maintain dimensional tolerances and alignment with adjacent work.
B. Maximum Variation From Plumb: 1/16 inch.
C. Maximum Variation From Level: 1/16 inch.
D. Longitudinal or Diagonal Warp: Plus or minus 1/8 inch per 10 ft straight edge.

3.04 ADJUSTING

A. Adjust operating assemblies for smooth and noiseless operation.

3.05 CLEANING

A. Clean installed components.
B. Remove labels and visible markings.

END OF SECTION 08 3313

This page intentionally left blank

SECTION 08 3323

OVERHEAD COILING DOORS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Furnish all labor, materials, equipment, tools and services required to fully complete all Overhead Coiling Door work as is indicated on the drawings and/or specified herein including, but not limited to, the following described items.
B. Overhead coiling doors, operating hardware, fire-rated and non-fire-rated, electric operation.
C. Wiring from electric circuit disconnect to operator to control station.
D. Do not include sales tax, refer to Section 00 1115 - Advertisement for Prequalification of Bidders.

1.02 RELATED REQUIREMENTS

A. Section 07 9200 - Joint Sealants: Sealing joints between frames and adjacent construction.
B. Section 08 3326 - Overhead Coiling Grilles.
C. Section 08 7100 - Door Hardware: Cylinder cores and keys.
D. Division 26 - Conduit: All conduit from electric circuit to operator and from operator to control station.
E. Division 26 - Conduit: Conduit from fire alarm system.
F. Division 26 - Equipment Wiring: Disconnect switch and wiring.

1.03 REFERENCE STANDARDS

A. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2020.
B. ITS (DIR) - Directory of Listed Products; current edition.
C. NEMA ICS 2 - Industrial Control and Systems Controllers, Contactors and Overload Relays Rated 600 Volts; 2008 (Reaffirmed 2020).
D. NFPA 80 - Standard for Fire Doors and Other Opening Protectives; 2022.
E. UL (DIR) - Online Certifications Directory; Current Edition.
F. UL 325 - Standard for Door, Drapery, Gate, Louver, and Window Operators and Systems; Current Edition, Including All Revisions.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide general construction, component connections and details, electrical equipment.
C. Shop Drawings: Indicate pertinent dimensioning, anchorage methods, hardware locations, and installation details.
D. Manufacturer's Installation Instructions: Indicate installation sequence and procedures, adjustment and alignment procedures.
E. Maintenance Data: Indicate lubrication requirements and frequency and periodic adjustments required.

1.05 QUALITY ASSURANCE

A. Products Requiring Electrical Connection: Listed and classified by UL (DIR) as suitable for the purpose specified and indicated.

1.06 GUARANTEE

A. The Contractor shall guarantee his work for a period of One (1) year from date of Substantial Completion. Guarantee shall be on form included in Section 01 7800.
B. Manufacturer shall warranty overhead coiling door for a period of One (1) year from date of Substantial Completion against defects in material and workmanship.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Basis of Design Manufacturer:
   1. The Cookson Company: www.cooksondoor.com.
B. Other Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Alpine Overhead Doors, Inc: www.alpinedoors.com.
   2. Cornell Iron Works, Inc: www.cornelliron.com.
   3. Entrematic; Amarr 4000 Rolling Slat Door: www.amarr.com/commercial.
   4. Raynor Rolling Doors: www.raynor.com.
   5. Overhead Door Corp: www.overheaddoor.com.
   6. Mckeon Door Company : www.mckeondoor.com.
   7. Substitutions: See Section 01 6000 - Product Requirements.

2.02 COILING DOORS

A. Insulated Service Doors (Scene Shop, Receiving and Shed) (Type ESD-20).
   1. Motor Operated Insulated Service Door.
   2. Face of Wall Mounted.
   3. Powder Coat Finish: Color as selected by Architect.
B. Fire-Rated Service Door (Stage to Scene Shop) (Type ERD-10).
   1. Motor Operated Fire Door - Auto Test (Type ALARM GUARD).
   2. Face of Wall Mounted - Smoke Detector Activated.
   3. Powder Coat Finish: Color as selected by Architect.
C. Service Door (Softball Dugout and Pressbox Storage) (Type ESD-10).
   1. Manual push up.
   2. Face of Wall Mounted.
   3. Lockable from exterior with padlock.
   4. Heavy Duty 18 Gauge Steel Slats.
   5. Powder Coat Finish: Color as selected by Architect.
D. Service Door (Shop to Material Storage) (Type ESD-10).
   1. Motor Operated.
   2. Face of Wall Mounted.
   3. Powder Coat Finish: Color as selected by Architect.
E. Non-Fire-Rated Interior Coiling Doors: Steel slat curtain.
   1. Curtain: Interconnected 20 gauge strip steel slats conforming to ASTM A-653.
   2. Nominal Slat Size: 2-1/4 inches high x 5/8 inch (16 mm) deep.
   3. Finish: Factory applied Thermoset Powder Coating, 2 mils thick minimum, custom color as selected by Architect.
   4. Bottom Bar: Two 1/8 inch steel angles mechanically joined together with a 1 inch diameter vinyl covered foam edge astragal continuous along the bottom. The finish on the bottom bar shall be as indicated for the curtain.

5. Guides: 3 steel angles bolted together with 3/8 inch fasteners to form a channel for the curtain to travel and shall include an extruded vinyl snap-on weatherstripping continuously along the exterior leg of the guide. The wall angle portion shall be continuous and fastened to the surrounding structure with either minimum 1/2 inch fasteners or welds, both on 36 inch centers. The finish on the guide angles shall be as indicated for the curtain.
6. Brackets: Constructed of steel not less than 1/4 inch thick and shall be bolted to the wall angle with minimum 1/2 inch fasteners. The finish on the brackets shall be as indicated for the curtain.
7. Gears: Cast iron with teeth cast from machine cut patterns. The pinion gear shall not be less than a 3 inch pitch diameter. The gear ratio shall be designed for a maximum effort of not more than 30 pounds.
8. Barrel: Steel tubing of not less than 4 inches in diameter. Oil tempered torsion springs shall be capable of correctly counter balancing the weight of the curtain. The barrel shall be designed to limit the maximum deflection to .03 inches per foot of opening width. The springs shall be adjusted by means of an exterior wheel. The finish on the barrel shall be one (1) coat of bronze rust-inhibiting prime paint.
9. Hood Enclosure: 24 gage galvanized steel and shall be formed to fit the curvature of the brackets. The hood shall contain a waterproof baffle to control air infiltration. The finish on the hood shall be as indicated for the curtain.
    a. Enclosure to conceal barrel and gear assemblies.
10. Mounting: Within framed opening.

F. Fire-Rated Coiling Doors: Steel slat curtain; conform to NFPA 80.
1. Fire Rating: 1 hour fire rating.
2. Provide products listed and labeled by ITS (DIR) or ITS (DIR) as suitable for the purpose specified and indicated.
3. Curtain: Interconnected 20 gauge strip steel slats conforming to ASTM A-653.
4. Nominal Slat Size: 2-1/4 inches high x 5/8 inch (16 mm) deep.
5. Finish: Factory applied Thermoset Powder Coating, 2 mils thick minimum, standard color as selected by Architect.
6. Bottom Bar: Two 1/8 inch steel angles mechanically joined together. The finish on the bottom bar shall be as indicated for the curtain.
7. Guides: 3 steel angles bolted together with 3/8 inch fasteners to form a channel for the curtain to travel. The wall angle portion shall be continuous and fastened to the surrounding structure with minimum 1/2 inch fasteners. The finish on the guide angles shall be as indicated for the curtain.
8. Brackets: Constructed of steel not less than 1/4 inch thick and shall be bolted to the wall angle with minimum 1/2 inch fasteners. The finish on the brackets shall be as indicated for the curtain.
9. Barrel: Steel tubing of not less than 4 inches in diameter. Oil tempered torsion springs shall be capable of correctly counter balancing the weight of the curtain. The barrel shall be designed to limit the maximum deflection to .03 inches per foot of opening width. The springs shall be adjusted by means of an exterior wheel. The finish on the barrel shall be one (1) coat of bronze rust-inhibiting prime paint.
10. Hood Enclosure: 24 gage galvanized steel and shall be formed to fit the curvature of the brackets. The hood shall contain a waterproof baffle to control air infiltration. The finish on the hood shall be as indicated for the curtain.
    a. Enclosure to conceal barrel and gear assemblies.
11. Guides: Angles; galvanized steel, finish to match slats.
12. Hood Enclosure: Manufacturer's standard; galvanized steel, finish to match slats.
13. Operation:

a. All automatic resetting chain operated fire doors shall have an automatic closing device, and Governor to control the downward speed of the door. The door shall become operational upon the activation of a smoke detector or interruption of power. The door shall have an average closing speed of not less than six (6) inches per second and not more than twenty-four (24) inches per second as indicated in NFPA Bulletin 80. The Governor shall be fail-safe, maintenance free, fully enclosed and warranted for the life time of the door. Once the door has closed, it automatically resets by clearing the fire alarm or smoke detection system at which time the chain operator shall be able to open the door. Mechanical resetting by engaging or using levers, pulleys or ladders is not acceptable or required.

b. Manual hand chain lift operation. Chain operated doors shall open and close with a maximum of 30 pounds of effort, utilizing an endless chain and gear reduction.

c. All fire doors shall be equipped with Time Delayed Releasing Device.
   1) Releasing Device must be powered from 24 volt DC recieved from an approved UL 148 regulated power supply with battery backup.
   2) During installation and subsequent resetting of the fire door, the latching mechanism shall hold the door in the set position. Engergizing the alarm system shall automatically set by releasing the latching mechanism.
   3) The controls shall hold the fire door in the set position until the alarm or smoke detection system is activated. Upon activation, control shall mechanically release the fire door after a delay of not more than 10 seconds. If the fire alarm activation is canceled before the 10 secton delay, the controls shall automatically reset itself.
   4) If the control mechanicallly closes the fire door, the door will have to be reset by an authorized trained technician.

14. Mounting: As indicated.

2.03 MATERIALS

1. Curtain Bottom: Extruded tubular aluminum bottom bar with vinyl astragal.

B. Steel Slats: Minimum 20 gauge (0.76 mm thick) ASTM A 653/A 653M galvanized steel sheet.
   1. Galvanizing: Minimum G90 /Z275 coating.
   2. Formed from galvanized steel sheet, complying with ASTM A653/A653M.
   3. Galvanizing: Minimum G90/Z275 coating

C. Hood Enclosure: Aluminum with reinforced top and bottom edges. Provide minimum 1/4 inch (6.35 mm) steel intermediate support brackets as required to prevent excessive sag.
   1. Finish: Clear anodized.

2.04 ELECTRIC OPERATION

A. Operator, Controls, Actuators, and Safeties: Comply with UL 325; provide products listed by ITS (DIR), UL (DIR), or testing agency acceptable to authorities having jurisdiction.
   1. Provide interlock switches on motor operated units.

B. Electric Operators:
   1. Supply Electric Tube Motor Operator - rated for a maximum of 10 cycles per day, cULus recognized, rated as recommended by door manufacturer for size and type of door, 110 Volts, 1 Phase. Provide complete with electric tube motor, maintenance free electric brake, emergency manual crank hoist and control stations. Motor shall be protected against overload with an auto-reset thermal sensing device. Operator shall be equipped with an emergency manual crank hoist assembly that safely cuts operator power when engaged. A disconnect chain shall not be required to engage or release the manual crank hoist. Operator shall be capable of 10-14 RPM. Fully adjustable, mechanical internal worm limit switch mechanism shall synchronize the operator with the door.

C. Control Station: Standard three button (OPEN-STOP-CLOSE) constant pressure control for each operator.
   1. 24 volt circuit.
   2. Surface mounted.

D. Safety Edge: Located at bottom of curtain, full width, electro-mechanical sensitized type, wired to stop operator upon striking object, hollow neoprene covered.
   1. Manufacturers:
      a. Miller Edge, Inc: www.milleredge.com.
      b. Substitutions: See Section 01 6000 - Product Requirements.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that opening sizes, tolerances and conditions are acceptable.

3.02 INSTALLATION

A. Install units in accordance with manufacturer's instructions.
B. Install fire-rated doors in accordance with NFPA 80.
C. Use anchorage devices to securely fasten assembly to wall construction and building framing without distortion or stress.
D. Securely and rigidly brace components suspended from structure. Secure guides to structural members only.
E. Fit and align assembly including hardware; level and plumb, to provide smooth operation.
F. Coordinate installation of electrical service with Section 26 0583.
G. Coordinate installation of electrical service with Division 26 - Electrical.
H. Complete wiring from disconnect to unit components.
I. Complete wiring from fire alarm system.
J. Install perimeter trim and closures.

3.03 TOLERANCES

A. Maintain dimensional tolerances and alignment with adjacent work.
B. Maximum Variation From Plumb: 1/16 inch.
C. Maximum Variation From Level: 1/16 inch.
D. Longitudinal or Diagonal Warp: Plus or minus 1/8 inch per 10 ft straight edge.

3.04 ADJUSTING

A. Adjust operating assemblies for smooth and noiseless operation.

3.05 CLEANING

A. Clean installed components.
B. Remove labels and visible markings.

END OF SECTION 08 3323

This page intentionally left blank

SECTION 08 3326

OVERHEAD COILING GRILLES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Furnish all labor, materials, equipment, tools and services required to fully complete all Overhead Coiling Grille work as is indicated on the drawings and/or specified herein including, but not limited to, the following described items.
B. Overhead coiling metal grilles and operating hardware, with electric operation.
C. Wiring from electric circuit disconnect to operator to control station.
D. Do not include sales tax, refer to Section 00 1115 - Advertisement for Prequalification of Bidders.

1.02 RELATED REQUIREMENTS

A. Section 05 1200 - Structural Steel Framing: Support framing.
B. Section 08 3323 - Overhead Coiling Doors.
C. Section 08 7100 - Door Hardware: Cylinder cores and keys.
D. Division 26 - Equipment Wiring: Disconnect switch and wiring.

1.03 REFERENCE STANDARDS

A. AAMA 611 - Voluntary Specification for Anodized Architectural Aluminum; 20.
B. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2021.
C. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric); 2021.
D. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum); 2020.
E. NEMA ICS 2 - Industrial Control and Systems Controllers, Contactors and Overload Relays Rated 600 Volts; 2008 (Reaffirmed 2020).
F. NEMA MG 1 - Motors and Generators; 2018.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide general construction, component connections and details and electrical equipment, electrical equipment.
C. Shop Drawings: Indicate pertinent dimensioning, anchorage methods, hardware locations, and installation details.
D. Manufacturer's Installation Instructions: Indicate installation sequence and procedures, adjustment and alignment procedures.
E. Maintenance Data: Indicate lubrication requirements and frequency and periodic adjustments required.

1.05 QUALITY ASSURANCE

A. Provide certificate of compliance from authorities having jurisdiction indicating approval of grille and operating hardware assembly.
B. Products Requiring Electrical Connection: Listed and classified by UL (DIR) as suitable for the purpose specified and indicated.

1.06 GUARANTEE

A. The Contractor shall guarantee his work for a period of One (1) year from date of Substantial Completion. Guarantee shall be on form included in Section 01 7800.
B. Manufacturer shall warranty overhead coiling door for a period of One (1) year from date of Substantial Completion against defects in material and workmanship.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Overhead Coiling Grilles:
   1. The Cookson Company: www.cooksondoor.com.
   2. Entrematic: www.amarr.com/commercial.
   3. Alpine Overhead Doors, Inc: www.alpinedoors.com.
   4. Cornell Iron Works, Inc: www.cornelliron.com.
   5. Raynor Rolling Doors: www.raynor.com.
   6. Wayne-Dalton, a Division of Overhead Door Corporation: www.waynedalton.com.
   7. McKeon Door Company: www.mckeondoor.com.
   8. Substitutions: See Section 01 6000 - Product Requirements.

2.02 COILING GRILLES

A. Locations: Serving.
B. Material and Finish: ASTM B 221 (ASTM B 221M), Aluminum alloy 6063-T6, clear anodized 204R1, AAMA 611 AA-M10C22A31 Class II.
C. Curtain: Solid 5/16 inch diameter horizontal aluminum rods on 2 inch centers with 1/8 inch aluminum hinged vertical connecting links (5/8 inch deep by 3-3/4 inches high) 9 inches on center. The finish on the rods and links shall be 204-R1 clear anodized.
D. Bottom Bar: Extruded aluminum tube measuring 4 inches high by 1-3/4 inches deep and shall include a cordless safety edge system. The finish on the bottom bar shall be 204-R1 clear anodized.
E. Guides: 1/4 inch thick continuous aluminum wall angle connected to 1-1/2 inch by 2-1/2 inch by 1/8 inch thick continuous extruded aluminum guide section. Continuous nylon wear strips shall be inserted on both sides of the guide to eliminate metal-to-metal contact. The aluminum wall angle and the aluminum guide shall be 204-R1 clear anodized finish.
F. Brackets: Steel not less than 1/4 inch thick. The finish on the brackets shall be one (1) coat of aluminum prime paint.
G. Barrel: Steel tubing of not less than 6 inches in diameter. Oil tempered torsion springs shall be capable of correctly counter balancing the weight of the curtain. The barrel shall be designed to limit the maximum deflection to .03 inch per foot of opening width. The springs shall be adjusted by means of an exterior wheel. The finish on the barrel shall be one (1) coat of bronze rust-inhibiting paint.
H. Hood Enclosure: Not required.
I. Operation

1. The grille shall be operated at a speed of 2/3 foot per second by an open drip-proof electric motor with gear reducer in oil bath. The motor operator shall include a geared limit switch, and an electrically interlocked emergency chain operator. The motor starter shall be housed in a NEMA 1 housing and include a magnetic reversing starter size 0, a 24 volt control transformer, and complete terminal strip to facilitate field wiring. The motor operator shall be activated by a 3 button push-button station in a NEMA 1 enclosure. The motor shall be size as required by the grille (115 volts single phase, confirm with Electrical). The motor operator shall be mounted to the grille bracket as shown on drawings. All motor operators shall be U.L. listed.
2. The grille shall have installed on the bottom bar a sensor that will automatically reverse the door if the sensor detects an obstruction in the downward travel of the door.
    a. The sensor shall consist of a rubber boot attached below the bottom bar with a switch secured to the back of the bottom bar. The sensor shall operate with air wave technology and shall not rely on pneumatic pressure or electrical contacts to operate. The sensor shall create an air wave that shall be detected by the switch which reverses the downward direction of the rolling door.
    b. The sensor shall not require a connection cord or any means of electrical connection to the motor control panel.
    c. The sensor shall be of fail-safe construction, and on every cycle shall perform a self diagnostic test. If any part of the sensor fails, the door closing operation shall change from momentary pressure to constant pressure requiring constant pressure on the close control station to move the door in a downward motion. Repairing the sensor will automatically return the closing operation to momentary pressure.
    d. The operation of the sensor shall not be subject to interferences by temperature, barometric pressure, water infiltration, or punctures and small tears.
    e. The sensor shall perform with an extremely small amount of impact pressure.

J. Locking Mechanism: Motor operated grilles shall be secured by means of a cylinder lock in the bottom bar, electrically interlocked to prevent the motor from operating when the grille is locked.

K. Basis of Design Product: Model ESG10 - Motor Operated Rolling Grill. by the Cookson Company
1. Location: A111 Serving.
    a. Guide construction: Face of wall Z with tubes as detailed on the drawings.
    b. Curtain Design: 2" Rod Spacing, V6 pattern.
2. Location: B108 School Store.
    a. Guide construction: Face of wall E as detail on the drawings.
    b. Curtain Design: 2" Rod Spacing, V6 pattern.

2.03 MATERIALS

A. Aluminum: ASTM B221 (ASTM B221M). 5056 H32 alloy.

2.04 ELECTRIC OPERATION

A. Electric Operators:
1. Industrial duty - rated for a maximum of 20 cycles per hour, cULus listed, totally enclosed non-ventilated gear head operator rated as recommended by door manufacturer for size and type of door, 110 Volts, 1 Phase.
    a. Provide complete with electric motor and factory pre-wired motor control terminals, maintenance free solenoid actuated brake, provisions for auxiliary push-up operation and control station.
    b. Motor shall be high starting torque, industrial type, protected against overload with an auto-reset thermal sensing device. Primary speed reduction shall be heavy-duty, lubricated gears with mechanical braking to hold the door in any position.

c. Operator shall be equipped with a disconnect cable for auxiliary push-up operation. Operator drive and door driven sprockets shall be provided with #50 roller chain.
d. Provide an integral motor mounted interlock system to prevent damage to door and operator when mechanical door locking devices are used.
e. Operator shall be capable of driving the door at a speed of 6 to 9 inches per second (15 to 23 cm/sec). Fully adjustable, driven linear screw type cam limit switch mechanism shall synchronize the operator with the door.

2. Mounting: Side mounted above coil.

B. Control Station: Standard three button (OPEN-STOP-CLOSE) constant pressure control for each operator.
1. Surface mounted.

C. Safety Edge: Located at bottom of curtain, full width, electro-mechanical sensitized type, wired to reverse operator upon striking object, hollow neoprene covered. Provide a wireless sensing edge connection to motor operator.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that opening sizes, tolerances and conditions are acceptable.

3.02 INSTALLATION

A. Install grille unit assembly in accordance with manufacturer's instructions.
B. Use anchorage devices to securely fasten assembly to wall construction and building framing without distortion or stress.
C. Securely and rigidly brace components suspended from structure. Secure guides to structural members only.
D. Fit and align assembly including hardware; level and plumb, to provide smooth operation.
E. Coordinate installation of electrical service with Division 26 - Electrical.
F. Complete wiring from disconnect to unit components.
G. Install perimeter trim and closures.

3.03 TOLERANCES

A. Maintain dimensional tolerances and alignment with adjacent work.
B. Maximum Variation From Plumb: 1/16 inch.
C. Maximum Variation From Level: 1/16 inch.
D. Longitudinal or Diagonal Warp: Plus or minus 1/8 inch per 10 ft straight edge.

3.04 ADJUSTING

A. Adjust grille, hardware and operating assemblies for smooth and noiseless operation.

3.05 CLEANING

A. Clean grille and components.
B. Remove labels and visible markings.

END OF SECTION 08 3326

SECTION 08 4113.13

FIRE-RATED ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS GPX ARCHITECTURAL SERIES FRAMING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Furnish all labor, materials, equipment, tools, and services required to fully complete all Fire-Rated Aluminum Framed Entrances and Storefront word as is indicated on the drawings and/or specified herein including, but not limited to, the following described items:
B. Fire resistive framing system.
   1. Architectural Series Framing fire resistive, temperature rise, framing system with aluminum or decorative cladding for 120 minute interior applications.
   2. Applications of fire rated framing includes:
      a. Vision lites in fire rated doors, full vision fire rated doors, sidelites, borrowed lites, windows, transoms and transparent walls with fire rating requirement as specified.

1.02 RELATED SECTIONS

A. Section 08 8000: Glazing.
B. Section 08 1113: Hollow Metal Doors and Frames.
C. Section 08 1116: Aluminum Doors and Frames.
D. Section 08 4413: Glazed Aluminum Curtain Walls.
E. Section 08 7100: Door Hardware.

1.03 REFERENCES

A. American Society for Testing and Materials (ASTM):
   1. ASTM E119 Methods for Fire Tests of Building Construction and Materials.
   2. ASTM E152 Methods of Fire Tests of Door Assemblies.
   3. ASTM E163 Methods for Fire Tests of Window Assemblies.
   4. ASTM E2074: Standard Test Method for Fire Tests of Door Assemblies, including Positive Pressure Testing of Side-hinged and Pivoted Swinging Door Assemblies.
   5. ASTM E2110-1: Standard Test for Positive Pressure of Fire Tests of Window Assemblies.
   6. ASTM E283-04: Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls and Doors.
   7. ASTM 547-00: Test Method for Water Penetration of Exterior Windows, Curtain Walls and Doors by Cyclic Static Air Pressure Difference.
   8. ASTM E331-00: Standard Test Method for Metal Curtain Walls and Doors by Uniform Static Air Pressure Difference.
   9. ASTM E330-02: Structural Performance of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.
   10. ASTM F588-04: Test Method for Resistance of Window Assemblies to Forced Entry Excluding Glazing.
B. National Fire Protection Association (NFPA):
   1. NFPA 80: Fire Doors and Windows.
   2. NFPA 251: Fire Tests of Building Construction and Materials.
   3. NFPA 252: Fire Tests of Door Assemblies.
   4. NFPA 257: Fire Tests of Window Assemblies.
C. Underwriters Laboratories, Inc. (UL):

1. UL 9: Standard for Safety of Fire Tests of Window Assemblies.
2. UL 10B: Standard for Safety of Fire Tests of Door Assemblies.
3. UL 10C: Standard for Safety of Positive Pressure Fire Tests of Door Assemblies.
4. UL 263: Fire Tests of Building Construction and Materials.
5. UL 752-2005: Standard for Safety for Bullet-Resisting Equipment.

D. Standard Council of Canada (ULC):
1. ULC Standard CAN4-S101: Fire Tests of Building Construction and Materials.
2. ULC Standard CAN4-S104: Fire Tests of Door Assemblies.
3. ULC Standard CAN4-S106: Fire Tests of Window Assemblies.

E. Consumer Product Safety Commission (CPSC):
1. CPSC 16 CFR 1201: Safety Standard for Architectural Glazing Materials.

F. American National Standards Institute (ANSI):
1. ANSI Z97.1: Safety Glazing Materials Used in Buildings - Safety Performance Specifications and Methods of Test.

G. Glass Association of North America (GANA)
1. GANA – Glazing Manual.
2. FGMA – Sealant Manual.

H. National Fenestration Rating Council (NFRC)
1. NFRC 100: Procedure for Determining Fenestration Product U-Factors.
2. NFRC 200: Procedure for Determining Fenestration Product Solar Heat Gain Coefficient and Visible Transmittance at Normal Incidence.

I. [American Recovery and Reinvestment Act
1. Section 1605, Title XVI Buy American Provision]

J. Insert building code used by Authority Having Jurisdiction

1.04 SYSTEM DESCRIPTION

A. Performance Requirements:
1. Fire Rating: 120 minutes as specified.
2. Fire Resistive Wall Assembly Certifications: must meet 120 minute fire resistive wall assemblies tested in accordance with ASTM E119, NFPA 251, UL 263 and ULC-S101.

B. Listings and Labels:
1. Fire resistive, temperature rise framing system shall be under current follow-up service by a nationally recognized independent laboratory approved by OSHA and maintain a current listing or certification. Assemblies shall be labeled in accordance with limits of listings.

C. Appearance:
1. Fire rated wall/door assembly shall have a neat finished appearance with minimum joints at decorative cover intersections.

1.05 SUBMITTALS

A. Submit listed submittals in accordance with Conditions of the Contract and Division 1 Submittal Procedure Section.
1. Shop Drawings: Submit shop drawings showing layout, profiles and product components.
2. Samples: Submit samples for finishes, colors and textures.
3. Technical Information: Submit latest edition of manufacturer’s product data providing product descriptions, technical data and installation instructions.

1.06 DELIVERY, STORAGE AND HANDLING

A. General: Comply with Division1 Product Requirements Sections.

B. Ordering: Comply with manufacturer’s ordering instructions and lead-time requirements to avoid construction delays.

C. Delivery: Deliver materials to specified destinations in manufacturer's or distributor's packaging undamaged, complete with installation instructions.
D. Storage and Protection: Store off ground, under cover, protected from weather and construction activities and at temperature conditions recommended by manufacturer.

1.07 FABRICATION DIMENSIONS

A. Field Measurements: Verify actual measurements for openings by field measurements before fabrication. Show recorded measurements on shop drawings. Coordinate field measurements and fabrication schedule with construction progress to avoid construction delays.

1.08 WARRANTY

A. Project Warranty: Refer to Conditions of the Contract for project warranty provisions.
B. Manufacturer's Warranty: Submit, for Owner's acceptance, manufacturer's standard warranty document. Manufacturer's warranty is not intended to limit other rights that the Owner may have under the Contract Documents.
    1. Warranty Period: 5-year limited warranty from date of shipping.

PART 2 PRODUCTS

2.01 MANUFACTURERS – FIRE RATED (DOOR) (OPENING) (WALL ASSEMBLY)

A. Basis of Design Manufacturer of Framing System: GPX Architectural Series Framing as manufactured and distributed by SAFTI FIRST Fire Rated Glazing Solutions. 1. Contact: 100 N Hill Drive, Suite 12, Brisbane, CA 94005; Telephone 888.653. 3333; email info@safti.co; Web site www.safti.com
B. Basis of Design Manufacturer of Glazing Material: (SuperLite® II-XL) (SuperLite® II-XL IGU) (SuperLite® II-XLB) (SuperLite® II-XLM) as manufactured and distributed by SAFTI FIRST® Fire Rated Glazing Solutions.
    1. Contact: 100 N Hill Drive, Suite 12, Brisbane, CA 94005; Telephone 888.653. 3333; Fax 888.653.4444; email info@safti.co; Web site www.safti.com.
C. Substitutions: See Section 01 6000 - Product Requirements
D. Fire rated glass and framing must be provided by a single-source, US manufacturer. Distributors of fire rated glass and framing are not to be considered as manufacturers. Materials for the project should be shipped together in the same shipment on the same truck.

2.02 MATERIALS – FRAMING

A. Fire resistive, temperature rise framing system rated for 120 minutes.
B. Properties:
    1. Window/Wall Frame thickness: 2-1/2 inches. Door profile thickness: 5 inches.
    2. Fire-resistive aluminum door capable of accommodating concealed hardware.
    3. Internal framing: Internal tube steel framing shall conform to ASTM A501. Formed steel retainers shall be galvanized conforming to ASTM A527.
    4. Insulation: The framing system shall insulate against the effects of fire, smoke and heat transfer from either side. The perimeter of the framing system to the rough opening shall be firmly packed with mineral wool fire stop insulation or appropriately rated intumescent sealant.
    5. Fasteners: Type recommended by manufacturer. No exposed fasteners allowed.
    6. Glazing accessories: The glazing material perimeter shall be separated from the perimeter framing system with approved flame retardant glazing tape. The SuperLite® glazing panel shall be caulked continuously around the edge to the tube steel frame utilizing neutral cure silicone. Silicone setting blocks recommended.
    7. SAFTI FIRST listing allows for doors by others.

2.03 MATERIALS – GLASS

A. Assemblies shall be glazed with SuperLite® glazing products. If assembly is required to meet ASTM E119/UL 263/ULC-S101, (SuperLite® II-XL) (SuperLite® IIXLB) (SuperLite® II-XLM) will be used.
B. Properties:
   1. Individual Lites shall be permanently identified with a listing mark.
   2. Glazing material installed in “Hazardous Locations” (subject to human impact) shall be certified to meet the applicable requirements for fire rated assemblies referenced in ANSI Z97.1 Standard for Safety Glazing Materials Used In Buildings and/or CPSC 16 CFR 1201 Safety Standard for Architectural Glazing Materials.
   3. Temperature rise on the unexposed side of glazing material shall be limited to 250 degrees Fahrenheit when required.
   4. Pressure glazing is acceptable.

2.04 FABRICATION

A. Assemblies shall be shop fabricated should configurations and job site conditions allow.
B. Door assemblies shall be factory prepared for field mounting of hardware.
C. Fabrication Dimensions: Fabricate to approved dimensions. The general contractor shall guarantee dimensions within required tolerance. Obtain approved shop drawings prior to fabrication.

2.05 FINISHES

A. Comply with NAAMM’s “Metal Finishes Manual for Architectural and Metal Products” for recommendations for applying and designing finishes.
B. Covers shall be chemically cleaned and pretreated; then, finished with (choose one): 1. High Performance Coraflon Fluoropolymer Finish by PPG®. Solid color to be selected from SAFTI’s Standard Color Chart. Mica, XL, Gloss & Exotics are available at an additional charge.
   1. Clear, Bronze or Black Anodized.
   2. Decoral® (specify color).
   3. Ornamental metal (specify finish).
   4. Wood veneer (natural finish standard).
   5. Acrylic urethane custom color.
   6. Other.
C. Protect finishes on exposed surfaces from damage by applying strippable, temporary protective covering before shipping.
D. Variations in appearance of abutting or adjacent pieces are acceptable. Noticeable variations in the same piece are not acceptable.

2.06 DOOR HARDWARE FOR SINGLE AND PAIRED DOORS

A. Hardware shall be supplied with the fire door. Hardware selection shall be from door manufacturer’s standard recommended hardware groups as specified below. Please call manufacturer for custom hardware.
B. Standard operating hardware for single and pair doors.

Quantity	Item	Description	Manufacturer	Finish
1	Hinges	Heavy-duty Continuous Geared OKC	Pemko	Anodized

1	Panic Device	Modern Touchbar with Surface Vertical Rods	Von Duprin 9827F w/ 996 L-trim	US26D
1	Closing Device	Heavy-duty Surface Applied Closer	LCN 4040xp	Aluminum
1	Auto Door Bottoms	420APKL	Pemko	

PART 3 EXECUTION

3.01 MANUFACTURER'S INSTRUCTIONS

A. Compliance: Comply with manufacturer's product data including product technical bulletins and installation instructions.

3.02 EXAMINATION

A. Site Verification of Conditions: Verify substrate conditions, have been previously installed under other sections, and are acceptable for product installation in accordance with manufacturer's instructions. Openings shall be plumb, square and within allowable tolerances. The Architect/Engineer shall be notified of any conditions that jeopardize the integrity of the proposed fire wall/door framing system. Do not proceed until such conditions are corrected.

3.03 INSTALLATION

A. Fire wall/door installation shall be by a licensed contractor and in strict accordance with the approved shop drawings.

3.04 CLEANING AND PROTECTION

A. Protect glass from contact with contaminating substances resulting from construction operations. Remove such substances by method approved by manufacturer.
B. Wash glass on both faces not more than four days prior to date schedule for inspections intended to establish date of Substantial Completion. Wash glass by method recommended by glass manufacturer.
C. Remove temporary coverings and protection of adjacent work areas.
D. Remove construction debris from project site and legally dispose of debris.

END OF SECTION 08 4113.13

This page intentionally left blank

SECTION 08 4413

GLAZED ALUMINUM CURTAIN WALL

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Furnish all labor, materials, equipment, tools, and services required to fully complete all Aluminum Curtain Wall work as is indicated on the drawings and/or specified herein including, but not limited to, the following described items.
B. Aluminum-framed curtain wall, with vision glazing and glass and metal infill panels.
   1. Including perimeter trims, stools, accessories, shims and anchors.
C. Furnish and install all detailed matching aluminum brake metal closures and trim.
D. Structural steel within or needed for Curtain Wall to be furnished by this Contractor.
E. Do not include sales tax, refer to Section 00 1115 - Advertisement for Prequalification of Bidders.

1.02 RELATED REQUIREMENTS

A. Section 03 3000 - Cast-in-Place Concrete: Weld plates embedded in concrete for attachment of anchors.
B. Section 05 1200 - Structural Steel Framing: Steel attachment members.
C. Section 05 5000 - Metal Fabrications: Steel attachment devices.
D. Section 07 2500 - Weather Barriers: Perimeter air seal between glazing system and adjacent construction.
E. Section 07 8400 - Firestopping: Firestop at system junction with structure.
F. Section 07 9200 - Joint Sealants: Sealing joints between frames and adjacent construction.
G. Section 08 4313 - Aluminum-Framed Storefronts: Entrance framing and doors.
H. Section 08 8000 - Glazing
I. Section 09 2116 - Gypsum Board Assemblies: Metal stud and gypsum board wall at interior of curtain wall.
J. Section 12 2413 - Roller Window Shades: Attachments to framing members.

1.03 REFERENCE STANDARDS

A. AAMA CW-10 - Care and Handling of Architectural Aluminum from Shop to Site; 2015.
B. AAMA 501.1 - Standard Test Method for Water Penetration of Windows, Curtain Walls and Doors Using Dynamic Pressure; 2017.
C. AAMA 501.2 - Standard Test Method for Hydraulic Bursting Strength of Knitted Goods and Nonwoven Fabrics--Diaphragm Bursting Strength Tester Method; 2013.
D. {RSTEMP#40}AAMA 501.4 - Recommended Static Test Method for Evaluating Curtain Wall and Storefront Systems Subjected to Seismic and Wind Induced Interstory Drifts{CH#56682}.
E. AAMA 609 & 610 - Cleaning and Maintenance Guide for Architecturally Finished Aluminum (Combined Document); 2015.
F. AAMA 611 - Voluntary Specification for Anodized Architectural Aluminum; 2020.
G. AAMA 1503 - Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors and Glazed Wall Sections; 2009.
H. AAMA 2603 - Voluntary Specification, Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix); 2021.
I. ASCE 7 - Minimum Design Loads and Associated Criteria for Buildings and Other Structures; Most Recent Edition Cited by Referring Code or Reference Standard.

J. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2019.
K. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2017.
L. ASTM B209/B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2021a.
M. ASTM C661 - Standard Test Method for Indentation Hardness of Elastomeric-Type Sealants by Means of a Durometer; 2015 (Reapproved 2022).
N. ASTM C793 - Standard Test Method for Effects of Laboratory Accelerated Weathering on Elastomeric Joint Sealants; 2005 (Reapproved 2017).
O. ASTM C794 - Standard Test Method for Adhesion-In-Peel of Elastomeric Joint Sealants; 2018.
P. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2018.
Q. ASTM C1087 - Standard Test Method for Determining Compatibility of Liquid-Applied Sealants with Accessories Used in Structural Glazing Systems; 2016.
R. ASTM C1135 - Standard Test Method for Determining Tensile Adhesion Properties of Structural Sealants; 2019.
S. ASTM C1184 - Standard Specification for Structural Silicone Sealants; 2018, with Editorial Revision.
T. ASTM C1249 - Standard Guide for Secondary Seal for Sealed Insulating Glass Units for Structural Sealant Glazing Applications; 2018.
U. ASTM C1401 - Standard Guide for Structural Sealant Glazing; 2014.
V. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements; 2009 (Reapproved 2016).
W. ASTM E330/E330M - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference; 2014 (Reapproved 2021).
X. ASTM E413 - Classification for Rating Sound Insulation; 2016.
Y. ASTM E547 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Cyclic Static Air Pressure Difference; 2000 (Reapproved 2016).
Z. ASTM E1105 - Standard Test Method for Field Determination of Water Penetration of Installed Exterior Windows, Skylights, Doors, and Curtain Walls, by Uniform or Cyclic Static Air Pressure Difference; 2015.
AA. ICC (IBC) - International Building Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
BB. ICC (IECC) - International Energy Conservation Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
CC. SSPC-Paint 20 - Zinc-Rich Coating (Type I - Inorganic, and Type II - Organic); 2019.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordinate with installation of other components that comprise the exterior enclosure.
B. Preinstallation Meeting: Conduct a preinstallation meeting one week before starting work of this section; require attendance by all affected installers.

1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.
B. Product Data: Provide component dimensions, describe components within assembly, anchorage and fasteners, glazing and infill, 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. Shop Drawings: Provide details of proposed structural sealant glazing (SSG) and weather sealant joints indicating dimensions, materials, bite, thicknesses, profile, and support framing.

E. Samples: Submit two samples 12 inches by 12 inches in size illustrating finished aluminum surface, glazing, infill panels, and glazing materials.
F. Structural Sealant Glazing (SSG): Submit product data and calculations showing compliance with performance requirements.
G. Test Reports: Submit results of full-size mock-up testing. Reports of tests previously performed on the same design are acceptable.
H. Field Quality Control Submittals: Report of field testing for water penetration and air leakage.
I. Warranty: Submit manufacturer warranty and ensure forms have been completed in Murray City School District 's name and registered with manufacturer.

1.06 QUALITY ASSURANCE

A. Designer Qualifications: Design curtain wall and its structural support framing components under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed at the State in which the Project is located.
B. Full-Size Mock-up Testing: Have a specimen representative of project conditions tested by an independent testing agency for compliance with specified thermal, structural, air infiltration, water penetration, and sound attenuation criteria.
C. Verify that each component is appropriate for use in structural sealant glazing (SSG) application in regards to at least the following properties; size, shape, dimensions, material, self-life, storage conditions, and color.
D. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with not less than three years of documented experience.
    1. Provide certified glass products through ANSI accredited certifications that include plant audits and independent laboratory performance testing.
        a. Insulating Glass Certification Council (IGCC).
E. Installer Qualifications: Company specializing in performing work of type specified and with at least three years of documented experience.

1.07 MOCK-UPS

A. See Section 01 4000 - Quality Requirements for additional requirements.
B. Provide 10 feet mock-up including each component being used on the project. Assemble to illustrate component assembly including glazing materials, weep drainage system, attachments, anchors, and perimeter sealant.
C. Locate on-site where directed by Architect; mock-up may remain as part of the Work.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Handle products of this section in accordance with AAMA CW-10.
B. Protect finished aluminum surfaces with wrapping. Do not use adhesive papers or sprayed coatings that bond to aluminum when exposed to sunlight or weather.

1.09 FIELD CONDITIONS

A. Do not install sealants when ambient temperature is less than 40 degrees F. Maintain this minimum temperature during and 48 hours after installation.

1.10 WARRANTY

A. See Section 01 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 excessive degradation of exterior finish. Include provision for replacement of units with excessive fading, chalking, or flaking.

D. The Contractor shall guarantee his work for a period of One (1) year from date of Substantial Completion. Guarantee shall be on form included in Section 01 7800.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Basis of Design Manufacturer:
   1. Kawneer Company, Inc: www.kawneer.com.
      a. Products:
         1) Horizontal: 1600UT System; outside glazed pressure plate.
         2) Vertical: 1600UT - SSG System; structural silicone glazed.

B. Other Manufacturers: Subject to compliance with all of the requirements of this section, products by one of the following will be acceptable:
   1. Arcadia, Inc: www.arcadiainc.com.

2.02 CURTAIN WALL

A. Type 1 - Aluminum-Framed Curtain Wall: Factory fabricated, factory finished aluminum framing members with infill, and related flashings, anchorage and attachment devices.
   1. Structural sealant glazing (SSG) adhesive on two (2) sides, with temporary glazing stops, and pressure plate and mullion cover on two (2) sides, where indicated on drawings.
   2. Fabrication Method: Shop.
   3. Glazing Method: Field glazed system.
   4. Mullion Dimensions: 2-1/2 inches wide by 7-1/2 inches deep.
   5. Finish: Class I natural anodized.
      a. Factory finish surfaces that will be exposed in completed assemblies.
      b. Coat concealed metal surfaces that will be in contact with cementitious materials or dissimilar metals with bituminous paint.
         1) Epoxy paint or self adhered waterproof membrane may also be used.
   6. Provide flush joints and corners, weathersealed, accurately fitted and secured; prepared to receive anchors; fasteners and attachments concealed from view; reinforced as required for imposed loads.
   7. Construction: Eliminate noises caused by wind and thermal movement, prevent vibration harmonics, and prevent stack effect in internal spaces.
   8. 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.
   9. Maintain continuous air barrier and/or vapor retarder seal throughout assembly, primarily in line with inside pane of glazing and inner sheet of infill panel and heel bead of glazing compound.
   10. Perimeter Clearance: Minimize space between framing members and adjacent construction while allowing expected movement.
   11. Preparation for Window Treatments: Provide reinforced interior horizontal head rail.

B. Structural Performance Requirements: Design and size components to withstand the following load requirements without damage or permanent set.
   1. Design Wind Loads: Comply with the requirements of the ICC (IBC) Code and ASCE 7.
      a. Measure performance by testing in accordance with ASTM E330/E330M, using test loads equal to 1.5 times the design wind loads and 10 second duration of maximum pressure.
      b. Member Deflection: For spans less than 13 feet 6 inches, limit member deflection to flexure limit of glass in any direction, and maximum of 1/175 of span or 3/4 inch, whichever is less and with full recovery of glazing materials.

c. Member Deflection: For spans over 13 feet 6 inches and less than 40 feet, limit member deflection to flexure limit of glass in any direction, and maximum of 1/240 of span plus 1/4 inch, with full recovery of glazing materials.

2. Seismic Loads: Design and size components to withstand seismic loads and sway displacement in accordance with the requirements of the ICC (IBC) Code and ASCE 7.
3. Interstory Differential Lateral Movement: Meeting pass/fail criteria of {RS#40} for Use Group I, Standard Occupancy, when tested at design displacement of 0.010 times greater adjacent story height, maximum, and 1.5 times design displacement, through three complete cycles.
4. Movement: Accommodate the following movement without damage to components or deterioration of seals:
   a. Expansion and contraction caused by 180 degrees F surface temperature.
   b. Expansion and contraction caused by cycling temperature range of 170 degrees F over a 12 hour period.
   c. Movement of curtain wall relative to perimeter framing.
   d. Deflection of structural support framing, under permanent and dynamic loads.
   e. Shortening of structural concrete columns.
   f. Creep of structural concrete members.
5. Structural Sealant Glazing (SSG) System: For individual glass lites, design framing members to not exceed a deflection normal to the wall of L/175 between supports with 3/4 inch maximum, and a deflection parallel to the wall of L/360 with 1/8 inch maximum, whichever is less.

C. Water Penetration Resistance on Manufactured Assembly: No uncontrolled water on indoor face when tested as follows:
   1. Test Method: AAMA 501.1.
D. Thermal Performance Requirements:
   1. This Contractor/Manufacturer along with Section 08 8000, shall certify that the specified curtainwall/glazing assembly meets or exceeds the Utah Energy Code standards (based on ICC (IECC)) as a part of submittal approval.
      a. Minimum Curtain Wall Assembly Overall Design U-Value: 0.45.
      b. Minimum Curtain Wall Assembly Overall Design Solar Heat Gain Coefficient: 0.26.
E. Acoustical Performance Requirements:
   1. Sound Attenuation: STC of 31 at Captured and 32 at SSG, minimum, from exterior to interior.
   2. Test Method: ASTM E90, with calculation in accordance with ASTM E413.

2.03 COMPONENTS

A. Aluminum Framing Members: Tubular aluminum sections, thermally broken with interior section insulated from exterior, drainage holes and internal weep drainage system.
   1. Framing members for interior applications need not be thermally broken.
   2. Cross-Section: As indicated on drawings.
   3. Structurally Reinforced Members: Extruded aluminum with internal reinforcement of structural steel member.
B. Glazing: As specified in Section 08 8000.

2.04 MATERIALS

A. Sheet Aluminum: ASTM B209/B209M.
B. Structural Steel Sections: ASTM A36/A36M; galvanized in accordance with requirements of ASTM A123/A123M.
C. Structural Supporting Anchors: See Section 05 1200.
D. Structural Supporting Anchors Attached to Structural Steel: Design for bolted attachment.

E. Structural Supporting Anchors Attached to Reinforced Concrete Members: Design for welded attachment to weld plates embedded in concrete.
F. Fasteners: Stainless steel; type as required or recommended by curtain wall manufacturer.
G. Firestopping: See Section 07 8400.
H. Structural Sealant Glazing (SSG) Adhesive: Neutral curing, silicone sealant formulated for SSG applications in compliance with ASTM C1184 and structural glazing industry guidelines, ASTM C1401.
    1. SSG adhesive in compliance with ASTM C920; Type S - Single-component, Grade NS, Class 50, Use NT, G, and A.
    2. Ultimate Tensile Strength: Minimum of 50 psi as determined by test method ASTM C1135 under the following conditions.
        a. Exposure to air temperatures of 190 degrees F and minus 20 degrees F.
        b. Water immersion for seven (7) days, minimum.
        c. Exposure to weathering for 5,000 hours, minimum.
    3. Sealant Design Tensile Strength: 20 psi, maximum.
    4. Hardness: 20 to 60 with Type A-2 durometer in compliance with test method ASTM C661.
    5. SSG sealant tested for compatibility with glazing accessories in compliance with ASTM C1087, tested for accelerated weathering in compliance with ASTM C793, and in compliance with insulating glass secondary sealant design standards of ASTM C1249.
I. Weatherseal Sealant: Silicone, with adhesion in compliance with ASTM C794; compatible with glazing accessories.
J. Perimeter Sealant: Type recommended by manufacturer.
K. Touch-Up Primer for Galvanized Steel Surfaces: SSPC-Paint 20, zinc rich.
L. Aluminum plate panels and back-up attachment angles shall be finished to match curtain wall / storefront system.
M. All required 3/32 inch (3 mm) thick cover plates detailed adjacent to curtain wall framing.

2.05 FINISHES

A. Class I Natural Anodized Finish: AAMA 611 AA-M12C22A41 Clear anodic coating not less than 0.7 mils thick.
B. Touch-Up Materials: As recommended by coating manufacturer for field application.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify dimensions, tolerances, and method of attachment with other related work.
B. Verify that curtain wall openings and adjoining water-resistive and air barrier seal materials are ready to receive work of this section.
C. Verify that anchorage devices have been properly installed and located.

3.02 INSTALLATION

A. Install curtain 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. Install firestopping at each floor slab edge.

H. Pack fibrous insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.
I. Pressure Plate Framing: Install glazing and infill panels using exterior dry glazing method; see Section 08 8000.
J. Structural Sealant Glazing (SSG) Adhesive: Install structural sealant glazing adhesive and weatherseal sealant in accordance with manufacturer's instructions.
K. Install infill panels, refer to drawings.
L. Install perimeter sealant.
M. Touch-up minor damage to factory applied finish; replace components that cannot be satisfactorily repaired.

3.03 TOLERANCES

A. Maximum Variation from Plumb: 0.06 inches every 3 ft non-cumulative or 0.5 inches per 100 ft, whichever is less.
B. Maximum Misalignment of Two Adjoining Members Abutting in Plane: 1/32 inch.
C. Sealant Space Between Curtain Wall Mullions and Adjacent Construction: Maximum of 3/4 inch and minimum of 1/4 inch.

3.04 FIELD QUALITY CONTROL

A. Provide services of curtain wall manufacturer's field representative to observe for proper installation of system and submit report.
B. See Section 01 4000 - Quality Requirements, for independent testing and inspection requirements.
    1. Test installed curtainwall assembly for water leakage in accordance with AAMA 501.2.
C. Repair or replace curtain wall components that have failed designated field testing, and retest to verify performance complies with specified requirements.

3.05 CLEANING

A. Remove protective material from pre-finished aluminum surfaces.
B. Upon completion of installation, thoroughly clean aluminum surfaces in accordance with AAMA 609 & 610.

3.06 PROTECTION

A. Protect installed products from damage until Date of Substantial Completion.

END OF SECTION 08 4413

This page intentionally left blank

SECTION 08 4500

TRANSLUCENT SKYLIGHT PANEL ASSEMBLIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Furnish all labor, materials, equipment, tools and services required to fully complete all Translucent Panel Assembly work as is indicated on the drawings and/or specified herein including, but not limited to, the following described items.
B. Factory prefabricated structural insulated translucent sandwich panels.
C. Aluminum installation system.
D. Aluminum sill flashing.
E. Sealants.
F. Do not include sales tax, refer to Notice to Contractors.

1.02 RELATED REQUIREMENTS

A. Section 05 1200 - Structural Steel Framing.
B. Section 07 6200 - Sheet Metal Flashing and Trim.
C. Section 07 9005 - Joint Sealers.

1.03 REFERENCE STANDARDS

A. AAMA 1503 - Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors and Glazed Wall Sections; 2009.
B. AAMA 2604 - Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels; 2005.
C. ASTM C 297/C 297M - Standard Test Method for Flatwise Tensile Strength of Sandwich Constructions; 2004.
D. ASTM D 635 - Standard Test Method for Rate of Burning and/or Extent and Time of Burning of Plastics in a Horizontal Position; 2006.
E. ASTM D1002 - Standard Test Method for Apparent Shear Strength of Single-Lap-Joint Adhesively Bonded Metal Specimens by Tension Loading (Metal-to-Metal); 2005.
F. ASTM D1037 - Standard Test Methods for Evaluating Properties of Wood-Base Fiber and Particle Panel Materials; 2006a.
G. ASTM D 2244 - Standard Practice for Calculation of Color Differences from Instrumentally Measured Color Coordinates; 2007.
H. ASTM D 4060 - Standard Test Method for Abrasion Resistance of Organic Coatings by the Taber Abraser; 2007.
I. ASTM E 72 - Standard Test Methods of Conducting Strength Tests of Panels for Building Construction; 2005.
J. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2008.
K. FM 4881 - Standard for Class 1 Exterior Wall Systems; 2007.
L. NFRC 100 - Procedures for Determining Fenestration Product U-factors; 2004, with 2005 addendum.
M. UL 723 - Standard for Test for Surface Burning Characteristics of Building Materials; 2008.
N. UL 972 - Standard of Safety for Burglary Resisting Glazing Material; 2008.

1.04 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.

1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide construction details, material descriptions, profiles and finishes of components.
C. Shop Drawings: Include elevations, details and dimensions.
D. Samples: Color charts showing the full range of colors available for factory finished aluminum.
    1. Submit samples for each exposed finish required, in same thickness and material indicated for the work and in size indicated below. If finishes involve normal color variations, include sample sets consisting of two or more units showing the full range of variations expected.
        a. Sandwich panels: 14 inch by 28 inch (356 mm by 711 mm) units.
        b. Factory finished aluminum: 5 inch (127 mm) long sections.
E. Installer Certificate: Submit certificate signed by installer certifying compliance with project qualification requirements.
F. Test Reports: Provide test reports from a qualified independent testing agency indicating each type and class of panel system complies with the project performance requirements, based on comprehensive testing of current products. Previously completed test reports will be acceptable if for current manufacturer and indicative of products used on this project.
    1. Required Reports:
        a. Flame Spread and Smoke Developed (UL 723) - Submit UL Card.
        b. Burn Extent (ASTM D 635).
        c. Color Difference (ASTM D 2244).
        d. Abrasion/Erosion Resistance (ASTM D 4060).
        e. Impact Strength (UL 972).
        f. Bond Tensile Strength (ASTM C 297 after aging by ASTM D 1037).
        g. Bond Sheer Strength (ASTM D 1002).
        h. Beam Bending Strength (ASTM E 72).
        i. Panel Insulation U-Factor (NFRC 100).
        j. NFRC System U-Factor Certification.
        k. Solar Heat Gain Co-efficient.
        l. Condensation Resistance Factor (AAMA 1503).
        m. Class 1 Fire Approval (FM 4881).
G. Quality Control: Submit current documentation indicating regular, independent quality control monitoring under a nationally recognized building code review and listing program.
H. Warranty: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

1.06 QUALITY ASSURANCE

A. Manufacturer Qualifications:
    1. Material and products to be manufactured by a company continuously and regularly employed in the manufacture of specified materials for a period of at least ten (10) consecutive years and which can show evidence of those materials being satisfactorily used on at least six (6) projects of similar size, scope, and location.

2. Panel system must be listed by the International Code Council - Evaluation Service (ICC-ES) which requires quality control inspections and fire, structural and water infiltration testing of sandwich panel systems by an approved agency.
3. Quality control inspections to be conducted at least once each year and shall include manufacturing facilities, sandwich panel components and production sandwich panels for conformance with Acceptance Criteria for Sandwich Panels as regulated by the ICC-ES.

B. Install Qualifications: Installation to be by an experienced installer, which has been in the business of installing specified panels systems for at least two (2) consecutive years and can show evidence of satisfactory completion of projects of similar size, scope, and type.

C. Performance Requirements: The manufacturer shall be responsible for the configuration and fabrication of the complete panel system.
1. When requested, include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
2. System Design: Design and size components to withstand dead loads and live loads caused by snow, hail, and positive and negative wind loads acting on plane of panel without damage or permanent set.
   a. Design Loads: Calculate in accordance with IBC.
   b. Wind Load: 25 lb/sq. ft (1.20 kPa).
   c. Snow Load: 35 lb/sq. ft (1.68 kPa). Verify with Structural.
   d. Measure performance in accordance with ASTM E 330, using test load of 1.5 times the design wind pressure and 10 second duration of maximum load.
3. Seismic Loads: Design and size components to withstand seismic loads and sway displacement as calculated in accordance with IBC.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Deliver panel system, components and materials in manufacturer's standard protective packaging.

B. Store panels on the long edge; several inches above the ground, blocked and under cover in accordance with manufacturer's storage and handling instructions.

1.08 WARRANTY

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

B. Provide manufacturer's and installer's written warranty agreeing to repair or replace panels system work which fails in materials or workmanship within one year after Date of Substantial Completion. Failure of materials or workmanship includes leakage, excessive deflection, deterioration of finish on metal in excess of normal weathering and defects in accessories, insulated translucent sandwich panels and other components of the work.

C. Provide extended warranty for 25 years against fiber exposure, covered by the face sheet manufacturer, non pro rata.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Basis of Design Manufacturer:
1. Kalwall Corporation; Product - Standard S-Line Skylights: www.kalwall.com.

B. Other Approved Manufacturers:
1. Major Industries, Inc: www.majorskylights.com.
2. Substitutions: See Section 01 6000 - Product Requirements.

2.02 PANEL COMPONENTS

A. Face Sheets:

1. Translucent Faces: Manufactured from glass fiber thermoset resins, formulated specifically for architectural use.
    a. Thermoplastic (e.g. polycarbonate, acrylic) faces are not acceptable.
    b. Face sheets shall not deform, deflect or drip when subjected to fire or flame.
    c. Face sheets shall not delaminate when exposed to 200 degrees F for 30 minutes per IBC or 300 degrees F for 25 minutes.
2. Interior Face Sheets:
    a. Flamespread: UL listed, with flamespread rating no greater than 50 and smoke developed no greater than 250 when tested in accordance with UL 723/ASTM E 84.
    b. Burn extent by ASTM D 635 shall be no greater than 1 inch (25 mm).
3. Exterior Face Sheets:
    a. Color Stability: Full thickness of the exterior face sheet shall not change color more than 3.0 CIE Units Delta by ASTM D 2244 after 5 years outdoor South Florida weathering at 5 degrees facing south, determined by the average of at least three white samples with and without protective film or coating to ensure long-term color stability. Color stability shall be unaffected by abrasion or scratching.
    b. Erosion Resistance: Exterior face shall have a permanent glass erosion barrier embedded beneath the surface to provide long-term resistance to reinforcing fiber exposure. Exterior face surface loss shall not exceed 0.7 mils and 40 mgs when tested in accordance with ASTM D 4060 employing CS17 abrasive wheels at a head load of 500 grams for 1000 cycles.
    c. Strength: Exterior face sheet shall be uniform in strength, impenetrable by hand held pencil and repel and impact equal to 70 ft. lbs. without fracture or tear when impacted by a 3 1/4 inch diameter, 5 lb free-falling ball per UL 972.
4. Appearance:
    a. Exterior Face Sheets: Smooth, 0.070 inch (1.8 mm) thick and crystal in color.
    b. Interior Face Sheets: Smooth, 0.045 inch (1.1 mm) thick and white in color.
    c. Face sheets shall not vary more than +/- 10 percent in thickness and be uniform in color.

B. Grid Core:
1. Thermally broken I-beam grid core of 6063-T6 or 6005-T5 alloy and temper with provisions for mechanical interlocking of muntin-mullion and perimeter. Width of I-beam is not to be less than 7/16 inch (11 mm). The I-beam grid shall be machined to tolerances of not greater than +/- 0.002 inch (0.05 mm).
2. I-beam Thermal Break: Minimum 1 inch (25 mm), thermoset. Urethane poured and de-bridged is not acceptable.

C. Laminate Adhesive:
1. Heat and pressure resin type adhesive engineered for structural sandwich panel use. Adhesive shall pass testing requirements specified by the ICC Acceptance Criteria for Sandwich Panel Adhesives.
2. Minimum tensile strength of 750 PSI when the panel assembly is tested by ASTM C 297 after two exposures to six cycles each of the aging conditions prescribed by ASTM D 1037.
3. Minimum shear strength of the panel adhesive by ASTM D 1002 after exposure to five separate conditions:
    a. 50 percent Relative Humidity at 68 degrees F: 540 PSI.
    b. 182 degrees F: 100 PSI.
    c. Accelerated Aging by ASTM D 1037 at room temperature: 800 PSI.
    d. Accelerated Aging by ASTM D 1037 at 182 degrees F: 250 PSI.

2.03 PANEL CONSTRUCTION

A. Provide sandwich panels of flat fiberglass reinforced translucent face sheets laminated to a grid core of mechanically interlocking thermally broken I-beams. The adhesive bonding line shall be straight, cover the entire width of the I-beam and have a neat sharp edge.
   1. Thickness: 2 3/4 inches.
   2. Light Transmission: 20 percent.
   3. Solar Heat Gain Coefficient: 0.28.
   4. Overall Panel U-Factor by NFRC certified Laboratory: 0.23.
   5. Grid Pattern: 12 inches by 24 inches (305 mm by 610 mm) shoji.

B. Panels shall deflect no more than 1.9 inch at 30 psf in 10 foot span without a supporting frame by ASTM E 72.

C. Panels shall show evidence of withstanding 1200 degree F fire for minimum of one hour without collapse or flame penetration.

D. Broken Panels:
   1. Minimum Condensation Resistance Factor of 80 by AAMA 1503 measured on the bond line.
   2. Minimum CRF of 90 at center of grid cell.

2.04 BATTENS AND PERIMETER CLOSURE SYSTEM

A. Closure System: Extruded aluminum 6063-T6 and 6063-T5 alloy and temper clamp-tite screw type closure system.
   1. Thermally broken perimeter system shall have a urethane bridge.

B. Sealing Tape: Manufacturer's standard, pre-applied to closure system at the factory under controlled conditions.

C. Sealants: As recommended by manufacturer.

D. Fasteners: 300 series stainless steel screws for aluminum closures, excluding final fasteners to the building.

E. Finish: Exposed aluminum to be manufacturer's factory applied finish that meets the performance requirements of AAMA 2604.
   1. Custom color as selected by Architect.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine substrates, supporting structure and installation conditions. Do not proceed with panel erection until unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Metal Protection:
   1. Where aluminum will contact dissimilar metals, protect against galvanic action by painting contact surfaces with primer or by applying sealant or tape recommended by manufacturer for this purpose.
   2. Where aluminum will contact concrete or masonry, protect against corrosion by painting contact surfaces with bituminous paint or method recommended by manufacturer.
   3. Where aluminum will contact pressure-treated wood; separate dissimilar materials by methods recommended by manufacturer.

3.03 INSTALLATION

A. Install the panel system in accordance with the manufacturer's installation recommendations and approved shop drawings.

B. Anchor component parts securely in place by permanent mechanical attachment system.
C. Accommodate thermal and mechanical movements.
D. Set perimeter framing in a full bed of sealant compound, or with joint fillers or gaskets to provide weather-tight construction.
E. Install joint sealants at perimeter joint and within panel system in accordance with manufacturer's installation instructions.

3.04 CLEANING

A. Clean the panel system inside and outside, immediately after installation, according to manufacturer's written recommendations.

END OF SECTION 08 4500

SECTION 08 5659

INTERIOR SLIDING SERVICE WINDOW

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Furnish all labor, materials, equipment, tools and services required to fully complete all Interior Sliding Service Window work as is indicated on the drawings and/or specified herein including, but not limited to, the following described items.
B. Interior vertical sliding service window assembly.
C. Service window stainless steel transaction tray.
D. Do not include sales tax, refer to Section 00 0104 - Notice to Contractors.

1.02 RELATED REQUIREMENTS

A. Section 06 6116 - Solid-Surfacing Fabrications - installation of tray.
B. Section 08 8000 - Glazing: Glass and glazing accessories.
C. Section 08 4313 - Aluminum-Framed Storefronts.
D. Section 09 2116 - Gypsum Board Assemblies: Support and blocking for track.

1.03 REFERENCE STANDARDS

A. {RSTEMP#42}
B. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2021.
C. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric); 2021.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordinate work with adjacent materials specified in other sections and as indicated on drawings and approved shop drawings.

1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Product Data: Submit manufacturer's product data for specified products indicating materials, operation, glazing, finishes, and installation instructions.
C. Shop Drawings: Indicate configuration, sizes, rough-in, mounting, anchors and fasteners, and installation clearances.
D. Samples for Selection of Finishes:
    1. Anodized Finishes: Submit two samples, 4 by 4 inches in size illustrating metal finishes for each finish specified.
E. Warranty: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

1.06 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with minimum three years documented experience.
B. Installer Qualifications: Company specializing in performing work of the type specified in this section.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Deliver units in manufacturer's original packaging and unopened containers with identification labels intact.
B. Store units in area protected from exposure to weather and vandalism.

1.08 PROJECT CONDITIONS

A. Field measurements: Check opening by accurate field measurement before fabrication. Show recorded measurements on shop drawings. Coordinate fabrication schedule with construction progress to avoid delay of work.

1.09 WARRANTY

A. The Contractor shall guarantee his work for a period of One (1) years from date of Substantial Completion. Guarantee shall be on form included in Section 01 7800.
B. Provide manufacturer's warranty agreeing to repair or replace units and their components that fail in materials or workmanship within two years from date of Substantial Completion.

PART 2 PRODUCTS

2.01 MATERIALS

A. Aluminum Extrusions: Minimum 1/8 inch thick frame and sash material complying with ASTM B221 andASTM B221M
    1. Finish: Class I natural anodized.

2.02 INTERIOR SLIDING SERVICE WINDOW ASSEMBLY

A. Service Window-Vertical: Factory-fabricated and finished 6063-T5 extruded aluminum frame; complete with hardware and anchors.
    1. Window: Vertical sliding with one lower sliding panel and one fixed upper panel and u
    2. Operation: Manual.
    3. Size: As indicated on drawings.
    4. Finish: Clear satin anodized.
    5. Glazing: Single (monolithic), clear, provided by Section 08 8000.
        a. Laminated safety glazing.
        b. 1/4 inch thick with PBV inner layer.
    6. Lock: Thumb turn on interior side.
    7. Basis of Design Product:
        a. CR Laurence Co, Inc; Model SWB1014A: www.crlaurence.com.
            1) Substitutions: See Section 01 6000 - Product Requirements.

2.03 FINISHES

A. Class II Natural Anodized Finish: {RS#42} AA-M12C22A31 Clear anodic coating not less than 0.4 mils thick.

2.04 SERVICE WINDOW TRAY

A. Manufacturer: CRL; crlauence.com.
B. Size: 16 inches by 10 inches by 1 9/16 inches.
C. Finish: Stainless steel.
D. Model: CTDB16.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that window openings are ready for installation of windows.
B. Verify that correct embedded anchors are in place and in proper location; repair or replace anchors as required to achieve satisfactory installation.
C. Notify Architect if conditions are not suitable for installation of units; do not proceed until conditions are satisfactory.

3.02 INSTALLATION

A. Install in accordance with manufacturer's instructions.
B. Install units in correct orientation (inside/outside or secure/non-secure).
C. Anchor units securely.
D. Separate metal members from concrete and masonry using bituminous paint or with products recommended by the manufacturer for this purpose.
E. Seal perimeter joints as specified in Section 07 9200.

3.03 ADJUSTING

A. Adjust operating components for smooth operation while also maintaining a secure enclosure and a tight fit at the contact points; lubricate operating hardware.

3.04 CLEANING AND PROTECTION

A. Remove protective material from factory finished surfaces.
B. Clean frame and glazing surfaces after installation, complying with requirements contained in the manufacturer’s instructions. Remove excess glazing sealant compounds, dirt or other substances
C. Remove and replace defective work.
D. Provide temporary protection to ensure that service windows are without damage at time of Substantial Completion.

END OF SECTION 08 5659

This page intentionally left blank

SECTION 08 7100

DOOR HARDWARE

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes:

1. Mechanical and electrified door hardware
2. Electronic access control system components

B. Section excludes:

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

C. Related Sections:

1. Division 01 "General Requirements" sections for Allowances, Alternates, Owner Furnished Contractor Installed, Project Management and Coordination.
2. Division 06 Section "Rough Carpentry"
3. Division 06 Section "Finish Carpentry"
4. Division 07 Section "Joint Sealants" for sealant requirements applicable to threshold installation specified in this section.
5. Division 08 Sections:
   a. "Metal Doors and Frames"
   b. "Flush Wood Doors"
   c. "Stile and Rail Wood Doors"
   d. "Interior Aluminum Doors and Frames"
   e. "Aluminum-Framed Entrances and Storefronts"
   f. "Stainless Steel Doors and Frames"
   g. "Special Function Doors"
   h. "Entrances"
6. Division 26 "Electrical" sections for connections to electrical power system and for low-voltage wiring.
7. Division 28 "Electronic Safety and Security" sections for coordination with other components of electronic access control system and fire alarm system.

1.02 REFERENCES

A. UL LLC

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

B. DHI - Door and Hardware Institute

1. Sequence and Format for the Hardware Schedule
2. Recommended Locations for Builders Hardware
3. Keying Systems and Nomenclature
4. Installation Guide for Doors and Hardware

C. NFPA – National Fire Protection Association

1. NFPA 70 – National Electric Code
2. NFPA 80 – 2016 Edition – Standard for Fire Doors and Other Opening Protectives
3. NFPA 101 – Life Safety Code
4. NFPA 105 – Smoke and Draft Control Door Assemblies
5. NFPA 252 – Fire Tests of Door Assemblies

D. ANSI - American National Standards Institute

1. ANSI A117.1 – 2017 Edition – Accessible and Usable Buildings and Facilities
2. ANSI/BHMA A156.1 - A156.29, and ANSI/BHMA A156.31 - Standards for Hardware and Specialties
3. ANSI/BHMA A156.28 - Recommended Practices for Keying Systems
4. ANSI/WDMA I.S. 1A - Interior Architectural Wood Flush Doors
5. ANSI/SDI A250.8 - Standard Steel Doors and Frames

1.03 SUBMITTALS

A. General:

1. Submit in accordance with Conditions of Contract and Division 01 Submittal Procedures.
2. Prior to forwarding submittal:
   a. Review drawings and Sections from related trades to verify compatibility with specified hardware.
   b. Highlight, encircle, or otherwise specifically identify on submittals: deviations from Contract Documents, issues of incompatibility or other issues which may detrimentally affect the Work.

B. Action Submittals:

1. Product Data: Submit technical product data for each item of door hardware, installation instructions, maintenance of operating parts and finish, and other information necessary to show compliance with requirements.
2. Riser and Wiring Diagrams: After final approval of hardware schedule, submit details of electrified door hardware, indicating:
   a. Wiring Diagrams: For power, signal, and control wiring and including:
      1) Details of interface of electrified door hardware and building safety and security systems.
      2) Schematic diagram of systems that interface with electrified door hardware.
      3) Point-to-point wiring.
      4) Risers.

3. Samples for Verification: If requested by Architect, submit production sample of requested door hardware unit in finish indicated and tagged with full description for coordination with schedule.

a. Samples will be returned to supplier. Units that are acceptable to Architect may, after final check of operations, be incorporated into Work, within limitations of key coordination requirements.

4. Door Hardware Schedule:
   a. Submit concurrent with submissions of Product Data, Samples, and Shop Drawings. Coordinate submission of door hardware schedule with scheduling requirements of other work to facilitate fabrication of other work critical in Project construction schedule.
   b. Submit under direct supervision of a Door Hardware Institute (DHI) certified Architectural Hardware Consultant (AHC) or Door Hardware Consultant (DHC) with hardware sets in vertical format as illustrated by Sequence of Format for the Hardware Schedule published by DHI.
   c. Indicate complete designations of each item required for each opening, include:
      1) Door Index: door number, heading number, and Architect's hardware set number.
      2) Quantity, type, style, function, size, and finish of each hardware item.
      3) Name and manufacturer of each item.
      4) Fastenings and other pertinent information.
      5) Location of each hardware set cross-referenced to indications on Drawings.
      6) Explanation of all abbreviations, symbols, and codes contained in schedule.
      7) Mounting locations for hardware.
      8) Door and frame sizes and materials.
      9) Degree of door swing and handing.
      10) Operational Description of openings with electrified hardware covering egress, ingress (access), and fire/smoke alarm connections.

5. Key Schedule:
   a. After Keying Conference, provide keying schedule that includes levels of keying, explanations of key system's function, key symbols used, and door numbers controlled.
   b. Use ANSI/BHMA A156.28 "Recommended Practices for Keying Systems" as guideline for nomenclature, definitions, and approach for selecting optimal keying system.
   c. Provide 3 copies of keying schedule for review prepared and detailed in accordance with referenced DHI publication. Include schematic keying diagram and index each key to unique door designations.
   d. Index keying schedule by door number, keyset, hardware heading number, cross keying instructions, and special key stamping instructions.
   e. Provide one complete bitting list of key cuts and one key system schematic illustrating system usage and expansion. Forward bitting list, key cuts and key system schematic directly to Owner, by means as directed by Owner.
   f. Prepare key schedule by or under supervision of supplier, detailing Owner's final keying instructions for locks.

C. Informational Submittals:

1. Provide Qualification Data for Supplier, Installer and Architectural Hardware Consultant.
2. Provide Product Data:
   a. Certify that door hardware approved for use on types and sizes of labeled fire-rated doors complies with listed fire-rated door assemblies.
   b. Include warranties for specified door hardware.

D. Closeout Submittals:

1. Operations and Maintenance Data: Provide in accordance with Division 01 and include:

a. Complete information on care, maintenance, and adjustment; data on repair and replacement parts, and information on preservation of finishes.
b. Catalog pages for each product.
c. Final approved hardware schedule edited to reflect conditions as installed.
d. Final keying schedule
e. Copy of warranties including appropriate reference numbers for manufacturers to identify project.
f. As-installed wiring diagrams for each opening connected to power, both low voltage and 110 volts.

E. Inspection and Testing:

1. Submit written reports to the Owner and Authority Having Jurisdiction (AHJ) of the results of functional testing and inspection for:
   a. Fire door assemblies, in compliance with NFPA 80.
   b. Required egress door assemblies, in compliance with NFPA 101.

1.04 QUALITY ASSURANCE

A. Qualifications and Responsibilities:

1. Supplier: Recognized architectural hardware supplier with a minimum of 5 years documented experience supplying both mechanical and electromechanical door hardware similar in quantity, type, and quality to that indicated for this Project. Supplier to be recognized as a factory direct distributor by the manufacturer of the primary materials with a warehousing facility in the Project's vicinity. Supplier to have on staff, a certified Architectural Hardware Consultant (AHC) or Door Hardware Consultant (DHC) available to Owner, Architect, and Contractor, at reasonable times during the Work for consultation.
2. Installer: Qualified tradesperson skilled in the application of commercial grade hardware with experience installing door hardware similar in quantity, type, and quality as indicated for this Project.
3. Architectural Hardware Consultant: Person who is experienced in providing consulting services for door hardware installations that are comparable in material, design, and extent to that indicated for this Project and meets these requirements:
   a. For door hardware: DHI certified AHC or DHC.
   b. Can provide installation and technical data to Architect and other related subcontractors.
   c. Can inspect and verify components are in working order upon completion of installation.
   d. Capable of producing wiring diagram and coordinating installation of electrified hardware with Architect and electrical engineers.

4. Single Source Responsibility: Obtain each type of door hardware from single manufacturer.

B. Certifications:

1. Fire-Rated Door Openings:
   a. Provide door hardware for fire-rated openings that complies with NFPA 80 and requirements of authorities having jurisdiction.
   b. Provide only items of door hardware that are listed products tested by UL LLC, Intertek Testing Services, or other testing and inspecting organizations acceptable to authorities having jurisdiction for use on types and sizes of doors indicated, based on testing at positive pressure and according to NFPA 252 or UL 10C and in compliance with requirements of fire-rated door and door frame labels.

2. Smoke and Draft Control Door Assemblies:
   a. Provide door hardware that meets requirements of assemblies tested according to UL 1784 and installed in compliance with NFPA 105
   b. Comply with the maximum air leakage of 0.3 cfm/sq. ft. (3 cu. m per minute/sq. m) at tested pressure differential of 0.3-inch wg (75 Pa) of water.

3. Electrified Door Hardware
   a. Listed and labeled as defined in NFPA 70, Article 100, by testing agency acceptable to authorities having jurisdiction.

4. Accessibility Requirements:
   a. Comply with governing accessibility regulations cited in "REFERENCES" article 087100, 1.02.D3 herein for door hardware on doors in an accessible route. This project must comply with all Federal Americans with Disability Act regulations and all Local Accessibility Regulations.

C. Pre-Installation Meetings

1. Keying Conference
   a. Incorporate keying conference decisions into final keying schedule after reviewing door hardware keying system including:
      1) Function of building, flow of traffic, purpose of each area, degree of security required, and plans for future expansion.
      2) Preliminary key system schematic diagram.
      3) Requirements for key control system.
      4) Requirements for access control.
      5) Address for delivery of keys.

2. Pre-installation Conference
   a. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
   b. Inspect and discuss preparatory work performed by other trades.
   c. Inspect and discuss electrical roughing-in for electrified door hardware.
   d. Review sequence of operation for each type of electrified door hardware.
   e. Review required testing, inspecting, and certifying procedures.
   f. Review questions or concerns related to proper installation and adjustment of door hardware.

3. Electrified Hardware Coordination Conference:
   a. Prior to ordering electrified hardware, schedule and hold meeting to coordinate door hardware with security, electrical, doors and frames, and other related suppliers.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Inventory door hardware on receipt and provide secure lock-up for hardware delivered to Project site. Promptly replace products damaged during shipping.

B. Tag each item or package separately with identification coordinated with final door hardware schedule, and include installation instructions, templates, and necessary fasteners with each item or package. Deliver each article of hardware in manufacturer's original packaging.

C. Maintain manufacturer-recommended environmental conditions throughout storage and installation periods.

D. Provide secure lock-up for door hardware delivered to Project. Control handling and installation of hardware items so that completion of Work will not be delayed by hardware losses both before and after installation.

E. Handle hardware in manner to avoid damage, marring, or scratching. Correct, replace or repair products damaged during Work. Protect products against malfunction due to paint, solvent, cleanser, or any chemical agent.

F. Deliver keys to manufacturer of key control system for subsequent delivery to Owner.

1.06 COORDINATION

A. Coordinate layout and installation of floor-recessed door hardware with floor construction. Cast anchoring inserts into concrete.

B. Installation Templates: Distribute for doors, frames, and other work specified to be factory or shop prepared. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements.

C. Security: Coordinate installation of door hardware, keying, and access control with Owner's security consultant.

D. Electrical System Roughing-In: Coordinate layout and installation of electrified door hardware with connections to power supplies and building safety and security systems.

1.07 WARRANTY

A. Manufacturer's standard form in which manufacturer agrees to repair or replace components of door hardware that fail in materials or workmanship within published warranty period.

1. Warranty does not cover damage or faulty operation due to improper installation, improper use or abuse.
2. Warranty Period: Beginning from date of Substantial Completion, for durations indicated in manufacturer's published listings.
    a. Mechanical Warranty
        1) Locks
            a) Schlage ND Series: 10 years
        2) Exit Devices
            a) Von Duprin: 10 years
        3) Closers
            a) LCN 4000 Series: 30 years
        4) Automatic Operators
            a) LCN: 2 years
    b. Electrical Warranty
        1) Locks
            a) Schlage: 3 years
        2) Exit Devices
            a) Von Duprin: 3 years

1.08 MAINTENANCE

A. Furnish complete set of special tools required for maintenance and adjustment of hardware, including changing of cylinders.

B. Turn over unused materials to Owner for maintenance purposes.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. The Owner requires use of certain products for their unique characteristics and project suitability to ensure continuity of existing and future performance and maintenance standards. After investigating available product offerings, the Awarding Authority has elected to prepare proprietary specifications. These products are specified with the notation: "No Substitute."

1. Where "No Substitute" is noted, submittals and substitution requests for other products will not be considered.

B. Approval of alternate manufacturers and/or products other than those listed as "Scheduled Manufacturer" or "Acceptable Manufacturers" in the individual article for the product category are only to be considered by official substitution request in accordance with section 01 25 00.

C. Approval of products from manufacturers indicated in "Acceptable Manufacturers" is contingent upon those products providing all functions and features and meeting all requirements of scheduled manufacturer's product.

D. Where specified hardware is not adaptable to finished shape or size of members requiring hardware, furnish suitable types having same operation and quality as type specified, subject to Architect's approval.

2.02 MATERIALS

A. Fabrication

1. Provide door hardware manufactured to comply with published templates generally prepared for machine, wood, and sheet metal screws. provide screws according to manufacturer's recognized installation standards for application intended.
2. Finish exposed screws to match hardware finish, or, if exposed in surfaces of other work, to match finish of this other work including prepared for paint surfaces to receive painted finish.
3. Provide concealed fasteners wherever possible for hardware units exposed when door is closed. Coordinate with "Metal Doors and Frames", "Flush Wood Doors", "Stile and Rail Wood Doors" to ensure proper reinforcements. Advise the Architect where visible fasteners, such as thru bolts, are required.

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

1. Where fasteners are exposed to view: Finish to match adjacent door hardware material.

C. Cable and Connectors:

1. Where scheduled in the hardware sets, provide each item of electrified hardware and wire harnesses with number and gage of wires enough to accommodate electric function of specified hardware.
2. Provide Molex connectors that plug directly into connectors from harnesses, electric locking and power transfer devices.
3. Provide through-door wire harness for each electrified locking device installed in a door and wire harness for each electrified hinge, electrified continuous hinge, electrified pivot, and electric power transfer for connection to power supplies.

2.03 HINGES

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product:
   a. Ives 5BB series

B. Requirements:

1. Provide hinges conforming to ANSI/BHMA A156.1.
2. Provide five knuckle, ball bearing hinges.
3. 1-3/4 inch (44 mm) thick doors, up to and including 36 inches (914 mm) wide:
   a. Exterior: Standard weight, bronze or stainless steel, 4-1/2 inches (114 mm) high
   b. Interior: Standard weight, steel, 4-1/2 inches (114 mm) high
4. 1-3/4 inch (44 mm) thick doors over 36 inches (914 mm) wide:
   a. Exterior: Heavy weight, bronze/stainless steel, 5 inches (127 mm) high
   b. Interior: Heavy weight, steel, 5 inches (127 mm) high
5. 2 inches or thicker doors:
   a. Exterior: Heavy weight, bronze or stainless steel, 5 inches (127 mm) high
   b. Interior: Heavy weight, steel, 5 inches (127 mm) high
6. Adjust hinge width for door, frame, and wall conditions to allow proper degree of opening.
7. Provide three hinges per door leaf for doors 90 inches (2286 mm) or less in height, and one additional hinge for each 30 inches (762 mm) of additional door height.
8. Hinge Pins: Except as otherwise indicated, provide hinge pins as follows:
   a. Steel Hinges: Steel pins
   b. Non-Ferrous Hinges: Stainless steel pins
   c. Out-Swinging Exterior Doors: Non-removable pins
   d. Out-Swinging Interior Lockable Doors: Non-removable pins
   e. Interior Non-lockable Doors: Non-rising pins
9. Provide hinges with electrified options as scheduled in the hardware sets. Provide with number and gage of wires enough to accommodate electric function of specified hardware. Locate electric hinge at second hinge from bottom or nearest to electrified locking component. Provide mortar guard for each electrified hinge specified.

2.04 CONTINUOUS HINGES

A. Manufacturers:

1. Scheduled Manufacturer:
   a. Ives

B. Requirements:

1. Provide aluminum geared continuous hinges conforming to ANSI/BHMA A156.26, Grade 1.
2. Provide aluminum geared continuous hinges, where specified in the hardware sets, fabricated from 6063-T6 aluminum.
3. Provide split nylon bearings at each hinge knuckle for quiet, smooth, self-lubricating operation.
4. Provide hinges capable of supporting door weights up to 450 pounds, and successfully tested for 1,500,000 cycles.
5. On fire-rated doors, provide aluminum geared continuous hinges classified for use on rated doors by testing agency acceptable to authority having jurisdiction.
6. Provide aluminum geared continuous hinges with electrified option scheduled in the hardware sets. Provide with number and gage of wires enough to accommodate electric function of specified hardware.
7. Provide hinges 1 inch (25 mm) shorter in length than nominal height of door, unless otherwise noted or door details require shorter length and with symmetrical hole pattern.

2.05 ELECTRIC POWER TRANSFER

A. Manufacturers:

1. Scheduled Manufacturer and Product:
   a. Von Duprin EPT-10

2. Acceptable Manufacturers and Products:
   a. No Substitute

B. Requirements:

1. Provide power transfer with electrified options as scheduled in the hardware sets. Provide with number and gage of wires enough to accommodate electric function of specified hardware.
2. Locate electric power transfer per manufacturer's template and UL requirements, unless interference with operation of door or other hardware items.

2.06 FLUSH BOLTS

A. Manufacturers:

1. Scheduled Manufacturer:
   a. Ives

2. Acceptable Manufacturers:
   a. Rockwood

B. Requirements:

1. Provide automatic, constant latching, and manual flush bolts with forged bronze or stainless-steel face plates, extruded brass levers, and with wrought brass guides and strikes. Provide 12 inch (305 mm) steel or brass rods at doors up to 90 inches (2286 mm) in height. For doors over 90 inches (2286 mm) in height increase top rods by 6 inches (152 mm) for each additional 6 inches (152 mm) of door height. Provide dust-proof strikes at each bottom flush bolt.

2.07 COORDINATORS

A. Manufacturers:

1. Scheduled Manufacturer:
   a. Ives

2. Acceptable Manufacturers:
   a. Rockwood

B. Requirements:

1. Where pairs of doors are equipped with automatic flush bolts, an astragal, or other hardware that requires synchronized closing of the doors, provide bar-type coordinating device, surface applied to underside of stop at frame head.
2. Provide filler bar of correct length for unit to span entire width of opening, and appropriate brackets for parallel arm door closers, surface vertical rod exit device strikes, or other stop mounted hardware. Factory-prepared coordinators for vertical rod devices as specified.

2.08 CYLINDRICAL LOCKS – GRADE 1

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product:
   a. Schlage ND series

2. Acceptable Manufacturers and Products:
   a. Sargent

B. Requirements:

1. Provide cylindrical locks conforming to ANSI/BHMA A156.2 Series 4000, Grade 1, and UL Listed for 3-hour fire doors.
2. Indicators: Where specified, provide escutcheon with lock status indicator window on top of lockset rose:
   a. Escutcheon height (including rose) 6.05 inches high by 3.68 inches wide.
   b. Indicator window measuring a minimum 3.52-inch by .60 inch with 1.92 square-inches of front facing viewing area and 180-degree visibility with a total of .236 square-inches of total viewable area.
   c. Provide snap-in serviceable window to prevent tampering. Lock must function if indicator is compromised.
   d. Provide messages color-coded with full text and symbol, as scheduled, for easy visibility.
   e. Unlocked and Unoccupied message will display on white background, and Locked and Occupied message will display on red background.
3. Cylinders: Refer to "KEYING" article, herein.
4. Provide locks with standard 2-3/4 inches (70 mm) backset, unless noted otherwise, with 1/2-inch latch throw. Provide proper latch throw for UL listing at pairs.
5. Provide locksets with separate anti-rotation thru-bolts, and no exposed screws.
6. Provide independently operating levers with two external return spring cassettes mounted under roses to prevent lever sag.
7. Provide standard ASA strikes unless extended lip strikes are necessary to protect trim.
8. Provide electrified options as scheduled in the hardware sets.

9. Lever Trim: Solid cast levers without plastic inserts and wrought roses on both sides.
   a. Vandlgard: Provide levers with vandal resistant technology for use at heavy traffic or abusive applications.
   b. Lever Design: RHO

2.09 PADLOCKS:

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product:
   a. Schlage KS Series

B. Requirements:

1. Provide padlocks with 1-inch (25 mm) shackle height, unless noted otherwise, as specified.
2. Cylinders: Refer to "KEYING" article, herein.

2.10 EXIT DEVICES

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product:
   a. Von Duprin 98/35A series

2. Acceptable Manufacturers and Products:
   a. Sargent 80 series

B. Requirements:

1. Provide exit devices tested to ANSI/BHMA A156.3 Grade 1 and UL listed for Panic Exit or Fire Exit Hardware.
2. Cylinders: Refer to "KEYING" article, herein.
3. Provide smooth touchpad type exit devices, fabricated of brass, bronze, stainless steel, or aluminum, plated to standard architectural finishes to match balance of door hardware.
4. Touchpad must extend a minimum of one half of door width. No plastic inserts are allowed in touchpads.
5. Provide exit devices with deadlatching feature for security and for future addition of alarm kits and/or other electrified requirements.
6. Provide exit devices with weather resistant components that can withstand harsh conditions of various climates and corrosive cleaners used in outdoor pool environments.
7. Provide flush end caps for exit devices.
8. Provide exit devices with manufacturer's approved strikes.
9. Provide exit devices cut to door width and height. Install exit devices at height recommended by exit device manufacturer, allowable by governing building codes, and approved by Architect.
10. Mount mechanism case flush on face of doors or provide spacers to fill gaps behind devices. Where glass trim or molding projects off face of door, provide glass bead kits.
11. Provide cylinder or hex-key dogging as specified at non fire-rated openings.
12. Removable Mullions: 2 inches (51 mm) x 3 inches (76 mm) steel tube. Where scheduled as keyed removable mullion, provide type that can be removed by use of a keyed cylinder, which is self-locking when re-installed.
13. Provide factory drilled weep holes for exit devices used in full exterior application, highly corrosive areas, and where noted in hardware sets.

14. Provide electrified options as scheduled.
15. Top latch mounting: double- or single-tab mount for steel doors, face mount for aluminum doors eliminating requirement of tabs, and double tab mount for wood doors.
16. Provide exit devices with optional trim designs to match other lever and pull designs used on the project.
17. Special Options:
    a. SI
        1) Provide dogging indicators for visible indication of dogging status.
    b. XP
        1) Rim Exit Devices: provide devices with non-tapered smart latchbolt with 90° latchbolt to strike engagement under stress and Static Load Resistance of 2000 pounds.
    c. QM
        1) Rim Exit Devices: provide devices with damper-controlled re-latching to reduce operational noise. Where lever trim is specified, provide damper controlled lever return.
    d. HH
        1) Provide wind and impact rated hurricane exit devices and mullions certified to comply with Florida Building Code (FBC) TAS 201, 202, 203.
    e. HW
        1) Provide wind rated hurricane exit devices and mullions certified to comply with ANSI-ASTM E330.
    f. CX
        1) Provide delayed egress devices, where scheduled, that are UL 294 listed, meet National Fire Protection Association (NFPA) and International Building Code (IBC) governing delayed egress, and/or other local and national fire codes acceptable to authority having jurisdiction as required.
            a) Provide non-handed and field sizable device with 3/4 (19mm) throw deadlocking latch bolt. Device incorporates an internal RX switch that detects attempt to exit from applying less than 15lbs to the push pad, which causes this switch to start an irreversible alarm cycle. Key switch in device is capable of arming, disarming, or resetting the device; and indicator lamp determines status of the device.
            b) Provide devices capable of standard 15 second release delay and indefinite release delay as required by code, when tied into fire alarm system will release immediately when an alarm condition exists.
            c) Provide devices with all control inputs – door position input, external inhibit input, fire alarm input; auxiliary locking; nuisance alarm and internal horn; and, remote signaling output self-contained in the device assembly.
    g. CVC
        1) Provide cable-actuated concealed vertical latch system in two-point for non-rated or fire rated wood doors up to a 90 minute rating and less bottom latch (LBL) configuration for non-rated or fire rated wood doors up to 20 minute rating. Vertical rods not permitted.
            a) Cable: Stainless steel with abrasive resistant coating. Conduit and core wire ends snap into latch and center slides without use of tools.
            b) Wood Door Prep: Maximum 1 inch x 1.1875 inch x 3.875 inches top latch pocket and 1 inch x 1.1875 inch x 5 inches bottom latch pocket which does not require the use of a metal wrap or edge for non-rated or fire rated wood doors up to a 45 minute rating.
            c) Latchbolts and Blocking Cams: Manufactured from sintered metal low carbon copper- infiltrated steel, with molybdenum disulfide low friction coating.
            d) Top Latchbolt: Minimum 0.38 inch (10 mm) and greater than 90-degree engagement with strike to prevent door and frame separation under high static load.
            e) Bottom Latchbolt: Minimum of 0.44-inch (11 mm) engagement with strike.

f) Product Cycle Life: 1,000,000 cycles.
g) Latch Operation: Top and bottom latch operate independently of each other. Top latch fully engages top strike even when bottom latch is compromised. Separate trigger mechanisms not permitted.
h) Latch release does not require separate trigger mechanism.
i) Cable and latching system characteristics:
   i. Installed independently of exit device installation, and capable of functioning on door prior to device and trim installation.
   ii. Connected to exit device at single point in steel and aluminum doors, and two points for top and bottom latches in wood doors.
   iii. Bottom latch height adjusted, from single point for steel and aluminum doors and two points for wood doors, after system is installed and connected to exit device, while door is hanging
   iv. Bottom latch position altered up and down minimum of 2 inches (51 mm) in steel and aluminum doors without additional adjustment. Bottom latch deadlocks in every adjustment position in wood doors.
   v. Top and bottom latches in steel and aluminum doors and top latch in wood doors may be removed while door is hanging.

2.11 EXIT DEVICES

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product:
   a. Von Duprin 98/99 Series Outdoor Defense

B. Requirements:

1. Exit device must be designed to perform in outdoor conditions, and engineered to safeguard against moisture, temperature variations, and corrosion.
2. Provide exit devices with weather resistant components that can withstand harsh conditions of various climates and corrosive cleaners used in outdoor pool environments.
3. Provide Outdoor Defense exit devices for use in full exterior application, highly corrosive areas, and where noted in hardware sets.
4. Provide Outdoor Defense exit devices in Rim or Surface Vertical Rod configuration.
5. Provide exit devices tested to ANSI/BHMA A156.3 Grade 1 and UL listed for Panic Exit or Fire Exit Hardware[LE1] .
6. Cylinders: Refer to “KEYING” article, herein.
7. Provide smooth or touchpad type exit devices, fabricated of brass, bronze, stainless steel, or aluminum, plated to standard architectural finishes to match balance of door hardware.
8. Touchpad must extend a minimum of one half of door width. No plastic inserts are allowed in touchpads.
9. Provide exit devices with dead-latching feature for security and for future addition of alarm kits and/or other electrified requirements.
10. Provide flush end caps for exit devices.
11. Provide exit devices with manufacturer’s approved strikes.
12. Provide exit devices cut to door width and height. Install exit devices at height recommended by exit device manufacturer, allowable by governing building codes, and approved by Architect.
13. Mount mechanism case flush on face of doors or provide spacers to fill gaps behind devices. Where glass trim or molding projects off face of door, provide glass bead kits.
14. Provide cylinder or hex-key dogging as specified at non fire-rated openings.

15. Removable Mullions: 2 inches (51 mm) x 3 inches (76 mm) steel tube. Where scheduled as keyed removable mullion, provide type that can be removed by use of a keyed cylinder, which is self-locking when re-installed.
16. Top latch mounting: double- or single-tab mount for steel doors, face mount for aluminum doors eliminating requirement of tabs, and double tab mount for wood doors.
17. Provide exit devices with optional trim designs to match other lever and pull designs used on the project.

C. Outdoor Defense Features:

1. Designed to perform in a variety of outdoor conditions, and utilize a series of tests to ensure performance as intended in outdoor applications.
   a. Temperature range: -31 degrees Fahrenheit (-35 degrees Celsius) to 151 degrees Fahrenheit (66 degrees Celsius).
      1) Evaluated per UL294 Section 81 Variable Ambient Test
      2) Evaluated per UL1034 Section 34.2 Variable Ambient Test
   b. Moisture Resistance: Rain tested at 4.8 gallons per minute
      1) Per UL294 Section 79
      2) Per UL1034 Section 53
   c. Corrosion Resistance: Salt Fog Tested per
      1) UL294 Section 83.2 Salt Spray (5% salt concentration)
      2) UL1034 Section 52 Salt Spray Corrosion Test (20% salt concentration)
   d. Dust Resistance: Dust Tested per
      1) UL294 Section 80 Dust Test
      2) UL1034 Section 54 Dust Test

D. Electrified Options (provide as scheduled):

1. Electrified options must be engineered to perform in outdoor conditions and must be warrantied for humidity, rain, and temperature.
   a. CX: Provide delayed egress devices, where scheduled, that are UL 294 listed, meet National Fire Protection Association (NFPA) and International Building Code (IBC) governing delayed egress, and/or other local and national fire codes acceptable to authority having jurisdiction as required.
      1) Provide non-handed and field sizable device with 3/4 (19mm) throw deadlocking latch bolt. Device incorporates an internal RX switch that detects attempt to exit from applying less than 15lbs to the push pad, which causes this switch to start an irreversible alarm cycle. Key switch in device is capable of arming, disarming, or resetting the device; and indicator lamp determines status of the device
      2) Provide devices capable of standard 15 second release delay and indefinite release delay as required by code, when tied into fire alarm system will release immediately when an alarm condition exists.
      3) Provide devices with all control inputs – door position input, external inhibit input, fire alarm input; auxiliary locking; nuisance alarm and internal horn; and, remote signaling output self-contained in the device assembly.
   b. QEL Option, quiet electric latch retraction
   c. ALK Option, alarm kit
   d. LX Option, latch bolt monitoring
   e. RX Option, request to exit switch
   f. WH Option, weep holes

E. Warranty: Outdoor defense exit devices are warranties for 10 years for mechanical and 3 years for electro-mechanical from the date of shipment from the factory.

2.12 CYLINDERS

A. Manufacturers:

1. Scheduled Manufacturer and Product:
   a. Schlage Everest T. No Substitution
   b. Cylindrical Locksets KIL
   c. Panic Exit Trim FSIC

2. Provide cylinders/cores to match Owner's existing key system, compliant with ANSI/BHMA A156.5; latest revision; cylinder face finished to match lockset, manufacturer's series as indicated. Refer to "KEYING" article, herein.

2.13 KEYING

A. Scheduled System:

1. New factory registered system:
   a. Provide a factory registered keying system, complying with guidelines in ANSI/BHMA A156.28, incorporating decisions made at keying conference.

2. Existing factory registered system:
   a. Provide cylinders/cores keyed into Owner's existing factory registered keying system. Comply with guidelines in ANSI/BHMA A156.28, incorporating decisions made at keying conference.

3. Existing non-factory registered system:
   a. Provide cylinders/cores keyed into Owner's existing keying system managed by Owner's locksmith, complying with guidelines in ANSI/BHMA A156.28, incorporating decisions made at keying conference. Contact:
      1) Firm Name:
      2) Contact Person:
      3) Telephone:

B. Requirements:

1. Construction Keying:
   a. Temporary Construction Cylinder Keying.
      1) Provide construction cores that permit voiding construction keys without cylinder removal, furnished in accordance with the following requirements.
         a) Split Key or Lost Ball Construction Keying System.
         b) 3 construction control keys, and extractor tools or keys as required to void construction keying.
         c) 12 construction change (day) keys.
      2) Owner or Owner's Representative will void operation of temporary construction keys.
   b. Replaceable Construction Cores.
      1) Provide temporary construction cores replaceable by permanent cores, furnished in accordance with the following requirements.
         a) 3 construction control keys
         b) 12 construction change (day) keys.
      2) Owner or Owner's Representative will replace temporary construction cores with permanent cores.

2. Permanent Keying:

a. Provide permanent cylinders/cores keyed by the manufacturer according to the following key system.
   1) Master Keying system as directed by the Owner.
b. Forward bitting list and keys separately from cylinders, by means as directed by Owner. Failure to comply with forwarding requirements will be cause for replacement of cylinders/cores involved at no additional cost to Owner.
c. Provide keys with the following features:
   1) Material: Nickel silver; minimum thickness of .107-inch (2.3mm)
   2) Patent Protection: Keys and blanks protected by one or more utility patent(s).
   3) Geographically Exclusive: Where High Security or Security cylinders/cores are indicated, provide nationwide, geographically exclusive key system complying with the following restrictions.
d. Identification:
   1) Mark permanent cylinders/cores and keys with applicable blind code for identification. Do not provide blind code marks with actual key cuts.
   2) Identification stamping provisions must be approved by the Architect and Owner.
   3) Stamp cylinders/cores and keys with Owner's unique key system facility code as established by the manufacturer; key symbol and embossed or stamped with "DO NOT DUPLICATE" along with the "PATENTED" or patent number to enforce the patent protection.
   4) Failure to comply with stamping requirements will be cause for replacement of keys involved at no additional cost to Owner.
   5) Forward permanent cylinders/cores to Owner, separately from keys, by means as directed by Owner.
e. Quantity: Furnish in the following quantities.
   1) Permanent Control Keys: 3.
   2) Master Keys: 6.
   3) Change (Day) Keys: 3 per cylinder/core that is keyed differently
   4) Key Blanks: Quantity as determined in the keying meeting.

2.14 KEY CONTROL SYSTEM

A. Manufacturers:

1. Scheduled Manufacturer:
   a. Telkee

2. Acceptable Manufacturers:
   a. HPC
   b. Lund

B. Requirements:

1. Provide key control system, including envelopes, labels, tags with self-locking key clips, receipt forms, 3-way visible card index, temporary markers, permanent markers, and standard metal cabinet, all as recommended by system manufacturer, with capacity for 150% of number of locks required for Project.
   a. Provide complete cross index system set up by hardware supplier, and place keys on markers and hooks in cabinet as determined by final key schedule.
   b. Provide hinged-panel type cabinet for wall mounting.

2.15 DOOR CLOSERS

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product:
   a. LCN 4040XP series

2. Acceptable Manufacturers and Products:
   a. Norton

B. Requirements:

1. Provide door closers conforming to ANSI/BHMA A156.4 Grade 1 requirements by BHMA certified independent testing laboratory. ISO 9000 certify closers. Stamp units with date of manufacture code.
2. Provide door closers with fully hydraulic, full rack and pinion action with high strength cast iron cylinder, and full complement bearings at shaft.
3. Cylinder Body: 1-1/2-inch (38 mm) diameter piston with 5/8-inch (16 mm) diameter double heat-treated pinion journal. QR code with a direct link to maintenance instructions.
4. Hydraulic Fluid: Fireproof, passing requirements of UL10C, and requiring no seasonal closer adjustment for temperatures ranging from 120 degrees F to -30 degrees F.
5. Spring Power: Continuously adjustable over full range of closer sizes, and providing reduced opening force as required by accessibility codes and standards. Provide snap-on cover clip, with plastic covers, that secures cover to spring tube.
6. Hydraulic Regulation: By tamper-proof, non-critical valves, with separate adjustment for latch speed, general speed, and backcheck. Provide graphically labelled instructions on the closer body adjacent to each adjustment valve. Provide positive stop on reg valve that prevents reg screw from being backed out.
7. Provide closers with solid forged steel main arms and factory assembled heavy-duty forged forearms for parallel arm closers.
8. Pressure Relief Valve (PRV) Technology: Not permitted.
9. Finish for Closer Cylinders, Arms, Adapter Plates, and Metal Covers: Powder coating finish which has been certified to exceed 100 hours salt spray testing as described in ANSI Standard A156.4 and ASTM B117, or has special rust inhibitor (SRI).
10. Provide special templates, drop plates, mounting brackets, or adapters for arms as required for details, overhead stops, and other door hardware items interfering with closer mounting.
11. Closers shall be capable of being upgraded by adding modular mechanical or electronic components in the field.

2.16 ELECTROMECHANICAL CLOSER/HOLDERS

A. Manufacturers:

1. Scheduled Manufacturer:
   a. LCN

2. Acceptable Manufacturers:
   a. Norton

B. Requirements:

1. Provide single-point or multi-point hold-open electromechanical closer/holders as specified. Coordinate voltage requirements and provide transformer if necessary.
2. Provide closer/holders that function as full rack and pinion door closer when current is interrupted or continuous hold-open is not engaged.
3. Provide door closers with fully hydraulic, full rack and pinion action with high strength cylinder and full complement bearings at shaft.

4. Hydraulic Fluid: Fireproof, passing requirements of UL10C, and requiring no seasonal closer adjustment for temperatures ranging from 120 degrees F to -30 degrees F.
5. Spring Power: Continuously adjustable over full range of closer sizes, and providing reduced opening force as required by accessibility codes and standards.
6. Hydraulic Regulation: By tamper-proof, non-critical valves, with separate adjustment for latch speed, general speed, and backcheck.
7. Pressure Relief Valve (PRV) Technology: Not permitted.
8. Provide special templates, drop plates, mounting brackets, or adapters for arms as required for details, overhead stops, and other door hardware items interfering with closer mounting.

2.17 ELECTRO-HYDRAULIC AUTOMATIC OPERATORS

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product:
   a. LCN 4600 series

2. Acceptable Manufacturers and Products:
   a. No Substitute

B. Requirements:

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 drop plates, brackets, and adapters for arms as required for details.
6. Provide actuator switches and receivers for operation as specified.
7. Provide weather-resistant actuators at exterior applications.
8. 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.
9. 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.
10. Provide units with vestibule inputs that allow sequencing operation of two units, and SPDT relay for interfacing with latching or locking devices.

2.18 DOOR TRIM

A. Manufacturers:

1. Scheduled Manufacturer:
   a. Ives

2. Acceptable Manufacturers:
   a. Rockwood

B. Requirements:

1. Provide push plates, push bars, pull plates, pulls, and hands-free reversible door pulls with diameter and length as scheduled.

2.19 PROTECTION PLATES

A. Manufacturers:

1. Scheduled Manufacturer:
   a. Ives

2. Acceptable Manufacturers:
   a. Rockwood

B. Requirements:

1. Provide protection plates with a minimum of 0.050 inch (1 mm) thick, beveled four edges as scheduled. Furnish with sheet metal or wood screws, finished to match plates.
2. Sizes plates 2 inches (51 mm) less width of door on single doors, pairs of doors with a mullion, and doors with edge guards. Size plates 1 inch (25 mm) less width of door on pairs without a mullion or edge guards.
3. At fire rated doors, provide protection plates over 16 inches high with UL label.

2.20 OVERHEAD STOPS AND OVERHEAD STOP/HOLDERS

A. Manufacturers:

1. Scheduled Manufacturers:
   a. Glynn-Johnson

B. Requirements:

1. Provide overhead stop at any door where conditions do not allow for a wall stop or floor stop presents tripping hazard.

2.21 DOOR STOPS AND HOLDERS

A. Manufacturers:

1. Scheduled Manufacturer:
   a. Ives

2. Acceptable Manufacturers:
   a. Rockwood

B. Provide door stops at each door leaf:

1. Provide wall stops wherever possible. Provide concave type where lockset has a push button of thumbturn.

2. Where a wall stop cannot be used, provide universal floor stops.
3. Where wall or floor stop cannot be used, provide overhead stop.
4. Provide roller bumper where doors open into each other and overhead stop cannot be used.

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

A. Manufacturers:

1. Scheduled Manufacturer:
   a. Zero International

B. Requirements:

1. Provide thresholds, weather-stripping, and gasketing systems as specified and per architectural details. Match finish of other items.
2. Smoke- and Draft-Control Door Assemblies: Where smoke- and draft-control door assemblies are required, provide door hardware that meets requirements of assemblies tested according to UL 1784 and installed in compliance with NFPA 105.
3. Provide door sweeps, seals, astragals, and auto door bottoms only of type where resilient or flexible seal strip is easily replaceable and readily available.
4. Size thresholds 1/2 inch (13 mm) high by 5 inches (127 mm) wide by door width unless otherwise specified in the hardware sets or detailed in the drawings.

2.23 SILENCERS

A. Manufacturers:

1. Scheduled Manufacturer:
   a. Ives

2. Acceptable Manufacturers:
   a. Rockwood

B. Requirements:

1. Provide "push-in" type silencers for hollow metal or wood frames.
2. Provide one silencer per 30 inches (762 mm) of height on each single frame, and two for each pair frame.
3. Omit where gasketing is specified.

2.24 MAGNETIC HOLDERS

A. Manufacturers:

1. Scheduled Manufacturer:
   a. LCN

B. Requirements:

1. Provide wall or floor mounted electromagnetic door release as specified with minimum of 25 pounds of holding force. Coordinate projection of holder and armature with other hardware and wall conditions to ensure that door sits parallel to wall when fully open. Connect magnetic holders on fire-rated doors into the fire control panel for fail-safe operation.

2.25 DOOR POSITION SWITCHES

A. Manufacturers:

1. Scheduled Manufacturer:
   a. Schlage

B. Requirements:

1. Provide recessed or surface mounted type door position switches as specified.
2. Coordinate door and frame preparations with door and frame suppliers. If switches are being used with magnetic locking device, provide minimum of 4 inches (102 mm) between switch and magnetic locking device.

2.26 FINISHES

A. FINISH: BHMA 626/652 (US26D); EXCEPT:

1. Hinges at Exterior Doors: BHMA 630 (US32D)
2. Aluminum Geared Continuous Hinges: BHMA 628 (US28)
3. Push Plates, Pulls, and Push Bars: BHMA 630 (US32D)
4. Protection Plates: BHMA 630 (US32D)
5. Overhead Stops and Holders: BHMA 630 (US32D)
6. Door Closers: Powder Coat to Match
7. Wall Stops: BHMA 630 (US32D)
8. Latch Protectors: BHMA 630 (US32D)
9. Weatherstripping: Clear Anodized Aluminum
10. Thresholds: Mill Finish Aluminum

PART 3 - EXECUTION

3.01 EXAMINATION

A. Prior to installation of hardware, examine doors and frames, with Installer present, for compliance with requirements for installation tolerances, labeled fire-rated door assembly construction, wall and floor construction, and other conditions affecting performance. Verify doors, frames, and walls have been properly reinforced for hardware installation.

B. Examine roughing-in for electrical power systems to verify actual locations of wiring connections before electrified door hardware installation.

C. Submit a list of deficiencies in writing and proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION

A. Mount door hardware units at heights to comply with the following, unless otherwise indicated or required to comply with governing regulations.

1. Standard Steel Doors and Frames: ANSI/SDI A250.8.
2. Custom Steel Doors and Frames: HMMA 831.
3. Interior Architectural Wood Flush Doors: ANSI/WDMA I.S. 1A
4. Installation Guide for Doors and Hardware: DHI TDH-007-20

B. Install door hardware in accordance with NFPA 80, NFPA 101 and provide post-install inspection, testing as specified in section 1.03.E unless otherwise required to comply with governing regulations.

C. Install each hardware item in compliance with manufacturer's instructions and recommendations, using only fasteners provided by manufacturer.

D. Do not install surface mounted items until finishes have been completed on substrate. Protect all installed hardware during painting.

E. Set units level, plumb and true to line and location. Adjust and reinforce attachment substrate as necessary for proper installation and operation.

F. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors according to industry standards.

G. Install operating parts so they move freely and smoothly without binding, sticking, or excessive clearance.

H. Hinges: Install types and in quantities indicated in door hardware schedule but not fewer than quantity recommended by manufacturer for application indicated.

I. Lock Cylinders:

1. Install construction cores to secure building and areas during construction period.
2. Replace construction cores with permanent cores as indicated in keying section.
3. Furnish permanent cores to Owner for installation.

J. Wiring: Coordinate with Division 26, ELECTRICAL and Division 28 ELECTRONIC SAFETY AND SECURITY sections for:

1. Conduit, junction boxes and wire pulls.
2. Connections to and from power supplies to electrified hardware.
3. Connections to fire/smoke alarm system and smoke evacuation system.
4. Connection of wire to door position switches and wire runs to central room or area, as directed by Architect.
5. Connections to panel interface modules, controllers, and gateways.
6. Testing and labeling wires with Architect's opening number.

K. Key Control System: Tag keys and place them on markers and hooks in key control system cabinet, as determined by final keying schedule.

L. Continuous Hinges: Re-locate the door and frame fire rating labels where they will remain visible so that the hinge does not cover the label once installed.

M. Door Closers & Auto Operators: Mount closers/operators on room side of corridor doors, inside of exterior doors, and stair side of stairway doors from corridors. Mount closers/operators so they are not visible in corridors, lobbies and other public spaces unless approved by Architect. Install closers through door with sex bolts

N. Overhead Stops/Holders: Mount overhead stops/holders on room side of corridor doors, inside of exterior doors, and stair side of stairway doors.

O. Power Supplies: Locate power supplies as indicated or, if not indicated, above accessible ceilings or in equipment room, or alternate location as directed by Architect.

P. Thresholds: Set thresholds in full bed of sealant complying with requirements specified in Division 07 Section "Joint Sealants."

Q. Stops: Provide floor stops for doors unless wall or other type stops are indicated in door hardware schedule. Do not mount floor stops where they may impede traffic or present tripping hazard.

R. Perimeter Gasketing: Apply to head and jamb, forming seal between door and frame.

S. Meeting Stile Gasketing: Fasten to meeting stiles, forming seal when doors are closed.

T. Door Bottoms and Sweeps: Apply to bottom of door, forming seal with threshold when door is closed.

3.03 ADJUSTING

A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.

1. Spring Hinges: Adjust to achieve positive latching when door can close freely from an open position of 30 degrees.
2. Electric Strikes: Adjust horizontal and vertical alignment of keeper to properly engage lock bolt.
3. Door Closers: Adjust sweep period to comply with accessibility requirements and requirements of authorities having jurisdiction.

B. Occupancy Adjustment: Approximately three to six months after date of Substantial Completion, examine and readjust each item of door hardware, including adjusting operating forces, as necessary to ensure function of doors and door hardware.

3.04 CLEANING AND PROTECTION

A. Clean adjacent surfaces soiled by door hardware installation.

B. Clean operating items per manufacturer's instructions to restore proper function and finish.

C. Provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of Substantial Completion.

3.05 DOOR HARDWARE SCHEDULE

A. The intent of the hardware specification is to specify the hardware for interior and exterior doors, and to establish a type, continuity, and standard of quality. However, it is the door hardware supplier's responsibility to thoroughly review existing conditions, schedules, specifications, drawings, and other Contract Documents to verify the suitability of the hardware specified.

B. Discrepancies, conflicting hardware, and missing items are to be brought to the attention of the architect with corrections made prior to the bidding process. Omitted items not included in a hardware set should be scheduled with the appropriate additional hardware required for proper application.

C. Hardware items are referenced in the following hardware schedule. Refer to the above specifications for special features, options, cylinders/keying, and other requirements.

D. Hardware Sets:

125422 OPT0405446 Version 1

Legend:
Link to catalog cut sheet
Electrified Opening

Hardware Group No. 01

For use on Door #(s):
A102A A103A

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER			FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5			652	IVE
1	EA	VANDL CLASSROOM LOCK	ND94P6D RHO			626	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	WS401/402CVX			626	IVE
1	EA	MAGNETIC DOOR HOLDER	SEM7850 12V/24V/120V		✓	689	LCN
1	EA	GASKETING	488SBK PSA @ HEAD & JAMBS			BK	ZER

Hardware Group No. 02

For use on Door #(s):
A103B C101A

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER			FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5			652	IVE
1	EA	VANDL STOREROOM LOCK	ND96P6D RHO			626	SCH
1	EA	ELECTRIC STRIKE	1500 12/24 VDC FAIL SAFE		✓	630	HES
1	EA	SURFACE CLOSER	4040XP			689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS			630	IVE
1	EA	WALL STOP	WS401/402CCV			626	IVE
1	EA	MAGNETIC DOOR HOLDER	SEM7850 12V/24V/120V		✓	689	LCN
1	EA	WIRE HARNESS	CON-XXXP (LENGTH AS REQUIRED) VERIFY LENGTH		✓		SCH
1	EA	CREDENTIAL READER	BY DIVISION 28.		✓		
1	EA	DOOR POSITION SWITCH	BY DIVISION 28.		✓	628	SCE
1	EA	LOW VOLTAGE POWER	BY LOW VOLTAGE.		✓		

OPERATION:
DOOR IS NORMALLY LATCHED AND SECURED
PRESENTING VALID CREDENTIAL TEMPORARILY RELEASES STRIKE FOR ENTRY
DOOR IS SECURED UPON LOSS OF POWER TO THE STRIKE
FREE EGRESS AT ALL TIMES

Hardware Group No. 03

For use on Door #(s):
A105A B131A B132A B133A N102A N104A

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5 NRP		652	IVE
1	EA	PRIVACY LOCK W/ OUTSIDE INDICATOR	ND40S RHO OS-OCC		626	SCH
1	EA	SURFACE CLOSER	4040XP SCUSH		689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS		630	IVE
1	EA	GASKETING	488SBK PSA @ HEAD & JAMBS		BK	ZER

Hardware Group No. 04

For use on Door #(s):

A106A	A120A	B110A	B126A	B134A	B135A
C103A	C125A	D102A	D108A	D112A	D113A
D149A	D210A	D214A	D230A	F109A	F110A

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5		652	IVE
1	EA	VANDL STOREROOM LOCK	ND96P6D RHO		626	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	WS401/402CCV		626	IVE
3	EA	SILENCER	SR64		GRY	IVE

Hardware Group No. 05

For use on Door #(s):

A107A	A128A	B116A	B121A	B136B	B145A
C108A	D115A	D115B	D122A	D122B	D148A
F104A					

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5		652	IVE
1	EA	VANDL ENTRANCE LOCK	ND92P6D RHO		626	SCH
1	EA	WALL STOP	WS401/402CCV		626	IVE
3	EA	SILENCER	SR64		GRY	IVE

Hardware Group No. 06

For use on Door #(s):

A108A	A114A

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5		652	IVE
1	EA	PASSAGE SET	ND10S RHO		626	SCH
1	EA	SURFACE CLOSER	4040XP SCUSH		689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS		630	IVE
3	EA	SILENCER	SR64		GRY	IVE

Hardware Group No. 07

For use on Door #(s):
A114B A131A

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5		652	IVE
1	EA	PANIC HARDWARE	98-L-BE-06		626	VON
1	EA	SURFACE CLOSER	4040XP SCUSH		689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS		630	IVE
3	EA	SILENCER	SR64		GRY	IVE

Hardware Group No. 08

For use on Door #(s):
A121A

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5		652	IVE
1	EA	PASSAGE SET	ND10S RHO		626	SCH
1	EA	WALL STOP	WS401/402CCV		626	IVE
3	EA	SILENCER	SR64		GRY	IVE

Hardware Group No. 09

For use on Door #(s):
A114C A131B

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5 NRP		630	IVE
1	EA	PANIC HARDWARE	CD-98-NL		626	VON
1	EA	FSIC RIM CYL. HOUSING	20-079		626	SCH
1	EA	MORTISE CYLINDER	26-094 (CAM & RING AS REQ'D)		626	SCH
2	EA	PERMANENT FSIC CORE	23-030 EV29 T		626	SCH
1	EA	SURFACE CLOSER	4040XP EDA		689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS		630	IVE
1	EA	FLOOR STOP	FS18S		BLK	IVE
1	EA	RAIN DRIP	142AA (AS REQ'D)		AA	ZER
1	SET	GASKETING	429 @ HEAD & JAMBS		AA	ZER
1	EA	DOOR SWEEP	39A		A	ZER
1	EA	THRESHOLD	655A - OR PER SILL DETAILS		A	ZER
1	EA	DOOR POSITION SWITCH	BY DIVISION 28.		628	SCE

Hardware Group No. 10

For use on Door #(s):
A134A

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER			FINISH	MFR
1	EA	CONT. HINGE	114XY			628	IVE
1	EA	FIRE EXIT HARDWARE	98-L-NL-F-06			626	VON
1	EA	FSIC RIM CYL. HOUSING	20-079			626	SCH
1	EA	PERMANENT FSIC CORE	23-030 EV29 T			626	SCH
1	EA	ELECTRIC STRIKE	9500 FSE 12/24VDC		✓	630	HES
1	EA	SURFACE CLOSER	4040XP EDA			689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS			630	IVE
1	EA	WALL STOP	WS401/402CVX			626	IVE
1	EA	MAGNETIC DOOR HOLDER	SEM7850 12V/24V/120V		✓	689	LCN
1	EA	GASKETING	488SBK PSA @ HEAD & JAMBS			BK	ZER
1	EA	WIRE HARNESS	CON-XXXP (LENGTH AS REQUIRED) VERIFY LENGTH		✓		SCH
1	EA	CREDENTIAL READER	BY DIVISION 28.		✓		
1	EA	DOOR POSITION SWITCH	BY DIVISION 28.		✓	628	SCE
1	EA	LOW VOLTAGE POWER	BY LOW VOLTAGE.		✓		

DOOR IS NORMALLY LOCKED. RESTRICTING ENTRY.
AUTHORIZED CREDENTIAL AT OUTSIDE CARD READER MOMENTARILY RELEASES ELECTRIC STRIKE TO ALLOW ENTRY OR BY KEY.
INSIDE TOUCHBAR ALWAYS ALLOWS EGRESS.
MAG HOLD OPEN LOSS OF POWER AND/OR ACTIVATION OF FIRE ALARM SYSTEM, ALLOWING DOOR TO CLOSE AND LATCH.

Hardware Group No. 11

For use on Door #(s):
A115A A129A A130A A215A A229A B108A

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5		652	IVE
1	EA	VANDL STOREROOM LOCK	ND96P6D RHO		626	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	WS401/402CVX		626	IVE
3	EA	SILENCER	SR64		GRY	IVE

Hardware Group No. 12

For use on Door #(s):

A123A	A124A	A202A	A203A	B139A	B146A
B207A	B208A	C113A	C114A	C115A	C116A
C119A	C121A	D117A	D124A	D207A	D208A
F117A					

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5		652	IVE
1	EA	PRIVACY LOCK W/ OUTSIDE INDICATOR	ND40S RHO OS-OCC		626	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	WS401/402CCV		626	IVE
1	EA	GASKETING	488SBK PSA @ HEAD & JAMBS		BK	ZER

Hardware Group No. 13

For use on Door #(s):

C122B

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5 NRP		630	IVE
1	EA	FIRE EXIT HARDWARE	98-L-F-06		626	VON
1	EA	FSIC RIM CYL. HOUSING	20-079		626	SCH
2	EA	PERMANENT FSIC CORE	23-030 EV29 T		626	SCH
1	EA	SURFACE CLOSER	4040XP EDA		689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS		630	IVE
1	EA	WALL STOP	WS401/402CCV		626	IVE
1	EA	GASKETING	488SBK PSA @ HEAD & JAMBS		BK	ZER

Hardware Group No. 14

For use on Door #(s):

B102A C128D

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5		652	IVE
1	EA	VANDL CLASSROOM LOCK	ND94P6D RHO		626	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	WS401/402CVX		626	IVE
1	EA	GASKETING	488SBK PSA @ HEAD & JAMBS		BK	ZER

Hardware Group No. 15

For use on Door #(s):

A126A	A127A	A204A	A205A	A206A	A207A
B101A	B105A	B106A	B201A	B201B	D107A
D110A	D118A	D125A	D133A	D141A	D145A
D201A	D202A	D203A	D204A	D211A	D215A
D217A	D219A	D220A	D221A	D221B	D224A
D225A	D227A	D227B	D228A	D228B	F102B

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5 NRP		652	IVE
1	EA	VANDL CLASSROOM LOCK	ND94P6D RHO		626	SCH
1	EA	SURFACE CLOSER	4040XP EDA		689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS		630	IVE
1	EA	WALL STOP	WS401/402CVX		626	IVE
3	EA	SILENCER	SR64		GRY	IVE

Hardware Group No. 16

For use on Door #(s):

A133A	A201A	A212A	B204A	B205A	C117A
C117B	C122D	C122E	C133A	D105A	D132A

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5		652	IVE
1	EA	VANDL STOREROOM LOCK	ND96P6D RHO		626	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	WS401/402CCV		626	IVE
1	EA	GASKETING	488SBK PSA @ HEAD & JAMBS		BK	ZER

Hardware Group No. 17

For use on Door #(s):

D142A

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5		652	IVE
1	EA	VANDL STOREROOM LOCK	ND96P6D RHO		626	SCH
1	EA	FIRE/LIFE CLOSER	4040SE TBWMS 24V/120V AC/DC AS REQ		689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS		630	IVE
1	EA	GASKETING	488SBK PSA @ HEAD & JAMBS		BK	ZER

Hardware Group No. 18

For use on Door #(s):

A216A	A222A	A227A	A231A	B107A	B210A
B211A	C129A	D103A	D226A	F105A	F116A

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5		652	IVE
1	EA	VANDL STOREROOM LOCK	ND96P6D RHO		626	SCH
1	EA	OH STOP	90S		630	GLY
1	EA	SURFACE CLOSER	4040XP		689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS		630	IVE
3	EA	SILENCER	SR64		GRY	IVE

Hardware Group No. 19

For use on Door #(s):

A225A	B123B	D223A	D234A

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5 NRP		652	IVE
1	EA	VANDL STOREROOM LOCK	ND96P6D RHO		626	SCH
1	EA	SURFACE CLOSER	4040XP SCUSH		689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS		630	IVE
1	EA	GASKETING	488SBK PSA @ HEAD & JAMBS		BK	ZER

Hardware Group No. 20

For use on Door #(s):

B120A

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5 NRP		652	IVE
1	EA	VANDL STOREROOM LOCK	ND96P6D RHO		626	SCH
1	EA	SURFACE CLOSER	4040XP EDA		689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS		630	IVE
1	EA	WALL STOP	WS401/402CCV		626	IVE
1	EA	GASKETING	488SBK PSA @ HEAD & JAMBS		BK	ZER

Hardware Group No. 21

For use on Door #(s):

A227B	A228A	B103A	B104A	B123A	C127A
D153A	D154A	D216A	D229A		

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5 NRP		652	IVE
1	EA	VANDL STOREROOM LOCK	ND96P6D RHO		626	SCH
1	EA	SURFACE CLOSER	4040XP EDA		689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS		630	IVE
1	EA	WALL STOP	WS401/402CCV		626	IVE
3	EA	SILENCER	SR64		GRY	IVE

Hardware Group No. 22

For use on Door #(s):

B151F	B151G	B152F	B152G	B202D	B203A
D114B	D114C	D114D	D114E	D114F	D120A
D120B	D120C	D120D	D121B	D121C	D121D
D121E	D121F	D127D	D130A	D130B	D131A
D131B	D136A	D138A	D212D	D213A	

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5 NRP		652	IVE
1	EA	PRIVACY LOCK W/ OUTSIDE INDICATOR	ND40S RHO OS-OCC		626	SCH
1	EA	OH STOP	90S		630	GLY
1	EA	GASKETING	488SBK PSA @ HEAD & JAMBS		BK	ZER

Hardware Group No. 23

For use on Door #(s):

A125A	C118A	C120A	D218A

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5		652	IVE
1	EA	VANDL CLASSROOM LOCK	ND94P6D RHO		626	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	WS401/402CVX		626	IVE
3	EA	SILENCER	SR64		GRY	IVE

Hardware Group No. 24

For use on Door #(s):
C126A C126B

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
1	EA	CONT. HINGE	114XY		628	IVE
1	EA	VANDL CLASSROOM LOCK	ND94P6D RHO		626	SCH
1	EA	OH STOP	90S		630	GLY
1	EA	SURFACE CLOSER	4040XP		689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS		630	IVE
1	EA	WALL STOP	WS401/402CVX		626	IVE
1	EA	GASKETING	488SBK PSA @ HEAD & JAMBS		BK	ZER

Hardware Group No. 25

For use on Door #(s):

B151A	B151B	B151C	B151D	B151E	B152A
B152B	B152C	B152D	B152E	B202A	B202B
B202C	B203B	B203C	B203D	D127A	D127B
D127C	D130C	D130D	D130E	D130F	D130G
D131C	D131D	D131E	D131F	D131G	D212A
D212B	D212C	D213B	D213C	D213D	

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5		652	IVE
1	EA	PRIVACY LOCK W/ OUTSIDE INDICATOR	ND40S RHO OS-OCC		626	SCH
1	EA	WALL STOP	WS401/402CCV		626	IVE
1	EA	GASKETING	488SBK PSA @ HEAD & JAMBS		BK	ZER

Hardware Group No. 26

For use on Door #(s):
A234A

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
1	EA	CONT. HINGE	114XY		628	IVE
1	EA	FIRE EXIT HARDWARE	98-EO-F		626	VON
1	EA	SURFACE CLOSER	4040XP EDA		689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS		630	IVE
1	EA	WALL STOP	WS401/402CCV		626	IVE
1	EA	GASKETING	488SBK PSA @ HEAD & JAMBS		BK	ZER

Hardware Group No. 27

For use on Door #(s):
B158B D152B D152C D238A D238C

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER			FINISH	MFR
8	EA	HINGE	5BB1HW 4.5 X 4.5 NRP			652	IVE
1	EA	FIRE RATED REMOVABLE MULLION	KR9954 STAB			689	VON
2	EA	FIRE EXIT HARDWARE	98-EO-F			626	VON
1	EA	MORTISE CYLINDER	26-094 (CAM & RING AS REQ'D)			626	SCH
1	EA	PERMANENT FSIC CORE	23-030 EV29 T			626	SCH
2	EA	SURFACE CLOSER	4040XP EDA			689	LCN
2	EA	KICK PLATE	8400 10" X 2" LDW B-CS			630	IVE
2	EA	MAGNETIC DOOR HOLDER	SEM7850 12V/24V/120V			689	LCN
1	EA	GASKETING	488SBK PSA @ HEAD & JAMBS			BK	ZER
2	EA	MULLION SEAL	8780NBK PSA			BK	ZER

MAG HOLD OPEN, ON LOSS OF POWER AND/OR ACTIVATION OF FIRE ALARM SYSTEM DOORS TO RELEASE TO CLOSE AND LATCH.

Hardware Group No. 28

For use on Door #(s):
A236A A237A F102A

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER			FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5 NRP			652	IVE
1	EA	VANDL CLASSROOM LOCK	ND94P6D RHO			626	SCH
1	EA	SURFACE CLOSER	4040XP EDA			689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS			630	IVE
1	EA	WALL STOP	WS401/402CVX			626	IVE
1	EA	GASKETING	488SBK PSA @ HEAD & JAMBS			BK	ZER

Hardware Group No. 29

For use on Door #(s):
C102A

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5 NRP		652	IVE
1	EA	PANIC HARDWARE	98-L-NL-06		626	VON
1	EA	FSIC RIM CYL. HOUSING	20-079		626	SCH
1	EA	PERMANENT FSIC CORE	23-030 EV29 T		626	SCH
1	EA	SURFACE CLOSER	4040XP EDA		689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS		630	IVE
1	EA	WALL STOP	WS401/402CCV		626	IVE
3	EA	SILENCER	SR64		GRY	IVE

Hardware Group No. 30

For use on Door #(s):
C105B

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5 NRP		630	IVE
1	EA	VANDL STOREROOM LOCK	ND96P6D RHO		626	SCH
1	EA	LOCK GUARD	LG14		630	IVE
1	EA	SURFACE CLOSER	4040XP SCUSH		689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS		630	IVE
1	EA	RAIN DRIP	142AA (AS REQ'D)		AA	ZER
1	SET	GASKETING	429 @ HEAD & JAMBS		AA	ZER
1	EA	DOOR SWEEP	39A		A	ZER
1	EA	THRESHOLD	655A - OR PER SILL DETAILS		A	ZER
1	EA	DOOR POSITION SWITCH	BY DIVISION 28.		628	SCE

Hardware Group No. 31

For use on Door #(s):
C128C F108A

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER			FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5 NRP			630	IVE
1	EA	PANIC HARDWARE	LD-98-NL-SNB			626	VON
1	EA	ELECTRIC STRIKE	9500 FSE 12/24VDC		✓	630	HES
1	EA	SURFACE CLOSER	4040XP SCUSH			689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS			630	IVE
1	EA	RAIN DRIP	142AA (AS REQ'D)			AA	ZER
1	SET	GASKETING	429 @ HEAD & JAMBS			AA	ZER
1	EA	DOOR SWEEP	39A			A	ZER
1	EA	THRESHOLD	655A - OR PER SILL DETAILS			A	ZER
1	EA	WIRE HARNESS	CON-XXXP (LENGTH AS REQUIRED) VERIFY LENGTH		✓		SCH
1	EA	CREDENTIAL READER	BY DIVISION 28.		✓		
1	EA	DOOR POSITION SWITCH	BY DIVISION 28.		✓	628	SCE
1	EA	LOW VOLTAGE POWER	BY LOW VOLTAGE.		✓		

OPERATION:
DOOR IS NORMALLY LATCHED AND SECURED
PRESENTING VALID CREDENTIAL TEMPORARILY RELEASES STRIKE FOR ENTRY
DOOR IS SECURED UPON LOSS OF POWER TO THE STRIKE
FREE EGRESS AT ALL TIMES

Hardware Group No. 32

For use on Door #(s):
F115A

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER			FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5 NRP			630	IVE
1	EA	PANIC HARDWARE	LD-98-NL-SNB			626	VON
1	EA	FSIC RIM CYL. HOUSING	20-079			626	SCH
2	EA	PERMANENT FSIC CORE	23-030 EV29 T			626	SCH
1	EA	SURFACE CLOSER	4040XP SCUSH			689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS			630	IVE
1	EA	RAIN DRIP	142AA (AS REQ'D)			AA	ZER
1	SET	GASKETING	429 @ HEAD & JAMBS			AA	ZER
1	EA	DOOR SWEEP	39A			A	ZER
1	EA	THRESHOLD	655A - OR PER SILL DETAILS			A	ZER
1	EA	DOOR POSITION SWITCH	BY DIVISION 28.		✓	628	SCE

Hardware Group No. 33

For use on Door #(s):
D101A D101B D114A D121A D139A D146A

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER			FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5 NRP			652	IVE
1	EA	PANIC HARDWARE	98-L-06			626	VON
1	EA	FSIC RIM CYL. HOUSING	20-079			626	SCH
1	EA	PERMANENT FSIC CORE	23-030 EV29 T			626	SCH
1	EA	SURFACE CLOSER	4040XP EDA			689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS			630	IVE
1	EA	WALL STOP	WS401/402CCV			626	IVE
3	EA	SILENCER	SR64			GRY	IVE

Hardware Group No. 34

For use on Door #(s):
A122A

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER			FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5 NRP			652	IVE
1	EA	PANIC HARDWARE	98-L-NL-06			626	VON
1	EA	FSIC RIM CYL. HOUSING	20-079			626	SCH
1	EA	PERMANENT FSIC CORE	23-030 EV29 T			626	SCH
1	EA	ELECTRIC STRIKE	9500 FSE 12/24VDC		✓	630	HES
1	EA	SURFACE CLOSER	4040XP EDA			689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS			630	IVE
1	EA	WALL STOP	WS401/402CCV			626	IVE
3	EA	SILENCER	SR64			GRY	IVE
1	EA	WIRE HARNESS	CON-XXXP (LENGTH AS REQUIRED) VERIFY LENGTH		✓		SCH
1	EA	CREDENTIAL READER	BY DIVISION 28.		✓		
1	EA	DOOR POSITION SWITCH	BY DIVISION 28.		✓	628	SCE
1	EA	LOW VOLTAGE POWER	BY LOW VOLTAGE.		✓		

DOOR IS NORMALLY LOCKED. RESTRICTING ENTRY.
AUTHORIZED CREDENTIAL AT OUTSIDE CARD READER MOMENTARILY RELEASES ELECTRIC STRIKE TO ALLOW ENTRY OR BY KEY.
INSIDE TOUCHBAR ALWAYS ALLOWS EGRESS.

Hardware Group No. 35

For use on Door #(s):
E101C E101D

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER			FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5 NRP			630	IVE
1	EA	PANIC HARDWARE	CD-98-NL-SNB			626	VON
1	EA	FSIC RIM CYL. HOUSING	20-079			626	SCH
1	EA	MORTISE CYLINDER	26-094 (CAM & RING AS REQ'D)			626	SCH
2	EA	PERMANENT FSIC CORE	23-030 EV29 T			626	SCH
1	EA	SURFACE CLOSER	4040XP SCUSH			689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS			630	IVE
1	EA	RAIN DRIP	142AA (AS REQ'D)			AA	ZER
1	SET	GASKETING	429 @ HEAD & JAMBS			AA	ZER
1	EA	DOOR SWEEP	39A			A	ZER
1	EA	THRESHOLD	655A - OR PER SILL DETAILS			A	ZER
1	EA	DOOR POSITION SWITCH	BY DIVISION 28.		✓	628	SCE

Hardware Group No. 36

For use on Door #(s):
A230A B127A D111A D205A

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER			FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5			652	IVE
1	EA	VANDL STOREROOM LOCK	ND96P6D RHO			626	SCH
1	EA	ELECTRIC STRIKE	1500 12/24 VDC FAIL SAFE		✓	630	HES
1	EA	SURFACE CLOSER	4040XP			689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS			630	IVE
1	EA	WALL STOP	WS401/402CCV			626	IVE
3	EA	SILENCER	SR64			GRY	IVE
1	EA	WIRE HARNESS	CON-XXXP (LENGTH AS REQUIRED) VERIFY LENGTH		✓		SCH
1	EA	CREDENTIAL READER	BY DIVISION 28.		✓		
1	EA	DOOR POSITION SWITCH	BY DIVISION 28.		✓	628	SCE
1	EA	LOW VOLTAGE POWER	BY LOW VOLTAGE.		✓		

OPERATION:
DOOR IS NORMALLY LATCHED AND SECURED
PRESENTING VALID CREDENTIAL TEMPORARILY RELEASES STRIKE FOR ENTRY
DOOR IS SECURED UPON LOSS OF POWER TO THE STRIKE
FREE EGRESS AT ALL TIMES

Hardware Group No. 37

For use on Door #(s):
C122C

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5		652	IVE
1	EA	VANDL CLASSROOM LOCK	ND94P6D RHO		626	SCH
1	EA	OH STOP	90S		630	GLY
1	EA	SURFACE CLOSER	4040XP		689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS		630	IVE
1	EA	GASKETING	488SBK PSA @ HEAD & JAMBS		BK	ZER

Hardware Group No. 38

For use on Door #(s):
C132A C241A C242A D206A

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
1	EA	CONT. HINGE	114XY		628	IVE
1	EA	VANDL STOREROOM LOCK	ND96P6D RHO		626	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	WS401/402CCV		626	IVE
3	EA	SILENCER	SR64		GRY	IVE

Hardware Group No. 39

For use on Door #(s):
B115A B141A D109A D118B D125B D130H
D134A D137A D147A D239A F101A F103A
N101A N103A N105A N201A N302B N402A
N501A

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5 NRP		652	IVE
1	EA	VANDL STOREROOM LOCK	ND96P6D RHO		626	SCH
1	EA	SURFACE CLOSER	4040XP SCUSH		689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS		630	IVE
3	EA	SILENCER	SR64		GRY	IVE

Hardware Group No. 40

For use on Door #(s):
D209A

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
1	EA	CONT. HINGE	114XY		628	IVE
1	EA	VANDL STOREROOM LOCK	ND96P6D RHO		626	SCH
1	EA	SURFACE CLOSER	4040XP SCUSH		689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS		630	IVE
3	EA	SILENCER	SR64		GRY	IVE

Hardware Group No. 41

For use on Door #(s):
F107A F107C

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5		652	IVE
1	EA	VANDL STOREROOM LOCK	ND96P6D RHO		626	SCH
1	EA	SURFACE CLOSER	4040XP		689	LCN
1	EA	WALL STOP	WS401/402CCV		626	IVE
1	EA	RAIN DRIP	142AA (AS REQ'D)		AA	ZER
1	EA	GASKETING	8303AA		AA	ZER
1	EA	DOOR SWEEP	111AA		AA	ZER
1	EA	THRESHOLD	655A - OR PER SILL DETAILS		A	ZER
1	EA	DOOR POSITION SWITCH	BY DIVISION 28.		628	SCE

Hardware Group No. 42

For use on Door #(s):
B136A

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
1	EA	CONT. HINGE	114XY		628	IVE
1	EA	VANDL ENTRANCE LOCK	ND92P6D RHO		626	SCH
1	EA	WALL STOP	WS401/402CCV		626	IVE
3	EA	SILENCER	SR64		GRY	IVE

Hardware Group No. 43

For use on Door #(s):
D143A D144A

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5		652	IVE
1	EA	VANDL ENTRANCE LOCK	ND92P6D RHO		626	SCH
1	EA	SURFACE CLOSER	4040XP		689	LCN
1	EA	WALL STOP	WS401/402CCV		626	IVE
1	EA	MAGNETIC DOOR HOLDER	SEM7850 12V/24V/120V		689	LCN
1	EA	GASKETING	488SBK PSA @ HEAD & JAMBS		BK	ZER

Hardware Group No. 44

For use on Door #(s):
C106A C107A D116A D123A D135A F106A

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5	652	IVE
1	EA	PASSAGE SET	ND10S RHO	626	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	WS401/402CCV	626	IVE
3	EA	SILENCER	SR64	GRY	IVE

Hardware Group No. 45

For use on Door #(s):
D140A D140B

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5		652	IVE
1	EA	PASSAGE SET	ND10S RHO		626	SCH
1	EA	SURFACE CLOSER	4040XP		689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS		630	IVE
1	EA	MAGNETIC DOOR HOLDER	SEM7850 12V/24V/120V		689	LCN
1	EA	GASKETING	488SBK PSA @ HEAD & JAMBS		BK	ZER

Hardware Group No. 46

For use on Door #(s):
B206A D222A D222B D233A D233B

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5		652	IVE
1	EA	PASSAGE SET	ND10S RHO		626	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	WS401/402CCV		626	IVE
1	EA	GASKETING	488SBK PSA @ HEAD & JAMBS		BK	ZER

Hardware Group No. 47

For use on Door #(s):
C124A C131A

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5		652	IVE
1	EA	PASSAGE SET	ND10S RHO		626	SCH
1	EA	OH STOP	90S		630	GLY
1	EA	SURFACE CLOSER	4040XP		689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS		630	IVE
1	EA	GASKETING	488SBK PSA @ HEAD & JAMBS		BK	ZER

Hardware Group No. 48

For use on Door #(s):
F114A

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
6	EA	HINGE	5BB1HW 4.5 X 4.5 NRP		630	IVE
1	EA	REMOVABLE MULLION	KR4954 STAB		689	VON
1	EA	PANIC HARDWARE	98-EO-SNB		626	VON
1	EA	PANIC HARDWARE	98-NL-SNB		626	VON
1	EA	FSIC RIM CYL. HOUSING	20-079		626	SCH
1	EA	MORTISE CYLINDER	26-094 (CAM & RING AS REQ'D)		626	SCH
2	EA	PERMANENT FSIC CORE	23-030 EV29 T		626	SCH
2	EA	SURFACE CLOSER	4040XP SCUSH		689	LCN
2	EA	KICK PLATE	8400 10" X 2" LDW B-CS		630	IVE
1	EA	RAIN DRIP	142AA (AS REQ'D)		AA	ZER
1	SET	GASKETING	429 @ HEAD & JAMBS		AA	ZER
2	EA	MULLION SEAL	8780NBK PSA		BK	ZER
2	EA	DOOR SWEEP	39A		A	ZER
1	EA	THRESHOLD	655A - OR PER SILL DETAILS		A	ZER
2	EA	DOOR POSITION SWITCH	BY DIVISION 28.		628	SCE

Hardware Group No. 49

For use on Door #(s):
A112A A112B

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
6	EA	HINGE	5BB1HW 4.5 X 4.5 NRP		652	IVE
1	EA	FIRE RATED REMOVABLE MULLION	KR9954 STAB		689	VON
2	EA	FIRE EXIT HARDWARE	98-L-F-06		626	VON
2	EA	FSIC RIM CYL. HOUSING	20-079		626	SCH
1	EA	MORTISE CYLINDER	26-094 (CAM & RING AS REQ'D)		626	SCH
3	EA	PERMANENT FSIC CORE	23-030 EV29 T		626	SCH
2	EA	SURFACE CLOSER	4040XP SCUSH		689	LCN
2	EA	KICK PLATE	8400 10" X 2" LDW B-CS		630	IVE
1	EA	GASKETING	488SBK PSA @ HEAD & JAMBS		BK	ZER
2	EA	MULLION SEAL	8780NBK PSA		BK	ZER

Hardware Group No. 50

For use on Door #(s):
A112C

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
6	EA	HINGE	5BB1HW 4.5 X 4.5 NRP		652	IVE
1	EA	REMOVABLE MULLION	KR4954 STAB		689	VON
2	EA	PANIC HARDWARE	98-L-06		626	VON
2	EA	FSIC RIM CYL. HOUSING	20-079		626	SCH
1	EA	MORTISE CYLINDER	26-094 (CAM & RING AS REQ'D)		626	SCH
3	EA	PERMANENT FSIC CORE	23-030 EV29 T		626	SCH
2	EA	SURFACE CLOSER	4040XP SCUSH		689	LCN
2	EA	KICK PLATE	8400 10" X 2" LDW B-CS		630	IVE
1	EA	GASKETING	488SBK PSA @ HEAD & JAMBS		BK	ZER
2	EA	MULLION SEAL	8780NBK PSA		BK	ZER

Hardware Group No. 51

For use on Door #(s):
E101H E102C

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
6	EA	HINGE	5BB1HW 4.5 X 4.5 NRP		652	IVE
1	EA	REMOVABLE MULLION	KR4954 STAB		689	VON
2	EA	PANIC HARDWARE	98-L-06		626	VON
2	EA	FSIC RIM CYL. HOUSING	20-079		626	SCH
1	EA	MORTISE CYLINDER	26-094 (CAM & RING AS REQ'D)		626	SCH
3	EA	PERMANENT FSIC CORE	23-030 EV29 T		626	SCH
2	EA	SURFACE CLOSER	4040XP EDA		689	LCN
2	EA	KICK PLATE	8400 10" X 2" LDW B-CS		630	IVE
1	EA	GASKETING	488SBK PSA @ HEAD & JAMBS		BK	ZER
2	EA	MULLION SEAL	8780NBK PSA		BK	ZER

Hardware Group No. 52

For use on Door #(s):
A116A A118A B109A B153A

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
6	EA	HINGE	5BB1HW 4.5 X 4.5		652	IVE
1	EA	AUTO FLUSH BOLT	FB33		630	IVE
1	EA	VANDL STOREROOM LOCK	ND96P6D RHO		626	SCH
1	EA	SURFACE CLOSER	4040XP		689	LCN
2	EA	KICK PLATE	8400 10" X 1" LDW B-CS		630	IVE
2	EA	WALL STOP	WS401/402CCV		626	IVE
2	EA	SILENCER	SR64		GRY	IVE

Hardware Group No. 53

For use on Door #(s):
C128A

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
6	EA	HINGE	5BB1HW 4.5 X 4.5		652	IVE
1	EA	AUTO FLUSH BOLT	FB33		630	IVE
1	EA	VANDL STOREROOM LOCK	ND96P6D RHO		626	SCH
1	EA	COORDINATOR	COR X FL		628	IVE
1	EA	OH STOP	90S		630	GLY
2	EA	SURFACE CLOSER	4040XP		689	LCN
2	EA	KICK PLATE	8400 10" X 1" LDW B-CS		630	IVE
1	EA	WALL STOP	WS401/402CCV		626	IVE
2	EA	MEETING STILE	328AA-S		AA	ZER
1	EA	GASKETING	488SBK PSA @ HEAD & JAMBS		BK	ZER

Hardware Group No. 54

For use on Door #(s):
B158A D152A D152D D238B D238D

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER			FINISH	MFR
8	EA	HINGE	5BB1HW 4.5 X 4.5 NRP			652	IVE
1	EA	POWER TRANSFER	EPT10 CON			689	VON
1	EA	FIRE RATED REMOVABLE MULLION	KR9954 STAB			689	VON
1	EA	FIRE EXIT HARDWARE	98-EO-F			626	VON
1	EA	ELEC FIRE EXIT HARDWARE	QEL-98-L-NL-F-06-CON 24 VDC			626	VON
1	EA	FSIC RIM CYL. HOUSING	20-079			626	SCH
1	EA	MORTISE CYLINDER	26-094 (CAM & RING AS REQ'D)			626	SCH
2	EA	PERMANENT FSIC CORE	23-030 EV29 T			626	SCH
2	EA	SURFACE CLOSER	4040XP EDA			689	LCN
2	EA	KICK PLATE	8400 10" X 2" LDW B-CS			630	IVE
2	EA	MAGNETIC DOOR HOLDER	SEM7850 12V/24V/120V			689	LCN
1	EA	GASKETING	488SBK PSA @ HEAD & JAMBS			BK	ZER
2	EA	MULLION SEAL	8780NBK PSA			BK	ZER
2	EA	WIRE HARNESS	CON-XXXP (LENGTH AS REQUIRED) VERIFY LENGTH				SCH
1	EA	CREDENTIAL READER	BY DIVISION 28.				
2	EA	DOOR POSITION SWITCH	BY DIVISION 28.			628	SCE
1	EA	LOW VOLTAGE POWER	BY LOW VOLTAGE.				

MAG HOLD OPEN, ON LOSS OF POWER AND/OR ACTIVATION OF FIRE ALARM SYSTEM DOORS TO RELEASE TO CLOSE AND LATCH.
DOOR IS NORMALLY LOCKED. RESTRICTING ENTRY.
AUTHORIZED CREDENTIAL AT CARD READER MOMENTARILY RETRACTS LATCH TO ALLOW ENTRY OR BY KEY.
SHOULD OWNER DESIRE,ACCESS CONTROL SYSTEM MAY HAVE LATCH RETRACTED DURING OPEN HOURS TO ALLOW FREE PUBLIC ENTRY.
TOUCHBAR ALWAYS ALLOWS EGRESS.

Hardware Group No. 55

For use on Door #(s):
S106A

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER			FINISH	MFR
8	EA	HINGE	5BB1HW 4.5 X 4.5 NRP			652	IVE
1	EA	POWER TRANSFER	EPT10 CON			689	VON
1	EA	REMOVABLE MULLION	KR4954 STAB			689	VON
1	EA	PANIC HARDWARE	98-EO			626	VON
1	EA	ELEC PANIC HARDWARE	98-L-M996-06-FS-CON			626	VON
1	EA	FSIC RIM CYL. HOUSING	20-079			626	SCH
1	EA	MORTISE CYLINDER	26-094 (CAM & RING AS REQ'D)			626	SCH
2	EA	PERMANENT FSIC CORE	23-030 EV29 T			626	SCH
2	EA	SURFACE CLOSER	4040XP EDA			689	LCN
2	EA	KICK PLATE	8400 10" X 2" LDW B-CS			630	IVE
2	EA	WALL STOP	WS401/402CCV			626	IVE
2	EA	MULLION SEAL	8780NBK PSA			BK	ZER
2	EA	SILENCER	SR64			GRY	IVE
2	EA	WIRE HARNESS	CON-XXXP (LENGTH AS REQUIRED) VERIFY LENGTH				SCH
1	EA	CREDENTIAL READER	BY DIVISION 28.				
2	EA	DOOR POSITION SWITCH	BY DIVISION 28.			628	SCE
1	EA	LOW VOLTAGE POWER	BY LOW VOLTAGE.				

AUTHORIZED CREDENTIAL AT CARD READER TO RELEASE LEVER.
LEVER TO FAIL SAFE ON LOSS OF POWER AND/OR ACTIVATION OF FIRE ALARM SYSTEM, ALLOWING STAIRWELL RE-ENTRY.
DOOR USES SURFACE MOUNT DOOR POSITION SWITCH - DO NOT DRILL SWITCHES INTO FRAME.

Hardware Group No. 56

For use on Door #(s):
S129A S131A

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER			FINISH	MFR
2	EA	CONT. HINGE	114XY (EPT AS REQUIRED)			628	IVE
1	EA	POWER TRANSFER	EPT10 CON			689	VON
1	EA	REMOVABLE MULLION	KR4954 STAB			689	VON
1	EA	PANIC HARDWARE	98-EO			626	VON
1	EA	ELEC PANIC HARDWARE	98-L-M996-06-FS-CON			626	VON
1	EA	FSIC RIM CYL. HOUSING	20-079			626	SCH
1	EA	MORTISE CYLINDER	26-094 (CAM & RING AS REQ'D)			626	SCH
2	EA	PERMANENT FSIC CORE	23-030 EV29 T			626	SCH
2	EA	SURFACE CLOSER	4040XP EDA			689	LCN
2	EA	KICK PLATE	8400 10" X 2" LDW B-CS			630	IVE
2	EA	MAGNETIC DOOR HOLDER	SEM7850 12V/24V/120V			689	LCN
2	EA	MULLION SEAL	8780NBK PSA			BK	ZER
2	EA	SILENCER	SR64			GRY	IVE
2	EA	WIRE HARNESS	CON-XXXP (LENGTH AS REQUIRED) VERIFY LENGTH				SCH
1	EA	CREDENTIAL READER	BY DIVISION 28.				
2	EA	DOOR POSITION SWITCH	BY DIVISION 28.			628	SCE
1	EA	LOW VOLTAGE POWER	BY LOW VOLTAGE.				

MAG HOLD OPEN, ON LOSS OF POWER AND/OR ACTIVATION OF FIRE ALARM SYSTEM DOORS TO RELEASE TO CLOSE AND LATCH.
AUTHORIZED CREDENTIAL AT CARD READER TO RELEASE LEVER.
LEVER TO FAIL SAFE ON LOSS OF POWER AND/OR ACTIVATION OF FIRE ALARM SYSTEM, ALLOWING STAIRWELL RE-ENTRY.
DOOR USES SURFACE MOUNT DOOR POSITION SWITCH - DO NOT DRILL SWITCHES INTO FRAME.

Hardware Group No. 57

For use on Door #(s):
E101F E101G

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
6	EA	HINGE	5BB1HW 4.5 X 4.5 NRP		652	IVE
2	EA	PUSH PLATE	8200 6" X 16"		630	IVE
2	EA	PULL PLATE	8303 10" 6" X 16"		630	IVE
2	EA	SURFACE CLOSER	4040XP EDA		689	LCN
2	EA	KICK PLATE	8400 10" X 1" LDW B-CS		630	IVE
2	EA	WALL STOP	WS401/402CCV		626	IVE
2	EA	SILENCER	SR64		GRY	IVE

Hardware Group No. 58

For use on Door #(s):
C105A

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
2	EA	CONT. HINGE	114XY (EPT AS REQUIRED)		628	IVE
1	EA	POWER TRANSFER	EPT10 CON		689	VON
1	EA	AUTO FLUSH BOLT	FB33		630	IVE
1	EA	VANDL EU STOREROOM	ND96P6DEU RHO 14-042 12V/24V DC		626	SCH
1	EA	COORDINATOR	COR X FL		628	IVE
2	EA	MOUNTING BRACKET	MB1 OR MB2 AS REQ'D		689	IVE
2	EA	SURFACE CLOSER	4040XP EDA		689	LCN
2	EA	KICK PLATE	8400 10" X 1" LDW B-CS		630	IVE
2	EA	WALL STOP	WS401/402CCV		626	IVE
2	EA	SILENCER	SR64		GRY	IVE
2	EA	WIRE HARNESS	CON-XXXP (LENGTH AS REQUIRED) VERIFY LENGTH			SCH
1	EA	CREDENTIAL READER	BY DIVISION 28.			
2	EA	DOOR POSITION SWITCH	BY DIVISION 28.		628	SCE
1	EA	LOW VOLTAGE POWER	BY LOW VOLTAGE.			

DOOR IS NORMALLY LOCKED. RESTRICTING ENTRY.
AUTHORIZED CREDENTIAL AT OUTSIDE CARD READER MOMENTARILY UNLOCKS LEVER TO ALLOW ENTRY OR BY KEY.
INSIDE LEVER ALWAYS ALLOWS EGRESS.

Hardware Group No. 59

For use on Door #(s):
C123A C130A

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
6	EA	HINGE	5BB1HW 4.5 X 4.5 NRP		652	IVE
1	EA	PANIC HARDWARE	CD-9827-EO-LBR		626	VON
1	EA	PANIC HARDWARE	CD-9827-L-LBR-06		626	VON
1	EA	FSIC RIM CYL. HOUSING	20-079		626	SCH
2	EA	MORTISE CYLINDER	26-094 (CAM & RING AS REQ'D)		626	SCH
3	EA	PERMANENT FSIC CORE	23-030 EV29 T		626	SCH
2	EA	SURFACE CLOSER	4040XP EDA		689	LCN
2	EA	KICK PLATE	8400 10" X 1" LDW B-CS		630	IVE
2	EA	WALL STOP	WS401/402CCV		626	IVE
1	EA	GASKETING	488SBK PSA @ HEAD & JAMBS		BK	ZER

Hardware Group No. 60

For use on Door #(s):
C122A

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
6	EA	HINGE	5BB1HW 4.5 X 4.5 NRP		652	IVE
1	EA	FIRE EXIT HARDWARE	9827-EO-F-LBR-499F		626	VON
1	EA	FIRE EXIT HARDWARE	9827-L-F-LBRAFL-06-499F		626	VON
1	EA	FSIC RIM CYL. HOUSING	20-079		626	SCH
1	EA	PERMANENT FSIC CORE	23-030 EV29 T		626	SCH
2	EA	SURFACE CLOSER	4040XP EDA		689	LCN
2	EA	KICK PLATE	8400 10" X 1" LDW B-CS		630	IVE
2	EA	WALL STOP	WS401/402CCV		626	IVE
2	EA	MEETING STILE	328AA-S		AA	ZER
1	EA	GASKETING	488SBK PSA @ HEAD & JAMBS		BK	ZER

Hardware Group No. 61

For use on Door #(s):
E101E E102A

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER			FINISH	MFR
6	EA	HINGE	5BB1HW 4.5 X 4.5 NRP			630	IVE
1	EA	POWER TRANSFER	EPT10 CON			689	VON
1	EA	REMOVABLE MULLION	KR4954 STAB			689	VON
1	EA	PANIC HARDWARE	CD-98-EO-SNB			626	VON
1	EA	ELEC PANIC HARDWARE	QEL-98-NL-CON-SNB 24 VDC			626	VON
1	EA	FSIC RIM CYL. HOUSING	20-079			626	SCH
2	EA	MORTISE CYLINDER	26-094 (CAM & RING AS REQ'D)			626	SCH
3	EA	PERMANENT FSIC CORE	23-030 EV29 T			626	SCH
2	EA	SURFACE CLOSER	4040XP SCUSH			689	LCN
2	EA	KICK PLATE	8400 10" X 2" LDW B-CS			630	IVE
1	EA	RAIN DRIP	142AA (AS REQ'D)			AA	ZER
1	SET	GASKETING	429 @ HEAD & JAMBS			AA	ZER
2	EA	MULLION SEAL	8780NBK PSA			BK	ZER
2	EA	DOOR SWEEP	39A			A	ZER
1	EA	THRESHOLD	655A - OR PER SILL DETAILS			A	ZER
2	EA	WIRE HARNESS	CON-XXXP (LENGTH AS REQUIRED) VERIFY LENGTH				SCH
1	EA	CREDENTIAL READER	BY DIVISION 28.				
2	EA	DOOR POSITION SWITCH	BY DIVISION 28.			628	SCE
1	EA	LOW VOLTAGE POWER	BY LOW VOLTAGE.				

OPERATION:
DOOR IS NORMALLY LATCHED AND SECURED
DOOR MAY BE PROGRAMMED TO REMAIN UNLOCKED ON A SCHEDULE THROUGH ACCESS CONTROL SYSTEM
PRESENTING VALID CREDENTIAL TEMPORARILY RETRACTS LATCHBOLT FOR ENTRY WHEN DOOR IS LOCKED
DOOR IS SECURED UPON LOSS OF POWER TO THE DEVICE
FREE EGRESS AT ALL TIMES

Hardware Group No. 62

For use on Door #(s):
E101A E101B E102B

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER			FINISH	MFR
6	EA	HINGE	5BB1HW 4.5 X 4.5 NRP			630	IVE
1	EA	REMOVABLE MULLION	KR4954 STAB			689	VON
1	EA	PANIC HARDWARE	CD-98-EO-SNB			626	VON
1	EA	PANIC HARDWARE	CD-98-NL-SNB			626	VON
1	EA	FSIC RIM CYL. HOUSING	20-079			626	SCH
3	EA	MORTISE CYLINDER	26-094 (CAM & RING AS REQ'D)			626	SCH
4	EA	PERMANENT FSIC CORE	23-030 EV29 T			626	SCH
2	EA	SURFACE CLOSER	4040XP SCUSH			689	LCN
2	EA	KICK PLATE	8400 10" X 2" LDW B-CS			630	IVE
1	EA	RAIN DRIP	142AA (AS REQ'D)			AA	ZER
1	SET	GASKETING	429 @ HEAD & JAMBS			AA	ZER
2	EA	MULLION SEAL	8780NBK PSA			BK	ZER
2	EA	DOOR SWEEP	39A			A	ZER
1	EA	THRESHOLD	655A - OR PER SILL DETAILS			A	ZER
2	EA	DOOR POSITION SWITCH	BY DIVISION 28.		✓	628	SCE

Hardware Group No. 63

For use on Door #(s):
B213B

Provide each FLD door(s) with the following:

QTY	DESCRIPTION	CATALOG NUMBER		FINISH	MFR
1		HARDWARE BY MANUFACTURER			

Hardware Group No. AL01

For use on Door #(s):

A132E	A132F	B157B	C110B	C112B	D104C
D104D	D128C	D128D			

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
1	EA	CONT. HINGE	027XY / 112XY (EPT AS REQUIRED)		628	IVE
1	EA	DUMMY PUSH BAR	350		626	VON
1	EA	90 DEG OFFSET PULL	8190EZHD 10" O		630-316	IVE
1	EA	OH STOP	100S ADJ		630	GLY
1	EA	SURFACE CLOSER	4040XP EDAW/62G		689	LCN
1	EA	CUSH SHOE SUPPORT	4040XP-30 SRT		689	LCN
1	EA	SEALS	BY ALUMINUM FRAME MANUFACTURER			

Hardware Group No. AL02

For use on Door #(s):

C112A	D128B	D139B	D141B	D146B

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
1	EA	CONT. HINGE	027XY / 112XY (EPT AS REQUIRED)		628	IVE
1	EA	PANIC HARDWARE	CD-98-NL-OP-110MD		626	VON
1	EA	FSIC RIM CYL. HOUSING	20-079		626	SCH
1	EA	MORTISE CYLINDER	26-094 (CAM & RING AS REQ'D)		626	SCH
2	EA	PERMANENT FSIC CORE	23-030 EV29 T		626	SCH
1	EA	90 DEG OFFSET PULL	8190EZHD 10" O		630-316	IVE
1	EA	OH STOP	100S ADJ		630	GLY
1	EA	SURFACE CLOSER	4040XP EDAW/62G		689	LCN
1	EA	CUSH SHOE SUPPORT	4040XP-30 SRT		689	LCN
1	EA	WEATHERSTRIPPING	BY ALUMINUM DOOR/FRAME MANUFACTURER.			
1	EA	DOOR SWEEP	39A		A	ZER
1	EA	THRESHOLD	655A - OR PER SILL DETAILS		A	ZER
1	EA	DOOR POSITION SWITCH	BY DIVISION 28.		628	SCE

HARDWARE IS FOR STROREFRONT SYSTEM WITH 2" THICK WIDE STILE DOORS. PROVIDE CONTINUOUS HINGE IVES 112XY AT 1-3/4" THICK DOOR
HARDWARE TO BE PROVIDED BY ALUMINUM DOOR CONTRACTOR

Hardware Group No. AL03

For use on Door #(s):

B111A	B112A	B113A	B114A	B124A	B128A
B129A	B140A	B142A	B147A	B148A	B149A

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER			FINISH	MFR
1	EA	CONT. HINGE	027XY / 112XY (EPT AS REQUIRED)			628	IVE
1	EA	VANDL ENTRANCE LOCK	ND92P6D RHO			626	SCH
1	EA	WALL STOP	WS401/402CCV			626	IVE
1	EA	SEALS	BY ALUMINUM FRAME MANUFACTURER				

Hardware Group No. AL04

For use on Door #(s):

B117A	B117B

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER			FINISH	MFR
1	EA	CONT. HINGE	027XY / 112XY (EPT AS REQUIRED)			628	IVE
1	EA	VANDL STOREROOM LOCK	ND96P6D RHO			626	SCH
1	EA	ELECTRIC STRIKE	1500 12/24 VDC FAIL SAFE			630	HES
1	EA	OH STOP	100S ADJ			630	GLY
1	EA	SURFACE CLOSER	4040XP EDAW/62G			689	LCN
1	EA	CUSH SHOE SUPPORT	4040XP-30 SRT			689	LCN
1	EA	WEATHERSTRIPPING	BY ALUMINUM DOOR/FRAME MANUFACTURER.				
1	EA	WIRE HARNESS	CON-XXXP (LENGTH AS REQUIRED) VERIFY LENGTH				SCH
1	EA	CREDENTIAL READER	BY DIVISION 28.				
1	EA	REMOTE RELEASE BUTTON	BY DIVISION 28.			628	SCE
1	EA	DOOR POSITION SWITCH	BY DIVISION 28.			628	SCE
1	EA	LOW VOLTAGE POWER	BY LOW VOLTAGE.				

HARDWARE IS FOR STROREFRONT SYSTEM WITH 2" THICK WIDE STILE DOORS. PROVIDE CONTINUOUS HINGE IVES 112XY AT 1-3/4" THICK DOOR
HARDWARE TO BE PROVIDED BY ALUMINUM DOOR CONTRACTOR

OPERATION:
DOOR IS NORMALLY LATCHED AND SECURED
PRESENTING VALID CREDENTIAL OR PUSHING REMOTE RELEASE BUTTON TEMPORARILY RELEASES STRIKE FOR ENTRY
DOOR IS SECURED UPON LOSS OF POWER TO THE STRIKE
FREE EGRESS AT ALL TIMES

Hardware Group No. AL05

For use on Door #(s):
B137A B138A B209A B213A B216A

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
1	EA	CONT. HINGE	027XY / 112XY (EPT AS REQUIRED)		628	IVE
1	EA	VANDL ENTRANCE LOCK	ND92P6D RHO		626	SCH
1	EA	OH STOP	100S ADJ		630	GLY
1	EA	SURFACE CLOSER	4040XP		689	LCN
1	EA	SEALS	BY ALUMINUM FRAME MANUFACTURER			

Hardware Group No. AL06

For use on Door #(s):
B143A

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
1	EA	CONT. HINGE	027XY / 112XY (EPT AS REQUIRED)		628	IVE
1	EA	PANIC HARDWARE	CD-98-NL-OP-110MD		626	VON
1	EA	FSIC RIM CYL. HOUSING	20-079		626	SCH
1	EA	MORTISE CYLINDER	26-094 (CAM & RING AS REQ'D)		626	SCH
2	EA	PERMANENT FSIC CORE	23-030 EV29 T		626	SCH
1	EA	ELECTRIC STRIKE	9500 FSE 12/24VDC		630	HES
1	EA	90 DEG OFFSET PULL	8190EZHD 10" O		630-316	IVE
1	EA	OH STOP	100S ADJ		630	GLY
1	EA	SURFACE CLOSER	4040XP EDAW/62G		689	LCN
1	EA	CUSH SHOE SUPPORT	4040XP-30 SRT		689	LCN
1	EA	WEATHERSTRIPPING	BY ALUMINUM DOOR/FRAME MANUFACTURER.			
1	EA	WIRE HARNESS	CON-XXXP (LENGTH AS REQUIRED) VERIFY LENGTH			SCH
1	EA	CREDENTIAL READER	BY DIVISION 28.			
1	EA	DOOR POSITION SWITCH	BY DIVISION 28.		628	SCE
1	EA	LOW VOLTAGE POWER	BY LOW VOLTAGE.			

HARDWARE IS FOR STROREFRONT SYSTEM WITH 2" THICK WIDE STILE DOORS. PROVIDE CONTINUOUS HINGE IVES 112XY AT 1-3/4" THICK DOOR
HARDWARE TO BE PROVIDED BY ALUMINUM DOOR CONTRACTOR

OPERATION:
DOOR IS NORMALLY LATCHED AND SECURED
PRESENTING VALID CREDENTIAL TEMPORARILY RELEASES STRIKE FOR ENTRY
DOOR IS SECURED UPON LOSS OF POWER TO THE STRIKE
FREE EGRESS AT ALL TIMES

Hardware Group No. AL07

For use on Door #(s):
B143B

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER			FINISH	MFR
1	EA	CONT. HINGE	027XY / 112XY (EPT AS REQUIRED)			628	IVE
1	EA	PANIC HARDWARE	CD-98-NL-OP-110MD			626	VON
1	EA	FSIC RIM CYL. HOUSING	20-079			626	SCH
1	EA	MORTISE CYLINDER	26-094 (CAM & RING AS REQ'D)			626	SCH
2	EA	PERMANENT FSIC CORE	23-030 EV29 T			626	SCH
1	EA	ELECTRIC STRIKE	9500 FSE 12/24VDC		✓	630	HES
1	EA	90 DEG OFFSET PULL	8190EZHD 10" O			630-316	IVE
1	EA	OH STOP	100S ADJ			630	GLY
1	EA	SURFACE CLOSER	4040XP EDAW/62G			689	LCN
1	EA	CUSH SHOE SUPPORT	4040XP-30 SRT			689	LCN
1	EA	WEATHERSTRIPPING	BY ALUMINUM DOOR/FRAME MANUFACTURER.				
1	EA	WIRE HARNESS	CON-XXXP (LENGTH AS REQUIRED) VERIFY LENGTH		✓		SCH
1	EA	CREDENTIAL READER	BY DIVISION 28.		✓		
1	EA	REMOTE RELEASE BUTTON	BY DIVISION 28.		✓	628	SCE
1	EA	DOOR POSITION SWITCH	BY DIVISION 28.		✓	628	SCE
1	EA	LOW VOLTAGE POWER	BY LOW VOLTAGE.		✓		

HARDWARE IS FOR STROREFRONT SYSTEM WITH 2" THICK WIDE STILE DOORS. PROVIDE CONTINUOUS HINGE IVES 112XY AT 1-3/4" THICK DOOR
HARDWARE TO BE PROVIDED BY ALUMINUM DOOR CONTRACTOR

OPERATION:
DOOR IS NORMALLY LATCHED AND SECURED
PRESENTING VALID CREDENTIAL OR PUSHING REMOTE RELEASE BUTTON TEMPORARILY RELEASES STRIKE FOR ENTRY
DOOR IS SECURED UPON LOSS OF POWER TO THE STRIKE
FREE EGRESS AT ALL TIMES

Hardware Group No. AL08

For use on Door #(s):

A132D	B157A	C110A	C123B	C130B	D104A
D128A	F111A				

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
1	EA	CONT. HINGE	027XY / 112XY (EPT AS REQUIRED)		628	IVE
1	EA	PANIC HARDWARE	CD-98-NL-OP-110MD		626	VON
1	EA	FSIC RIM CYL. HOUSING	20-079		626	SCH
1	EA	MORTISE CYLINDER	26-094 (CAM & RING AS REQ'D)		626	SCH
2	EA	PERMANENT FSIC CORE	23-030 EV29 T		626	SCH
1	EA	ELECTRIC STRIKE	9500 FSE 12/24VDC		630	HES
1	EA	90 DEG OFFSET PULL	8190EZHD 10" O		630-316	IVE
1	EA	OH STOP	100S ADJ		630	GLY
1	EA	SURFACE CLOSER	4040XP EDAW/62G		689	LCN
1	EA	CUSH SHOE SUPPORT	4040XP-30 SRT		689	LCN
1	EA	WEATHERSTRIPPING	BY ALUMINUM DOOR/FRAME MANUFACTURER.			
1	EA	DOOR SWEEP	39A		A	ZER
1	EA	THRESHOLD	655A - OR PER SILL DETAILS		A	ZER
1	EA	WIRE HARNESS	CON-XXXP (LENGTH AS REQUIRED) VERIFY LENGTH			SCH
1	EA	CREDENTIAL READER	BY DIVISION 28.			
1	EA	DOOR POSITION SWITCH	BY DIVISION 28.		628	SCE
1	EA	LOW VOLTAGE POWER	BY LOW VOLTAGE.			

HARDWARE IS FOR STROREFRONT SYSTEM WITH 2" THICK WIDE STILE DOORS. PROVIDE CONTINUOUS HINGE IVES 112XY AT 1-3/4" THICK DOOR
HARDWARE TO BE PROVIDED BY ALUMINUM DOOR CONTRACTOR

OPERATION:
DOOR IS NORMALLY LATCHED AND SECURED
PRESENTING VALID CREDENTIAL TEMPORARILY RELEASES STRIKE FOR ENTRY
DOOR IS SECURED UPON LOSS OF POWER TO THE STRIKE
FREE EGRESS AT ALL TIMES

Hardware Group No. AL09

For use on Door #(s):
B159A

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER			FINISH	MFR
1	EA	CONT. HINGE	027XY / 112XY (EPT AS REQUIRED)			628	IVE
1	EA	PANIC HARDWARE	CD-98-NL-OP-110MD			626	VON
1	EA	FSIC RIM CYL. HOUSING	20-079			626	SCH
1	EA	MORTISE CYLINDER	26-094 (CAM & RING AS REQ'D)			626	SCH
2	EA	PERMANENT FSIC CORE	23-030 EV29 T			626	SCH
1	EA	ELECTRIC STRIKE	9500 FSE 12/24VDC		✓	630	HES
1	EA	90 DEG OFFSET PULL	8190EZHD 10" O			630-316	IVE
1	EA	OH STOP	100S ADJ			630	GLY
1	EA	SURFACE CLOSER	4040XP EDAW/62G			689	LCN
1	EA	CUSH SHOE SUPPORT	4040XP-30 SRT			689	LCN
1	EA	WEATHERSTRIPPING	BY ALUMINUM DOOR/FRAME MANUFACTURER.				
1	EA	DOOR SWEEP	39A			A	ZER
1	EA	THRESHOLD	655A - OR PER SILL DETAILS			A	ZER
1	EA	WIRE HARNESS	CON-XXXP (LENGTH AS REQUIRED) VERIFY LENGTH		✓		SCH
1	EA	CREDENTIAL READER	BY DIVISION 28.		✓		
1	EA	INTERCOM	BY OWNER		✓		
1	EA	REMOTE RELEASE BUTTON	BY DIVISION 28.		✓	628	SCE
1	EA	DOOR POSITION SWITCH	BY DIVISION 28.		✓	628	SCE
1	EA	LOW VOLTAGE POWER	BY LOW VOLTAGE.		✓		

HARDWARE IS FOR STROREFRONT SYSTEM WITH 2" THICK WIDE STILE DOORS. PROVIDE CONTINUOUS HINGE IVES 112XY AT 1-3/4" THICK DOOR
HARDWARE TO BE PROVIDED BY ALUMINUM DOOR CONTRACTOR

OPERATION:
DOOR IS NORMALLY LATCHED AND SECURED
PRESENTING VALID CREDENTIAL TEMPORARILY RELEASES STRIKE FOR ENTRY
DOOR IS SECURED UPON LOSS OF POWER TO THE STRIKE
FREE EGRESS AT ALL TIMES

Hardware Group No. AL10

For use on Door #(s):
B212A B212B

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
1	EA	CONT. HINGE	027XY / 112XY (EPT AS REQUIRED)		628	IVE
1	EA	PANIC HARDWARE	CD-98-NL-OP-110MD		626	VON
1	EA	FSIC RIM CYL. HOUSING	20-079		626	SCH
1	EA	MORTISE CYLINDER	26-094 (CAM & RING AS REQ'D)		626	SCH
2	EA	PERMANENT FSIC CORE	23-030 EV29 T		626	SCH
1	EA	90 DEG OFFSET PULL	8190EZHD 10" O		630-316	IVE
1	EA	OH STOP	100S ADJ		630	GLY
1	EA	SURFACE CLOSER	4040XP EDAW/62G		689	LCN
1	EA	CUSH SHOE SUPPORT	4040XP-30 SRT		689	LCN
1	EA	WEATHERSTRIPPING	BY ALUMINUM DOOR/FRAME MANUFACTURER.			

HARDWARE IS FOR STROREFRONT SYSTEM WITH 2" THICK WIDE STILE DOORS. PROVIDE CONTINUOUS HINGE IVES 112XY AT 1-3/4" THICK DOOR
HARDWARE TO BE PROVIDED BY ALUMINUM DOOR CONTRACTOR

Hardware Group No. AL11

For use on Door #(s):
B159C

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
1	EA	CONT. HINGE	027XY / 112XY (EPT AS REQUIRED)		628	IVE
1	EA	POWER TRANSFER	EPT10 CON		689	VON
1	EA	ELEC PANIC HARDWARE	RX-QEL-98-NL-OP-110MD-CON 24 VDC		626	VON
1	EA	FSIC RIM CYL. HOUSING	20-079		626	SCH
1	EA	PERMANENT FSIC CORE	23-030 EV29 T		626	SCH
1	EA	90 DEG OFFSET PULL	8190EZHD 10" O		630-316	IVE
1	EA	OH STOP	100SE ADJ		630	GLY
1	EA	SURF. AUTO OPERATOR	4642 TBWMS 120 VAC		689	LCN
1	EA	ACTUATOR KIT (WALL MOUNT)	8310-3853TWF		630	LCN
1	EA	DIRECTIONAL ACTUATOR KIT (WALL MOUNT)	8310-3855WF		630	LCN
1	EA	RECEIVER	8310-865			LCN
1	EA	WEATHERSTRIPPING	BY ALUMINUM DOOR/FRAME MANUFACTURER.			
1	EA	DOOR SWEEP	39A		A	ZER
1	EA	THRESHOLD	655A - OR PER SILL DETAILS		A	ZER
1	EA	WIRE HARNESS	CON-XXXP (LENGTH AS REQUIRED) VERIFY LENGTH			SCH
1	EA	LOW VOLTAGE POWER	BY LOW VOLTAGE.			

HARDWARE IS FOR STROREFRONT SYSTEM WITH 2" THICK WIDE STILE DOORS. PROVIDE CONTINUOUS HINGE IVES 112XY AT 1-3/4" THICK DOOR
HARDWARE TO BE PROVIDED BY ALUMINUM DOOR CONTRACTOR

Hardware Group No. AL12

For use on Door #(s):
B159B

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
1	EA	CONT. HINGE	027XY / 112XY (EPT AS REQUIRED)		628	IVE
1	EA	POWER TRANSFER	EPT10 CON		689	VON
1	EA	ELEC PANIC HARDWARE	RX-QEL-98-NL-OP-110MD-CON 24 VDC		626	VON
1	EA	FSIC RIM CYL. HOUSING	20-079		626	SCH
1	EA	PERMANENT FSIC CORE	23-030 EV29 T		626	SCH
1	EA	90 DEG OFFSET PULL	8190EZHD 10" O		630-316	IVE
1	EA	OH STOP	100S ADJ		630	GLY
1	EA	SURFACE CLOSER	4040XP EDAW/62G		689	LCN
1	EA	WEATHERSTRIPPING	BY ALUMINUM DOOR/FRAME MANUFACTURER.			
1	EA	DOOR SWEEP	39A		A	ZER
1	EA	THRESHOLD	655A - OR PER SILL DETAILS		A	ZER
1	EA	WIRE HARNESS	CON-XXXP (LENGTH AS REQUIRED) VERIFY LENGTH			SCH
1	EA	LOW VOLTAGE POWER	BY LOW VOLTAGE.			

HARDWARE IS FOR STROREFRONT SYSTEM WITH 2" THICK WIDE STILE DOORS. PROVIDE CONTINUOUS HINGE IVES 112XY AT 1-3/4" THICK DOOR
HARDWARE TO BE PROVIDED BY ALUMINUM DOOR CONTRACTOR

Hardware Group No. AL13

For use on Door #(s):
B159E

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
1	EA	CONT. HINGE	027XY / 112XY (EPT AS REQUIRED)		628	IVE
1	EA	POWER TRANSFER	EPT10 CON		689	VON
1	EA	ELEC PANIC HARDWARE	RX-QEL-98-NL-OP-110MD-CON 24 VDC		626	VON
1	EA	FSIC RIM CYL. HOUSING	20-079		626	SCH
1	EA	PERMANENT FSIC CORE	23-030 EV29 T		626	SCH
1	EA	90 DEG OFFSET PULL	8190EZHD 10" O		630-316	IVE
1	EA	OH STOP	100SE ADJ		630	GLY
1	EA	SURF. AUTO OPERATOR	4642 TBWMS 120 VAC		689	LCN
1	EA	ACTUATOR KIT (WALL MOUNT)	8310-3853TWF		630	LCN
1	EA	DIRECTIONAL ACTUATOR KIT (WALL MOUNT)	8310-3855WF		630	LCN
1	EA	RECEIVER	8310-865			LCN
1	EA	WEATHERSTRIPPING	BY ALUMINUM DOOR/FRAME MANUFACTURER.			
1	EA	WIRE HARNESS	CON-XXXP (LENGTH AS REQUIRED) VERIFY LENGTH			SCH
1	EA	LOW VOLTAGE POWER	BY LOW VOLTAGE.			

HARDWARE IS FOR STROREFRONT SYSTEM WITH 2" THICK WIDE STILE DOORS. PROVIDE CONTINUOUS HINGE IVES 112XY AT 1-3/4" THICK DOOR
HARDWARE TO BE PROVIDED BY ALUMINUM DOOR CONTRACTOR

Hardware Group No. AL14

For use on Door #(s):
B159D

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
1	EA	CONT. HINGE	027XY / 112XY (EPT AS REQUIRED)		628	IVE
1	EA	POWER TRANSFER	EPT10 CON		689	VON
1	EA	ELEC PANIC HARDWARE	RX-QEL-98-NL-OP-110MD-CON 24 VDC		626	VON
1	EA	FSIC RIM CYL. HOUSING	20-079		626	SCH
1	EA	PERMANENT FSIC CORE	23-030 EV29 T		626	SCH
1	EA	90 DEG OFFSET PULL	8190EZHD 10" O		630-316	IVE
1	EA	OH STOP	100S ADJ		630	GLY
1	EA	SURFACE CLOSER	4040XP EDAW/62G		689	LCN
1	EA	WEATHERSTRIPPING	BY ALUMINUM DOOR/FRAME MANUFACTURER.			
1	EA	WIRE HARNESS	CON-XXXP (LENGTH AS REQUIRED) VERIFY LENGTH			SCH
1	EA	REMOTE RELEASE BUTTON	BY DIVISION 28.		628	SCE
1	EA	LOW VOLTAGE POWER	BY LOW VOLTAGE.			

HARDWARE IS FOR STROREFRONT SYSTEM WITH 2" THICK WIDE STILE DOORS. PROVIDE CONTINUOUS HINGE IVES 112XY AT 1-3/4" THICK DOOR
HARDWARE TO BE PROVIDED BY ALUMINUM DOOR CONTRACTOR

Hardware Group No. AL15

For use on Door #(s):
C104A

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER			FINISH	MFR
1	EA	CONT. HINGE	027XY / 112XY (EPT AS REQUIRED)			628	IVE
1	EA	FIRE EXIT HARDWARE	98-NL-OP-F-110MD			626	VON
1	EA	FSIC RIM CYL. HOUSING	20-079			626	SCH
1	EA	MORTISE CYLINDER	26-094 (CAM & RING AS REQ'D)			626	SCH
2	EA	PERMANENT FSIC CORE	23-030 EV29 T			626	SCH
1	EA	ELECTRIC STRIKE	9500 FSE 12/24VDC		✓	630	HES
1	EA	90 DEG OFFSET PULL	8190EZHD 10" O			630-316	IVE
1	EA	SURFACE CLOSER	4040XP EDA			689	LCN
1	EA	CUSH SHOE SUPPORT	4040XP-30 SRT			689	LCN
1	EA	MAGNETIC DOOR HOLDER	SEM7850 12V/24V/120V		✓	689	LCN
1	EA	WEATHERSTRIPPING	BY ALUMINUM DOOR/FRAME MANUFACTURER.				
1	EA	WIRE HARNESS	CON-XXXP (LENGTH AS REQUIRED) VERIFY LENGTH		✓		SCH
1	EA	CREDENTIAL READER	BY DIVISION 28.		✓		
1	EA	DOOR POSITION SWITCH	BY DIVISION 28.		✓	628	SCE
1	EA	LOW VOLTAGE POWER	BY LOW VOLTAGE.		✓		

HARDWARE IS FOR STROREFRONT SYSTEM WITH 2" THICK WIDE STILE DOORS. PROVIDE CONTINUOUS HINGE IVES 112XY AT 1-3/4" THICK DOOR
HARDWARE TO BE PROVIDED BY ALUMINUM DOOR CONTRACTOR

MAG HOLD OPEN, ON LOSS OF POWER AND/OR ACTIVATION OF FIRE ALARM SYSTEM DOORS TO RELEASE TO CLOSE AND LATCH.
DOOR IS NORMALLY LATCHED AND SECURED
PRESENTING VALID CREDENTIAL TEMPORARILY RELEASES STRIKE FOR ENTRY
DOOR IS SECURED UPON LOSS OF POWER TO THE STRIKE
FREE EGRESS AT ALL TIMES

Hardware Group No. AL16

For use on Door #(s):
B214A B215A

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
1	EA	CONT. HINGE	027XY / 112XY (EPT AS REQUIRED)		628	IVE
1	EA	VANDL ENTRANCE LOCK	ND92P6D RHO		626	SCH
1	EA	OH STOP	100S ADJ		630	GLY
1	EA	SURFACE CLOSER	4040XP EDAW/62G		689	LCN
1	EA	CUSH SHOE SUPPORT	4040XP-30 SRT		689	LCN
1	EA	SEALS	BY ALUMINUM FRAME MANUFACTURER			

Hardware Group No. AL17

For use on Door #(s):
C104B

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
1	EA	CONT. HINGE	027XY / 112XY (EPT AS REQUIRED)		628	IVE
1	EA	FIRE EXIT HARDWARE	98-NL-OP-F-110MD		626	VON
1	EA	FSIC RIM CYL. HOUSING	20-079		626	SCH
1	EA	MORTISE CYLINDER	26-094 (CAM & RING AS REQ'D)		626	SCH
2	EA	PERMANENT FSIC CORE	23-030 EV29 T		626	SCH
1	EA	90 DEG OFFSET PULL	8190EZHD 10" O		630-316	IVE
1	EA	SURFACE CLOSER	4040XP EDA		689	LCN
1	EA	CUSH SHOE SUPPORT	4040XP-30 SRT		689	LCN
1	EA	MAGNETIC DOOR HOLDER	SEM7850 12V/24V/120V		689	LCN
1	EA	WEATHERSTRIPPING	BY ALUMINUM DOOR/FRAME MANUFACTURER.			

HARDWARE IS FOR STROREFRONT SYSTEM WITH 2" THICK WIDE STILE DOORS. PROVIDE CONTINUOUS HINGE IVES 112XY AT 1-3/4" THICK DOOR
HARDWARE TO BE PROVIDED BY ALUMINUM DOOR CONTRACTOR

MAG HOLD OPEN, ON LOSS OF POWER AND/OR ACTIVATION OF FIRE ALARM SYSTEM DOORS TO RELEASE TO CLOSE AND LATCH.

Hardware Group No. AL18

For use on Door #(s):
A110A

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
1	EA	CONT. HINGE	027XY / 112XY (EPT AS REQUIRED)		628	IVE
1	EA	PANIC HARDWARE	CD-98-EO		626	VON
1	EA	MORTISE CYLINDER	26-094 (CAM & RING AS REQ'D)		626	SCH
1	EA	PERMANENT FSIC CORE	23-030 EV29 T		626	SCH
1	EA	90 DEG OFFSET PULL	8190EZHD 10" O		630-316	IVE
1	EA	OH STOP	100S ADJ		630	GLY
1	EA	SURFACE CLOSER	4040XP EDAW/62G		689	LCN
1	EA	CUSH SHOE SUPPORT	4040XP-30 SRT		689	LCN
1	EA	WEATHERSTRIPPING	BY ALUMINUM DOOR/FRAME MANUFACTURER.			
1	EA	DOOR SWEEP	BY ALUMINUM DOOR/FRAME MANUFACTURER.			
1	EA	THRESHOLD	BY ALUMINUM DOOR/FRAME MANUFACTURER.			
1	EA	DOOR POSITION SWITCH	BY DIVISION 28.		628	SCE

HARDWARE IS FOR STROREFRONT SYSTEM WITH 2" THICK WIDE STILE DOORS. PROVIDE CONTINUOUS HINGE IVES 112XY AT 1-3/4" THICK DOOR
HARDWARE TO BE PROVIDED BY ALUMINUM DOOR CONTRACTOR

Hardware Group No. AL19

For use on Door #(s):
A132A A132B A132C

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
1	EA	CONT. HINGE	027XY / 112XY (EPT AS REQUIRED)		628	IVE
1	EA	PANIC HARDWARE	CD-98-EO		626	VON
1	EA	MORTISE CYLINDER	26-094 (CAM & RING AS REQ'D)		626	SCH
1	EA	PERMANENT FSIC CORE	23-030 EV29 T		626	SCH
1	EA	90 DEG OFFSET PULL	8190EZHD 10" O		630-316	IVE
1	EA	OH STOP	100S ADJ		630	GLY
1	EA	SURFACE CLOSER	4040XP EDAW/62G		689	LCN
1	EA	CUSH SHOE SUPPORT	4040XP-30 SRT		689	LCN
1	EA	WEATHERSTRIPPING	BY ALUMINUM DOOR/FRAME MANUFACTURER.			
1	EA	DOOR SWEEP	39A		A	ZER
1	EA	THRESHOLD	655A - OR PER SILL DETAILS		A	ZER
1	EA	DOOR POSITION SWITCH	BY DIVISION 28.		628	SCE

HARDWARE IS FOR STROREFRONT SYSTEM WITH 2" THICK WIDE STILE DOORS. PROVIDE CONTINUOUS HINGE IVES 112XY AT 1-3/4" THICK DOOR
HARDWARE TO BE PROVIDED BY ALUMINUM DOOR CONTRACTOR

Hardware Group No. AL20

For use on Door #(s):
D104B

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
1	EA	CONT. HINGE	027XY / 112XY (EPT AS REQUIRED)		628	IVE
1	EA	PANIC HARDWARE	CD-98-NL-OP-110MD		626	VON
1	EA	FSIC RIM CYL. HOUSING	20-079		626	SCH
1	EA	MORTISE CYLINDER	26-094 (CAM & RING AS REQ'D)		626	SCH
2	EA	PERMANENT FSIC CORE	23-030 EV29 T		626	SCH
1	EA	ELECTRIC STRIKE	9500 FSE 12/24VDC		630	HES
1	EA	90 DEG OFFSET PULL	8190EZHD 10" O		630-316	IVE
1	EA	OH STOP	100S ADJ		630	GLY
1	EA	SURFACE CLOSER	4040XP EDAW/62G		689	LCN
1	EA	CUSH SHOE SUPPORT	4040XP-30 SRT		689	LCN
1	EA	WEATHERSTRIPPING	BY ALUMINUM DOOR/FRAME MANUFACTURER.			
1	EA	DOOR SWEEP	39A		A	ZER
1	EA	THRESHOLD	655A - OR PER SILL DETAILS		A	ZER
1	EA	WIRE HARNESS	CON-XXXP (LENGTH AS REQUIRED) VERIFY LENGTH			SCH
1	EA	DOOR POSITION SWITCH	BY DIVISION 28.		628	SCE
1	EA	LOW VOLTAGE POWER	BY LOW VOLTAGE.			

HARDWARE IS FOR STROREFRONT SYSTEM WITH 2" THICK WIDE STILE DOORS. PROVIDE CONTINUOUS HINGE IVES 112XY AT 1-3/4" THICK DOOR
HARDWARE TO BE PROVIDED BY ALUMINUM DOOR CONTRACTOR

DOOR IS NORMALLY LOCKED. RESTRICTING ENTRY.
ELECTRIC STRIKE TO ALLOW ENTRY OR BY KEY.
INSIDE TOUCHBAR ALWAYS ALLOWS EGRESS.

Hardware Group No. OH01

For use on Door #(s):

A111A	A111B	A111C	A111D	A120B	A121B
B108B	B108C	B209B	C105C	C105D	C128B
C128E	C128F	C128G	F107B	F107D	F108B
F108C	F110B	F110C	N101B	N105B	N302A
N403A					

Provide each RU door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
	EA	NOTE	HARDWARE BY ROLLUP DOOR MANUFACTURER			

END OF SECTION

SECTION 08 8000

GLAZING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Furnish all labor, materials, equipment, tools, and services required to fully complete all Glazing work as is indicated on the drawings and/or specified herein including, but not limited to, the following described items.
B. Insulating glass units.
C. Spandrel glass units
D. Glazing units.
E. Fire-rated glazing.
F. Glazing compounds.
G. Do not include sales tax, refer to Section 00 1115 - Advertisement for Prequalification of Bidders.

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, borrowed lites, and transoms.
C. Section 08 1416 - Flush Wood Doors: Glazed lites in doors.
D. Section 08 4313 - Aluminum-Framed Storefronts: Glazing provided as part of storefront assembly.
E. Section 08 4413 - Glazed Aluminum Curtain Wall: Glazing provided as part of wall assembly.
F. Section 08 5113 - Aluminum Windows: Glazing provided by window manufacturer.

1.03 REFERENCE STANDARDS

A. 16 CFR 1201 - Safety Standard for Architectural Glazing Materials; Current Edition.
B. ANSI Z97.1 - American National Standard for Safety Glazing Materials Used in Buildings - Safety Performance Specifications and Methods of Test; 2015 (Reaffirmed 2020).
C. ASCE 7 - Minimum Design Loads and Associated Criteria for Buildings and Other Structures; Most Recent Edition Cited by Referring Code or Reference Standard.
D. ASTM C864 - Standard Specification for Dense Elastomeric Compression Seal Gaskets, Setting Blocks, and Spacers; 2005 (Reapproved 2015).
E. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2018.
F. ASTM C1036 - Standard Specification for Flat Glass; 2021.
G. ASTM C1048 - Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass; 2018.
H. ASTM C1172 - Standard Specification for Laminated Architectural Flat Glass; 2019.
I. ASTM C1193 - Standard Guide for Use of Joint Sealants; 2016.
J. ASTM C1376 - Standard Specification for Pyrolytic and Vacuum Deposition Coatings on Flat Glass; 2021a.
K. ASTM E1300 - Standard Practice for Determining Load Resistance of Glass in Buildings; 2016.
L. ASTM E2190 - Standard Specification for Insulating Glass Unit Performance and Evaluation; 2019.
M. GANA (GM) - GANA Glazing Manual; 2008.
N. GANA (SM) - GANA Sealant Manual; 2008.

O. ICC (IBC) - International Building Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
P. NFRC 100 - Procedure for Determining Fenestration Product U-factors; 2020.
Q. NFRC 200 - Procedure for Determining Fenestration Product Solar Heat Gain Coefficient and Visible Transmittance at Normal Incidence; 2020.
R. NFRC 300 - Test Method for Determining the Solar Optical Properties of Glazing Materials and Systems; 2020.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene a preinstallation meeting one week before starting work of this section; require attendance by each of the affected installers.

1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.
B. Product Data on Insulating Glass Unit and Glazing Unit Glazing Types: Provide structural, physical and environmental characteristics, size limitations, special handling and installation requirements.
C. Product Data on Glazing Compounds and Accessories: Provide chemical, functional, and environmental characteristics, limitations, special application requirements, and identify available colors.
D. Samples: Submit two samples 12 by 12 inch in sizeof glass units, showing coloration and design.
E. Manufacturer's Certificate: Certify that glass and glazing products meets or exceeds specified requirements.
    1. Refer to Sections 08 4313 and 08 4413 for assembly thermal performance compliance and certification.
F. Warranty Documentation: Submit manufacturer warranty and ensure that forms have been completed in Murray City School District 's name and registered with manufacturer.

1.06 QUALITY ASSURANCE

A. Perform Work in accordance with GANA (GM) and GANA (SM) for glazing installation methods. Maintain one copy on site.
B. Provide glass obtained from a single source.
C. Provide compatibilty and adhesion testing for glazing tapes, gaskets, sealants and other accessories. Prior test reports may be acceptable in lieu of testing.
D. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years of documented experience.
E. Installer Qualifications: Company specializing in performing the work of this section with minimum five yearsdocumented experience.
F. Testing Agency Qualifications: Independent firm specializing in performing testing and inspections of the type specified in this section.
G. Glazing shall withstand normal thermal movement, wind and impact loads (where applicable) without failure.

1.07 MOCK-UPS

A. See Section 01 4000 - Quality Requirements for additional requirements.
B. Provide on-site glazing mock-up with the specified glazing components.
C. Locate where directed.
D. Mock-ups may remain as part of the Work, if undisturbed at time of substantial completion at the discretion of the Architect.

1.08 FIELD CONDITIONS

A. Do not install glazing when ambient temperature is less than 50 degrees F.
B. Maintain minimum ambient temperature before, during and 24 hours after installation of glazing compounds.

1.09 WARRANTY

A. See Section 01 7800 - Closeout Submittals for additional warranty requirements.
B. Insulating Glass Units: Provide a five (5) year manufacturer warranty to include coverage for seal failure, interpane dusting or misting, including providing products to replace failed units.
C. Laminated Glass: Provide a five (5) year manufacturer warranty to include coverage for delamination, including providing products to replace failed units.
D. The Contractor shall guarantee his work for a period of One (1) year from date of Substantial Completion. Guarantee shall be on form included in Section 01 7800.
E. Heat Soaked Tempered Glass: Provide a five (5) year manufacturer warranty to include coverage for spontaneous breakage of fully tempered glass caused by nickel sulfide (NiS) inclusions.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Glass Fabricators:
    1. GGI - General Glass International: www.generalglass.com.
    2. JE Berkowitz, LP: www.jeberkowitz.com.
    3. Standard Bent Glass Corp: www.standardbent.com.
    4. Thompson I.G., LLC: www.thompsonig.com.
    5. Trulite Glass & Aluminum Solutions, LLC: www.trulite.com.
    6. Viracon, Inc: www.viracon.com.
    7. Substitutions: See Section 01 6000 - Product Requirements.
B. Float Glass Manufacturers:
    1. AGC Glass North America, Inc: www.agcglass.com.
    2. Cardinal Glass Industries: www.cardinalcorp.com.
    3. Guardian Glass, LLC: www.guardianglass.com.
    4. Pilkington North America Inc: www.pilkington.com/na.
    5. Vitro Architectural Glass: www.vitroglazings.com.
    6. Substitutions: See Section 01 6000 - Product Requirements.
C. Laminated Glass Manufacturers:
    1. Cardinal Glass Industries: www.cardinalcorp.com.
    2. Viracon, Architectural Glass segment of Apogee Enterprises, Inc: www.viracon.com.
    3. Trulite Glass & Aluminum Solutions, LLC: www.trulite.com.
    4. Substitutions: See Section 01 6000 - Product Requirements.

2.02 PERFORMANCE REQUIREMENTS - EXTERIOR GLAZING ASSEMBLIES

A. Provide type and thickness of exterior glazing assemblies to support assembly dead loads, and to withstand live loads caused by positive and negative wind pressure acting normal to plane of glass.
    1. Design Pressure: Calculated in accordance with ASCE 7.
    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 1/200 of their lengths under specified design load.
5. Glass thicknesses listed are minimum.

B. Weather-Resistive Barrier Seals: Provide completed assemblies that maintain continuity of building enclosure water-resistive barrier, vapor retarder, and/or air barrier.
1. In conjunction with weather barrier related materials described in other sections, as follows:
2. To utilize inner pane of multiple pane insulating glass units for continuity of vapor retarder and/or air barrier seal.
3. To maintain a continuous vapor retarder and/or air barrier throughout glazed assembly from glass pane to heel bead of glazing sealant.

C. Thermal and Optical Performance: Provide exterior glazing products with performance properties as indicated. Performance properties are in accordance with manufacturer's published data as determined with the following procedures and/or test methods:
1. Center of Glass U-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.
3. Solar Optical Properties: Comply with NFRC 300 test method.

D. Refer to Sections 08 4313 and/or 08 4413 for Assembly Thermal Performance Compliance and Certification.

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.
2. Kind HS - Heat-Strengthened Type: Complies with ASTM C1048.
3. Kind FT - Fully Tempered Type: Complies with ASTM C1048.
4. Fully Tempered Safety Glass: Complies with ANSI Z97.1 or 16 CFR 1201 criteria for safety glazing used in hazardous locations.
5. Heat-Soak Testing (HST): Provide HST of fully tempered glass used on canopy, point-supported, spider wall, high-risk, sloping overhead, horizontal overhead, free-standing glass protective barrier, or other demanding applications of project, to reduce risks of spontaneous breakage due to nickel sulfide (NiS) induced fractures in accordance with industry established testing requirements.
6. Impact Resistant Safety Glass: Complies with ANSI Z97.1 - Class B, or 16 CFR 1201 - Category I criteria.
7. Sputter-Coated Float Glass: ASTM C1376, float glass with metallic oxide or nitride coating deposited by vacuum deposition process following primary glass product manufacturer.
8. Ceramic-Coated Vision Glass: Float glass with silk-screened ceramic enamel application, per ASTM C 1048, Condition B, Type I, Quality-Q3, and Specification No. 95-1-31 in GANA 'Engineering Standards Manual.'
9. Ceramic-Coated Spandrel Glass: ASTM C 1048, Condition B, Type I, Quality-Q3 and GANA 'Engineering Standards Manual' 66-9-20 Specification for Heat-Strengthened or Fully Tempered Ceramic Enameled Spandrel Glass for Use in Building Window/Curtain Walls and Other Architectural Applications.
10. Coated Spandrel Float Glass: Float glass complying with ASTM C 1048, GANA 'Engineering Standards Manual' 89-1-6 Specification for Environmental Durability of Fully Tempered or Heat-Strengthened Spandrel Glass with Applied Opacifier and other requirements specified, with manufacturer’s standard opacifier material on coated second surface of lites.

11. Thicknesses: As indicated; provide greater thickness as required for exterior glazing wind load design.

B. Laminated Glass: Float glass laminated in accordance with ASTM C1172.
   1. Laminated Safety Glass: Complies with ANSI Z97.1 - Class A and 16 CFR 1201 - Category II impact test requirements.
   2. Where fully tempered is specified or required, provide glass that has been tempered by the tong-less horizontal method.
   3. Polyvinyl Butyral (PVB) Interlayer: 0.030 inch thick, minimum.

C. Fire-Protection-Rated Glazing:
   1. IBC Fire Protection Rating: As indicated on drawings.
   2. Safety Certification: 16 CFR 1201 Category II.
   3. Products:
      a. SAFTI FIRST, a division of O'Keeffe's Inc; SuperLite X-90: www.safti.com.
      b. SCHOTT North America Inc; Pyran Platinum L: www.us.schott.com.
      c. Vetrotech Saint-Gobain North America; Keralite L: www.vetrotechusa.com.
      d. Vetrotech Saint-Gobain North America; Contraflam: www.vetrotechusa.com.
      e. Substitutions: Refer to Section 01 6000 - Product Requirements.

2.04 SEALED INSULATING GLASS UNITS

A. Manufacturers:
   1. Glass: Any of the manufacturers specified for float glass.
   2. AGC Glass North America, Inc: www.agcglass.com.
   3. Northwestern Industries, Inc. www.nwiglass.com
   4. Viracon, Apogee Enterprises, Inc: www.viracon.com.
   5. Oldcastle BuildingEnvelope. www.obe.com.
   6. Substitutions: See Section 01 6000 - Product Requirements.

B. Fabricator: Certified by glass manufacturer for type of glass, coating, and treatment involved and capable of providing specified warranty.

C. Sealed Insulating Glass Units: Types as indicated.
   1. Locations: Exterior, except as otherwise indicated.
   2. Durability: Certified by an independent testing agency to comply with ASTM E2190.
   3. 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.
   4. Warm-Edge Spacers: Viracon Thermal Spacer (VTS).
      a. Products:
         1) Viracon, Apogee Enterprises, Inc: www.viracon.com.
         2) Technoform Glass Insulation; TGI-Spacer: www.glassinsulation.us.
         3) Substitutions: See Section 01 6000 - Product Requirements.
   5. Spacer Color: Black.
   6. Edge Seal:
      a. Dual-Sealed System: Provide polyisobutylene sealant as primary seal applied between spacer and glass panes, and silicone sealant as secondary seal applied around perimeter.
   7. Color: Black.
   8. Purge interpane space with dry air, hermetically sealed.
   9. 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 between point of fabrication and point of installation to permit pressure equalization of air space.
      a. Capillary Tubes: Tubes to remain open and be of length and material type in accordance with insulating glass fabricator's requirements.

2.05 GLAZING TYPES - SEALED INSULATING UNITS

A. Type G1 - Sealed Insulating Glass Units: Vision glazing, low-E.
   1. Between-lite space filled with air.
   2. Winter Thermal Resistance (U-Value): 0.28.
   3. Total Solar Heat Gain Coefficient: 0.27.
   4. Total Visible Light Transmittance: 64 percent.
   5. Outdoor Visible Light Reflectance: 12 percent.
   6. Basis of Design: Vitro Architectural Glass: www.vitrowindowglass.com.
   7. Outboard Lite: Starphire Ultra-Clear, low-iron heat-strengthened float glass, 1/4 inch (6 mm) thick.
      a. Coating: Vitro Solarban 70 on #2 surface.
   8. Inboard Lite: Annealed float glass, 1/4 inch (6 mm) thick.
      a. Tint: Clear.
   9. Total Thickness: 1 inch (25 mm).

B. Type G2 - Sealed Insulating Glass Units: Vision glazing, low-E.
   1. Between-lite space filled with air.
   2. Winter Thermal Resistance (U-Value): 0.28.
   3. Total Solar Heat Gain Coefficient: 0.27.
   4. Total Visible Light Transmittance: 64 percent.
   5. Outdoor Visible Light Reflectance: 12 percent.
   6. Basis of Design: Vitro Architectural Glass: www.vitrowindowglass.com.
   7. Outboard Lite: Starphire Ultra-Clear, low-iron heat-strengthened float glass, 1/4 inch (6 mm) thick.
      a. Coating: Vitro Solarban 70 on #2 surface.
   8. Inboard Lite: Laminated heat-strengthened float glass, two 1/8 inch (3 mm) thick with inner layer.
      a. Tint: Clear.
      b. Inner layer: 60mil SG5000 by SentryGlas.
   9. Total Thickness: 1 1/16 inch.

C. Type G3 - Sealed Insulating Glass Units: Vision glazing, low-E.
   1. Between-lite space filled with air.
   2. Winter Thermal Resistance (U-Value): 0.29.
   3. Total Solar Heat Gain Coefficient: 0.22.
   4. Total Visible Light Transmittance: 25 percent.
   5. Outdoor Visible Light Reflectance: 8 percent.
   6. Basis of Design: Vitro Architectural Glass: www.vitrowindowglass.com.
   7. Outboard Lite: Solargray, Heat-strengthened float glass, 1/4 inch (6mm) thick.
      a. Coating: Vitro Solarban 90 on #2 surface.
   8. Inboard Lite: Annealed float glass, 1/4 inch (6 mm) thick.
      a. Tint: Clear.
   9. Total Thickness: 1 inch (25 mm).

D. Type G4 - Sealed Insulating Glass Units: Vision glazing, low-E.
   1. Between-lite space filled with air.
   2. Winter Thermal Resistance (U-Value): 0.29.
   3. Total Solar Heat Gain Coefficient: 0.22.
   4. Total Visible Light Transmittance: 25 percent.
   5. Outdoor Visible Light Reflectance: 8 percent.
   6. Basis of Design: Vitro Architectural Glass: www.vitrowindowglass.com.
   7. Outboard Lite: Solargray, Heat-strengthened float glass, 1/4 inch (6mm) thick.
      a. Coating: Vitro Solarban 90 on #2 surface.

8. Inboard Lite: Laminated heat-strengthened float glass, two 1/8 inch (3 mm) thick with inner layer.
    a. Tint: Clear.
    b. Inner Layer Basis of Design: 60mil SG5000 by SentryGlas.
9. Total Thickness: 1 1/16 inch.

E. Type G7 - Sealed Insulating Glass Units: Silicone-Coated Spandrel glazing (color #1).
1. Outboard Lite: Heat-strengthened float glass, 1/4 inch (6 mm) thick, minimum.
    a. Tint: Clear.
2. Inboard Lite: Annealed float glass, 1/4 inch (6 mm) thick.
    a. Tint: Clear.
    b. Coating: Water-based silicone spandrel glass coating on #4 surface.
        1) Color: As selected by Architect from manufacturer's full line.
        2) Basis of Design: OPACI-COAT-300 by ICD High Performance Coatings.
    c. Total Thickness: 1 inch (25 mm).

F. Type G8 - Sealed Insulating Glass Units: Silicone-Coated Spandrel glazing (color #2).
1. Outboard Lite: Heat-strengthened float glass, 1/4 inch (6 mm) thick, minimum.
    a. Tint: Clear.
2. Inboard Lite: Annealed float glass, 1/4 inch (6 mm) thick.
    a. Tint: Clear.
    b. Coating: Water-based silicone spandrel glass coating on #4 surface.
        1) Color: As selected by Architect from manufacturer's full line.
        2) Basis of Design: OPACI-COAT-300 by ICD High Performance Coatings.
    c. Total Thickness: 1 inch (25 mm).

G. Type G15 - Sealed Insulating Glass Units: Vision glazing.
1. Between-lite space filled with air.
2. Basis of Design: Vitro Architectural Glass: www.vitrowindowglass.com.
3. Outboard Lite: Starphire Ultra-Clear, low-iron heat-strengthened float glass, 1/4 inch (6 mm) thick.
4. Inboard Lite: Laminated heat-strengthened float glass, two 1/8 inch (3 mm) thick with inner layer.
    a. Tint: Clear.
    b. Inner layer: PVB.
5. Total Thickness: 1 1/16 inch.

H. Safety Glazing:
1. Applications: Provide this type of glazing in the following locations:
    a. Glazed lites in doors, except fire doors.
    b. Glazed sidelights to doors, except in fire-rated walls and partitions.
    c. Glazed view windows and panels in partitions enclosing athletic activity rooms, except in fire-rated walls and partitions.
    d. Other locations required by applicable federal, state, and local codes and regulations.
    e. Other locations indicated on the drawings noted with 'T'.

2.06 GLAZING TYPES - SINGLE VISION GLAZING

A. Type G5 - Single Vision Glazing:
1. Type: Annealed float glass.
2. Tint: Clear.
3. Thickness: 1/4 inch (6 mm).

B. Type G6 - Single Vision Glazing:
1. Type: Laminated heat-strengthened float glass.
2. Tint: Clear.
3. Thickness: Two 1/8 inch (3 mm) with inner layer.

4. Inner layer: 60mil SG5000 by SentryGlas.

C. Type G9 - Single Vision Glazing:
1. Type: Annealed float glass.
2. Tint: Clear.
3. Thickness: 1/2 inch (6 mm).
4. Edge Finish: Flat polished edges.

D. Type G10 - Single Vision Glazing:
1. Type: Laminated heat-strengthened float glass.
2. Tint: Clear.
3. Thickness: Two 5/16 inch (8 mm) with inner layer.
a. Inner layer: 60mil SG5000 by SentryGlas.

E. Type G14 - Single Spandrel Glazing:
1. Type: Annealed float glass, 1/4 inch (6 mm) thick.
a. Tint: Clear.
b. Coating: Water-based silicone spandrel glass coating on #2 surface.
1) Color: As selected by Architect from manufacturer's full line.
2) Basis of Design: OPACI-COAT-300 by ICD Performance Coatings.

F. Safety Glazing:
1. Applications: Provide this type of glazing in the following locations:
a. Glazed lites in doors, except fire doors.
b. Glazed sidelights to doors, except in fire-rated walls and partitions.
c. Glazed view windows and panels in partitions enclosing athletic activity rooms, except in fire-rated walls and partitions.
d. Other locations required by applicable federal, state, and local codes and regulations.
e. Other locations indicated on the drawings noted with 'T'.

2.07 GLAZING TYPES - FIRE RATED GLAZING

A. Type G11 - Fire Protective Rated Glass 100 sq in or less.
1. Thickness: 3/16 inch.
2. Rating: 90 minute.
3. IBC Fire Rated Marking: D-H-90.
4. Safety Glazing Certification: 16 CFR 1201 Category II.
5. Provide permanent markings on fire-protectve-rated glazing in compliance with ICC (IBC), local building code, and authorities having jurisdiction.
6. Basis of Design: Keralite by Vetrotech.
7. Substitutions: Refer to Section 01 6000 - Product Requirements.

B. Type G12 - Fire Protective Rated Glass.
1. Thickness: 1 1/2 inch.
2. Rating: 120 minute.
3. IBC Fire Rated Marking: W-120.
4. Safety Glazing Certification: 16 CFR 1201 Category II.
5. Provide permanent markings on fire-protectve-rated glazing in compliance with ICC (IBC), local building code, and authorities having jurisdiction.
6. Basis of Design: Superlite-II-XL by SAFTIFIRST.
7. Substitutions: Refer to Section 01 6000 - Product Requirements.

C. Type G13 - Fire Protective Rated Glass.
1. Thickness: 3/16 inch.
2. Rating: 45 minute.
3. IBC Fire Rated Marking: D-H-45.
4. Safety Glazing Certification: 16 CFR 1201 Category II.

5. Provide permanent markings on fire-protectve-rated glazing in compliance with ICC (IBC), local building code, and authorities having jurisdiction.
6. Basis of Design: Keralite by Vetrotech.
7. Substitutions: Refer to Section 01 6000 - Product Requirements.

D. Type G16 - Fire Protective Rated Glass.
1. Thickness: 1 1/2 inch.
2. Rating: 90 minute.
3. IBC Fire Rated Marking: D-H-W-90.
4. Safety Glazing Certification: 16 CFR 1201 Category II.

E. 5Provide permanent markings on fire-protectve-rated glazing in compliance with ICC (IBC), local building code, and authorities having jurisdiction.
1. Basis of Design: Superlite-II-XL by SAFTIFIRST.
2. Substitutions: Refer to Section 01 6000 - Product Requirements.

2.08 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, non-skinning.

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 as selected by architect.

C. Manufacturers:
1. Bostik Inc: www.bostik-us.com.
2. Dow Corning Corporation: www.dowcorning.com/construction.
3. Momentive Performance Materials, Inc, exclusive licensee of General Electric: www.siliconefor building.com.
4. Pecora Corporation: www.pecora.com.
5. Substitutions: See Section 01 6000 - Product Requirements.

2.09 GLAZING ACCESSORIES

A. Setting Blocks: Silicone, with 80 to 90 Shore A durometer hardness; ASTM C864 Option II. Length of 0.1 inch for each square foot of glazing or minimum 4 inch by width of glazing rabbet space minus 1/16 inch by height to suit glazing method and pane weight and area.

B. Spacer Shims: Neoprene, 50 to 60 Shore A durometer hardness; ASTM C864 Option I. Minimum 3 inches long 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 compoundwith integral resilient spacer rod applicable to application indicated; 10 to 15 cured Shore A durometer hardness; coiled on release paper; black color.
1. Manufacturers:
a. Pecora Corporation: www.pecora.com.
b. Tremco Global Sealants: www.tremcosealants.com.
c. Saint-Gobain Performance Plastics: www.plastics.saint-gobain.com.
d. Substitutions: See Section 01 6000 - Product Requirements.

D. Glazing Gaskets: Resilient silicone extruded shape to suit glazing channel retaining slot; ASTM C864 Option I; color as selected by Architect.
1. Gaskets to be one piece with factory molded corners.

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. Proceed with glazing system installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Clean contact surfaces with appropriate solvent and wipe dry 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 sealants in accordance with ASTM C1193, GANA (SM) Sealant Manual, and manufacturer's instructions.

3.04 INSTALLATION - INTERIOR DRY GLAZING METHOD (TAPE AND TAPE)

A. Application - Interior Glazed: Set glazing infills from the interior of the building.
B. Cut glazing tape to length and set against permanent stops, projecting 1/16 inch above sight line.
C. Place setting blocks at 1/4 points with edge block no more than 6 inch from corners.
D. Rest glazing on setting blocks and push against tape for full contact at perimeter of pane or unit.
E. Place glazing tape on free perimeter of glazing in same manner described above.
F. Install removable stop without displacement of tape. Exert pressure on tape for full continuous contact.
G. Carefully trim protruding tape with knife.

3.05 INSTALLATION - EXTERIOR WET/DRY GLAZING METHOD (PREFORMED TAPE AND SEALANT)

A. Application - Exterior Glazed: Set glazing infills from the exterior of the building.
B. Cut glazing tape to length and set against permanent stops, 3/16 inch below sight line. Seal corners by butting tape and dabbing with butyl sealant.
C. Apply heel bead of butyl sealant along intersection of permanent stop with frame ensuring full perimeter seal between glass and frame to complete the continuity of the air and vapor seal.
D. Place setting blocks at 1/4 points with edge block no more than 6 inch from corners.
E. Rest glazing on setting blocks and push against tape and heel bead of sealant with sufficient pressure to attain full contact at perimeter of pane or glass unit.
F. Install removable stops, with spacer strips inserted between glazing and applied stops 1/8 inch below sight lines.
    1. Place glazing tape on glazing pane of unit with tape flush with sight line.
G. Fill gap between glazing and stop with sealant to depth equal to bite of frame on glazing, but not more than 3/8 inch below sight line.
H. Apply cap bead of sealant along void between the stop and the glazing, to uniform line, flush with sight line. Tool or wipe sealant surface smooth.

3.06 CLEANING

A. Remove excess glazing materials from finish surfaces immediately after application using solvents or cleaners recommended by manufacturers.
B. Remove nonpermanent labels immediately after glazing installation is complete.
C. Clean glass and adjacent surfaces after sealants are fully cured.
D. Clean glass on both exposed surfaces not more than 4 days prior to Date of Substantial Completion in accordance with glass manufacturer's written recommendations.

3.07 PROTECTION

A. After installation, mark pane with an 'X' by using removable plastic tape or paste; do not mark heat absorbing or reflective glass units.
B. Remove and replace glass that is damaged during construction period prior to Date of Substantial Completion.

END OF SECTION 08 8000

This page intentionally left blank

SECTION 08 8100

GLAZED WALL SYSTEM

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Furnish all labor, materials, equipment, tools and services required to fully complete all Glazed Wall System work as indicated on the drawings and/or specified herein including, but not limited to, the following described items.
B. Full height glass wall system and doors.
C. Full height glass display case system and doors.
D. Do not include sales tax, refer to Section 00 0104 - Notice to Contractors.

1.02 RELATED REQUIREMENTS

A. Section 07 9200 - Joint Sealants.
B. Section 08 8000 - Glazing: Glazing requirements.
C. Section 08 7100 - Door Hardware: Hardware items other than those specified in this section
D. Section 09 2116 - Gypsum Board Assemblies: Supporting and adjacent structure.

1.03 REFERENCE STANDARDS

A. ASTM A240/A240M - Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications; 2020a.
B. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2021.
C. ASTM C1036 - Standard Specification for Flat Glass; 2021.
D. ASTM C1048 - Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass; 2018.
E. ASTM C1115 - Standard Specification for Dense Elastomeric Silicone Rubber Gaskets and Accessories; 2017.
F. ASTM C864 - Standard Specification for Dense Elastomeric Compression Seal Gaskets, Setting Blocks, and Spacers; 2005 (Reapproved 2015).
G. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2018.
H. GANA (GM) - GANA Glazing Manual; 2008.
I. NAAMM AMP 500-06 - Metal Finishes Manual; 2006.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene at project site seven (7) calendar days prior to scheduled start of construction activities of this section and review section requirements.
    1. Attendance: Architect, Contractor, partition system installer, and related trades.
    2. Review and discuss:
        a. Critical dimensions.
        b. Product delivery and storage.
        c. Staging and sequencing.
        d. Protection of completed work.

1.05 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. Installation methods.

C. Shop Drawings: Include plans, elevations, and details showing type and thickness of glass, glazing, anchoring, trim, and accessories.

D. Samples:
1. Two samples, 6 inches (150 mm), showing actual material and finish of metal components.
2. Two samples, 12 inches (150 mm) square, showing actual material and finish of glass.

1.06 QUALITY ASSURANCE

A. Installer Qualifications:
1. Minimum 5 years documented experience in work of this Section.

B. Mockup:
1. Size: Minimum 6 feet long by full height.
2. Show: Framing system, glazing, trim, and accessories.
3. Locate where directed.
4. Approved mockup may remain as part of the Work.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to project site and store in protective cartons until openings are ready for installation.

B. Protect finished surfaces with wrapping paper or strippable coating during installation. Do not use adhesive papers or sprayed coatings that bond to substrate when exposed to sunlight or weather.

1.08 FIELD CONDITIONS

A. Do not install sealants and glazing materials when ambient temperature is less than 40 degrees F.

B. Maintain this minimum temperature during and 24 hours after installation.

1.09 GUARANTEE

A. The Contractor shall guarantee his work for a period of 1 years from date of Substantial Completion. Guarantee shall be on form included in Section 01 7800.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Components:
1. C.R. Laurence Co, Inc: www.crlaurence.com.
2. Substitutions: See Section 01 6000 - Product Requirements.

2.02 PERFORMANCE REQUIREMENTS

A. Regulatory Requirements:
1. Provide tempered or laminated safety glass for locations subject to human impact as required by applicable Building Code.

B. Design Requirements: Design glass partition system to withstand live loads in accordance with Building Code resulting in maximum L/120 deflection.

2.03 FULL HEIGHT SINGLE GLAZED WALL SYSTEM - 5/8-INCH GLASS

A. Full height, single butt glazed glass wall system.
1. Configuration: Straight wall sections, as indicated on Drawings.

2. Glazing: 5/8 inch clear tempered float glass with flat polished edges.
3. Head and Sill Frames:
    a. Head: Extruded Aluminum 2 1/8 inch by 1 5/8 inch (54mm x 41mm) with stainless steel cladding.
        1) Acceptable Product: NH3BSSL manufactured by CR Laurence.
    b. Sill: Extruded Aluminum 4 inches by 2-1/4 inches (100 mm by 58 mm) with stainless steel cladding.
        1) Acceptable Product: SR4SBS34 series manufactured by CR Laurence.
    c. Provide setting blocks and glazing gaskets as required.
    d. Provide end covers or channel end caps as required.
4. Glass Joints:
    a. Glass to Glass Vertical Joint: 3/8 inch (9.5 mm) open vertical joints.
    b. Glass to Wall Vertical Joint: 3/8 inch (9.5 mm) open vertical joints or Silicone glazed joint, where shown on Drawings.

B. Glazed Wall System Doors:
1. Configuration: Door sections, as indicated on Drawings.
2. Glazing: inch clear tempered float glass with flat polished edges.
3. Head and Sill Frames:
    a. Head: Extruded Aluminum 4 inches by 2-1/4 inches (100 mm x 58 mm) with stainless steel cladding.
        1) Acceptable Product: DR4SPS58 series manufactured by CR Laurence.
    b. Sill: Extruded Aluminum 4 inches by 2-1/4 inches (100 mm x 58 mm) with stainless steel cladding.
        1) Acceptable Product: DR4SPS58 series manufactured by CR Laurence.
    c. Provide setting blocks and glazing gaskets as required.
    d. Provide end covers or channel end caps as required.
    e. No cylinder prep.
4. Door Hardware: As provided by Section 08 7100 to be installed as part of this Section

2.04 MATERIALS

A. Aluminum Extrusions:
1. ASTM B221, 6063-T6 alloy and temper.
2. Finish: Satin anodized.

B. Stainless Steel Cladding
1. Stainless Steel: ASTM A240/A240M, Type 304
2. Stainless Steel Finish: NAAMM AMP 500-06 503; No. 6 Satin

C. Float Glass:
1. Annealed Type: ASTM C1036, Type I, transparent flat, Class 1 clear, Quality Q3 (glazing select), with flat polished edges.
2. Fully Tempered, where required: ASTM C1048
3. Thickness: 1/2 inch or 3/4 inch as described in systems above.

D. Glazing Gaskets:
1. ASTM C864 neoprene or EPDM, or ASTM C1115, silicone or thermoplastic polyolefin rubber, molded or extruded shape to fit glazing channel retaining slot.

E. Sealant: Water clear silicone sealant meeting ASTM C920
1. Acceptable Product: WCS1/WCS5 Water Clear Silicone Sealant manufactured by CR Laurence.

F. Concealed Fasteners and Anchors: Types best suited to application.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that openings are acceptable.
B. Do not begin installation until substrates and openings have been properly prepared.
C. If substrate preparation is the responsibility of another installer or trade, notify Architect of unsatisfactory or detrimental conditions before proceeding.

3.02 INSTALLATION

A. Install in accordance with approved shop drawings.
B. Install components plumb and level, in proper plane, free from warp and twist.
C. Tolerances:
    1. Horizontal Components and Sight Lines: Not more than 1/8 inch in 10 feet variation from level, non-cumulative.
    2. Vertical Components and Sight Lines: Not more than 1/8 inch in 10 feet variation from plumb, non-cumulative.
    3. Variation from Plane or Indicated Location: Not more than 1/16.
D. Install glass and accessories in accordance with GANA (GM)

3.03 CLEANING

A. After installation clean metal and glass surfaces to remove dust, loose fibers, fingerprints, adhesives, and other foreign materials.

3.04 PROTECTION

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

END OF SECTION 08 8100

SECTION 08 8200

DISPLAY CASE ASSEMBLIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Furnish all labor, materials, equipment, tools and services required to fully complete all Display Case Assembly work as indicated on the drawings and/or specified herein including, but not limited to, the following described items.
B. Built-in display case assemblies.
   1. Display case doors.
   2. Tackable display case lining.
   3. Display case shelving system.
C. Wall mounted display case.
D. Do not include sales tax, refer to Section 00 1115 - Advertisement for Prequalification of Bidders.

1.02 RELATED REQUIREMENTS

A. Section 04 2731 - Reinforced Unit Masonry: Supporting and adjacent structure.
B. Section 06 1000 - Rough Carpentry: Wood blocking, nailers, sheathing, and supports.
C. Section 06 2000 - Finish Carpentry: Wood veneer panels and hardwood trim.
D. Section 06 4100 - Architectural Casework: Custom casework requirements, supporting structure, and miscellaneous trim.
E. Section 09 2116 - Gypsum Board Assemblies: Supporting and adjacent structure.
F. Section 07 9200 - Joint Sealants.
G. Section 08 8000 - Glazing: Glazing requirements.

1.03 REFERENCE STANDARDS

A. 16 CFR 1201 - Safety Standard for Architectural Glazing Materials; Current Edition.
B. AAMA 611 - Voluntary Specification for Anodized Architectural Aluminum; 2020.
C. ANSI Z97.1 - American National Standard for Safety Glazing Materials Used in Buildings - Safety Performance Specifications and Methods of Test; 2015 (Reaffirmed 2020).
D. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2021.
E. ASTM C1048 - Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass; 2018.
F. GANA (GM) - GANA Glazing Manual; 2008.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordinate work of related trades, including Reinforced Unit Masonry, Rough Carpentry, Finish Carpentry, Architectural Casework, Gypsum Board Assemblies, and Glazing, to prepare openings and install built-in display case assemblies.

1.05 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. Manufacturer's standard details and fabrication method.
   2. Data on finishes, hardware, and accessories.
   3. Recommendations for maintenance and cleaning of finished surfaces.

4. Installation methods.

C. Shop drawings for each Display Case Assembly are required, including:
   1. Layout and installation details.
   2. Elevations at 1/4-inch scale.
   3. Anchorage and reinforcement.
   4. Glazing details.

D. Shop Drawings: Include plans, elevations, and details showing type and thickness of glass, glazing, anchoring, trim, and accessories.

E. Samples:
   1. Two samples each, 12 inches (300 mm) in length, showing actual material and finish of all metal components
   2. Two samples each, 12 inches (150 mm) square in size, showing actual material and finish of glass and tackboard system, including edge conditions.

1.06 QUALITY ASSURANCE

A. Installer Qualifications:
   1. Engage an experienced installer who has completed installations of Display Case Assemblies similar in design and extent to those required for the project and whose work has resulted in construction with a record of success in service performance and has a minimum of 5 years of documented experience.

B. Display Case Door System Manufacturer Qualifications: Provide Display Case Doors produced by a firm experienced in manufacturing Display Case Door Systems that are similar to those indicated for this project and that have a record of success in service performance.
   1. Single source responsibility: Obtain Display Case Door Systems from a single manufacturer to ensure full compatibility and warranty of parts.

C. Shelving System Manufacturer Qualifications: Manufacturer specializing in designing and fabricating aluminum display systems, support brackets, and other architectural specialties with 5 years minimum successful experience.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to project site and store in protective cartons until openings are ready for installation.

B. Protect finished surfaces with wrapping paper or strippable coating during installation. Do not use adhesive papers or sprayed coatings that bond to substrate when exposed to sunlight or weather.

1.08 FIELD CONDITIONS

A. Field Measurements: Check opening by accurate field measurement before fabrication.
   1. Show recorded measurements on shop drawings. Coordinate fabrication schedule with construction progress to avoid delay of the work and possible damage to the finished product.

1.09 GUARANTEE

A. The Contractor shall guarantee his work for a period of One (1) year from date of Substantial Completion. Guarantee shall be on form included in Section 01 7800.

PART 2 PRODUCTS

2.01 BUILT-IN DISPLAY CASE SHELVING SYSTEM

A. Basis of Design Manufacturer:
   1. Rangine Corporation: www.rakks.com.

a. Rakks Aluminum Shelving System.
1) Substitutions: See Section 01 6000 - Product Requirements.

B. Display Case Shelving System: Modular, adjustable display system consisting of compatible aluminum parts including wall mounted standards, pole supports, shelf support brackets, and accessories required for a complete, functional system.
1. Provide complete shelving system as detailed on Drawings consisting of modular components that can be field assembled using simple hand tools. System shall provide:
a. Fully compatible components allowing integration into total system.
1) Total shelf adjustability without slots or visible hardware.
2) Capability to expand.
3) Capability for disassembly, relocation, and reconfiguration.

C. Material: Fabricate components from extruded aluminum sections complying with ASTM B221, 6063-T5 alloy and temper.

D. Fasteners: Provide type and size as recommended by manufacturer for specific applications. Exposed to view fasteners shall have finish to match standards and other components.

E. Factory Applied Finish: Exposed aluminum surfaces shall be free of scratches and other serious blemishes and be factory finished with clear anodized coating complying with AAMA 607.1 - MM10C22A31.
1. Front edges of shelf brackets with a clear anodized finish shall be buffed.

F. Wall Standards: Channel type, extruded aluminum standard to be recessed mounted on walls and designed to hold shelf support brackets inserted into channel access slots and slid to desired position.
1. Basic Channel: 0.700 inch wide by 0.535 inch deep (18 mm wide by 14 mm deep) channel with projecting lips to retain shelf brackets; Model SC-Standard.
2. Access Slots: Provide standards with slots in channels for insertion and removal of shelf support brackets. Slots shall be sized for type of bracket used.
3. Channel Covers: Provide wall standards with PVC, snap-in channel covers with translucent finish; Model No. CC-096.

G. Shelf Support Brackets: Fabricated from aluminum and designed to slide into support channels, be positioned at any height, and securely locked into place.
1. Rectangular Bracket: Fabricated from 1/4 inch (4 mm) thick extruded aluminum bar with steel pin to retain and hold bracket in support channel; Rakks Style Bracket.
a. Depth: 2 inches
b. Length: As shown on Drawings or as required.

H. Glass Shelves: Provide flat, fully tempered glass.
1. Safety Glass Standards: Tempered glass components that comply with ANSI Z97.1 and testing requirements of CPSC 16 CFR 1201 Category II. Comply with ASTM C1048, Kind FT (fully tempered), Condition A (uncoated), Type I (transparent, flat), Class 1 (clear), Quality q3 glazing.
2. Thicknesses: 3/8 inch (10 mm); where shown on drawings.
3. Edge treatment: Provide flat polished edges for all edges of glass.
4. Tint: Clear

I. Tackable Display Case Lining
1. Panels:
a. Core Material: 1/2 inch (12.7 mm) Class "A" rated tackable fiberboard.
b. Facing Material: Type II, Class "A" vinyl, 21 oz/linear yd, with Osnaburg backing and Teflon coating.
1) Pattern: Merrifield V200 by Koroseal/RJF International.
2) Color: As selected by Architect.
c. Size: As detailed on Drawings.
d. Profile: Square.

e. Intermediate Joints: Butt joints square.
f. Perimeter Trim: 5/8 inch (16 mm) aluminum "J" Trim.

J. A. Butt glazed glass display case doors.
1. Configuration: Straight door sections, as indicated on Drawings.
2. Glass: Provide flat, fully tempered glass.
a. Safety Glass Standards: Tempered glass components that comply with ANSI Z97.1 and testing requirements of CPSC 16 CFR 1201 Category II. Comply with ASTM C1048, Kind FT (fully tempered), Condition A (uncoated), Type I (transparent, flat), Class 1 (clear), Quality q3 glazing.
b. Thickness: 1/2 inch.
c. Edge treatment: Provide flat polished edges for all edges of glass.
d. Tint: Clear.
3. Head and Sill Channels:
a. Head: Stainless Steel 1 7/16 inch by 1 inch.
1) Acceptable Product: SP35BS12C manufactured by CR Laurence.
2) Provide end covers or channel end caps as required.
4. Sill: Stainless Steel 1 7/16 inch by 1 inch.
1) Acceptable Product: SP35BS12CR (Right Hand) SP35BS12CL (Left Hand) manufactured by CR Laurence.
2) Include lock at each door.
3) Provide end covers or channel end caps as required.
b. Provide setting blocks and glazing gaskets as required.
c. Provide end covers or channel end caps as required.
5. Glass Joints:
a. Glass to Glass Vertical Joint: 3/8 inch maximum open vertical joints.
b. Glass to Wall Vertical Joint: 3/8 inch maximum open vertical joints.

2.02 WALL MOUNTED DISPLAY CASE

A. Basis of Design Manufacturer:
1. Onnit Systems: www.onnitsystems.com.
a. Product: Display Case - 12D.
2. Substitutions: See Section 01 6000 - Product Requirements.

B. Wall Mounted Display Cases: 3 sided aluminum and steel framed case with 3 suspended glass shelves, rear tackable surface, sliding glass doors with lock, light fixtures and aluminum trim.
1. Sizes: As detailed on Drawings.
2. Aluminum Tubing: 2 inch by 6 inch (51 mm by 152 mm).
3. Steel Framing: 5 inch (127 mm) steel "C" channel.
4. Top: 3/4 inch (19 mm) plywood with aluminum break metal.
5. Floor: Wood veneer.
6. Shelving Support: Brushed aluminum wire and bracket system with 1/8 inch (3 mm) stainless steel cables.
7. Shelves: 1/2 inch (13 mm) thick tempered glass with all edges polished.
8. Doors 1/4 inch and Panel Ends 3/8 inch: thick tempered glass with all edges polished.
a. Routed finger pulls on doors.
9. Tackable Panels: 1/2 inch (13 mm) Class "A" rated tackable fiberboard with Type II, Class "A" vinyl, 21 oz/linear yd, with osnaburg backing and teflon coating.
10. Lighting: 277 v LED 4000k with CRI 80+
11. Finishes:
a. Aluminum: Brushed aluminum.
b. Vinyl: Pattern and Color as selected by Architect from manufacturer's full range

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that openings are acceptable.
B. Do not begin installation until substrates and openings have been properly prepared.
C. If substrate preparation is the responsibility of another installer or trade, notify Architect of unsatisfactory or detrimental conditions before proceeding.

3.02 INSTALLATION

A. Install in accordance with manufacturer's printed instructions and approved shop drawings.
B. Install components plumb and level, in proper plane, free from warp and twist.
C. Install glass and accessories in accordance with GANA (GM) Glazing Manual.

3.03 ADJUSTING

A. Adjust doors and hardware to provide an acceptable fit at meeting points and at weatherstripping for smooth operation and dust tight closure.
B. Hardware: Adjust operating hardware to ensure proper operation.

3.04 CLEANING

A. After installation clean metal and glass surfaces to remove dust, loose fibers, fingerprints, adhesives, and other foreign materials.

3.05 PROTECTION

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

END OF SECTION 08 8200

This page intentionally left blank

SECTION 08 8300

ACTIVITY MIRRORS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Furnish all labor, materials, equipment, tools and services required to fully complete all Mirror work as is indicated on the drawings and/or specified herein including, but not limited to, the following described items.
B. Activity Mirrors
   1. Locations:
      a. Dance Studio.
C. Do not include sales tax, refer to Section 00 1115 - Advertisement for Prequalification of Bidders.

1.02 RELATED REQUIREMENTS

A. Section 08 8000 - Glazing.
B. Section 09 2116 - Gypsum Board Assemblies.
C. Section 10 2800 - Toilet, Bath & Utility Accessories: Metal framed mirrors.
D. Division 26 - Electrical: Devices to be cut out of mirrors.

1.03 REFERENCE STANDARDS

A. ASTM C1036 - Standard Specification for Flat Glass; 2021.
B. GANA (GM) - GANA Glazing Manual; 2008.
C. GANA (SM) - GANA Sealant Manual; 2008.
D. GANA (TIPS) - Mirrors: Handle with Extreme Care (Tips for the Professional on the Care and Handling of Mirrors); 2011.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Product Data on Mirror Types: Submit structural, physical and environmental characteristics, size limitations, special handling and installation requirements.
C. Product Data on Glazing Compounds: Submit chemical, functional, and environmental characteristics, limitations, special application requirements, and identify available colors.
D. Samples: Submit two samples, 12 inches by 12 inches in size, illustrating mirrors design, edging, and coloration.
E. Manufacturer's Certificate: Certify that mirrors, meets or exceeds specified requirements.
F. Warranty: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

1.05 QUALITY ASSURANCE

A. Perform Work in accordance with GANA (GM) and GANA (SM) for glazing installation methods.
   1. Maintain one copy on project site.
B. Fabricate, store, transport, receive, install, and clean mirrors in accordance with recommendations of GANA (TIPS).

1.06 FIELD CONDITIONS

A. Do not install mirrors when ambient temperature is less than 50 degrees F.

B. Maintain minimum ambient temperature before, during and 24 hours after installation of glazing compounds.

1.07 WARRANTY

A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
B. Provide One (1) year manufacturer warranty for reflective coating on mirrors and replacement of same.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Activity Mirrors
   1. C.R. Laurence Company: www.crlaurence.com.
   2. Binswanger Mirror/ACI Distribution: www.binswangerglass.com.
   3. Lenoir Mirror Co: www.lenoirmirror.com.
   4. Trulite Glass and Aluminum Solutions: www.trulite.com.
   5. Substitutions: See Section 01 6000 - Product Requirements.

2.02 MATERIALS

A. Mirror Design Criteria: Select materials and/or provide supports as required to limit mirror material deflection to 1/200, or to the flexure limit of glass, with full recovery of glazing materials, whichever is less.
B. Activity/Dance Mirror: Located where indicated on Drawings.
   1. Mirror Glass: Clear tempered safety type with copper and silver coating, organic overcoating, 1/4 inch (6 mm) thick minimum.
   2. Size: As shown on Drawings.
   3. Edges: Polished.
   4. Mounting Tape: Flexible closed cell polyethylene foam core double-coated with a high-tack acrylic-based pressure sensitive adhesive.
      a. Acceptable Product: CRL211612 manufactured by C.R. Laurence Co., Inc.
   5. Mirror Adhesive: Chemically compatible with mirror coating and wall substrate.
      a. Acceptable Product: CRL Palmer Mirro-Mastic manufactured by C.R. Laurence Co., Inc.
   6. Bottom Edge Support: Satin Anodized Aluminum 1/4 inch (6 mm) standard "J" Channel.
      a. Acceptable Product: D636A manufactured by C.R. Laurence Co., Inc.

2.03 ACCESSORIES

A. Setting Blocks: Neoprene, 80 to 90 Shore A durometer hardness.
B. Spacer Shims: Neoprene, 50 to 60 Shore A durometer hardness.
C. Glazing Tape: Preformed butyl compound; 10 to 15 Shore A durometer hardness; on release paper.
D. Glazing Clips: Manufacturer's standard type.
E. Mirror Attachment Accessories: Stainless steel clips.
F. Mirror Adhesive: Silicone pre-polymer based, chemically compatible with mirror coating and wall substrate.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that surfaces of mirror frames or recesses are clean, free of obstructions, and ready for installation of mirrors.

3.02 PREPARATION

A. Clean contact surfaces with solvent and wipe dry.

3.03 INSTALLATION

A. Install mirrors in accordance with GANA (TIPS) and manufacturers recommendations.
B. Set mirrors plumb and level, and free of optical distortion.
C. Set mirrors with edge clearance free of surrounding construction including countertops or backsplashes.
D. Activity/Dance Mirror Installation:
    1. Install bottom edge support rigidly to wall. Set mirrors with adhesive and mounting tape, applied in accordance with manufacturer's instructions.

3.04 CLEANING

A. Remove labels after work is complete.
B. Clean mirrors and adjacent surfaces.

END OF SECTION 08 8300

This page intentionally left blank

SECTION 09 0561

COMMON WORK RESULTS FOR FLOORING PREPARATION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. This section applies to all floors identified in the contract documents as to receive the following types of floor coverings:
   1. Broadloom carpet.
   2. Carpet tile.
   3. Entrance flooring.
   4. Ceramic tile.
   5. Vinyl Composite Tile (VCT).
B. Preparation of new concrete floor slabs for installation of floor coverings.
C. Testing of concrete floor slabs for moisture and pH.
D. Do not include sales tax, refer to Section 00 0102 - Notice to Contractors.

1.02 RELATED REQUIREMENTS

A. Section 01 4000 - Quality Requirements: Additional requirements relating to testing agencies and testing.
B. Section 03 3000 - Cast-In-Place Concrete: Limitations on curing requirements for new concrete floor slabs.

1.03 ADMINISTRATIVE REQUIREMENTS

A. Coordinate scheduling of cleaning and testing, so that preliminary cleaning has been completed for at least 24 hours prior to testing.

1.04 SUBMITTALS

A. Floor Covering and Adhesive Manufacturers' Product Literature: For each specific combination of substrate, floor covering, and adhesive to be used; showing:
   1. Moisture and pH limits and test methods.
   2. Manufacturer's required bond/compatibility test procedure.
B. Testing Agency's Report: Include:
   1. Description of areas tested; include floor plans and photographs if helpful.
   2. Summary of conditions encountered.
   3. Moisture and pH test reports.
   4. Copies of specified test methods.
   5. Recommendations for remediation of unsatisfactory surfaces.
   6. Include certification of accuracy by authorized official of testing agency.
   7. Submit report to Architect.
   8. Submit report not more than two business days after conclusion of testing.
C. Adhesive Bond and Compatibility Test Report.

1.05 QUALITY ASSURANCE

A. Moisture and pH testing will be performed by an independent testing agency employed and paid by Owner.
   1. Contractor shall schedule testing.
B. Contractor's Responsibility Relating to Independent Agency Testing:
   1. Provide access for and cooperate with testing agency.

2. Confirm date of start of testing at least 10 days prior to actual start.
3. Allow at least 4 business days on site for testing agency activities.
4. Achieve and maintain specified ambient conditions.
5. Notify Architect when specified ambient conditions have been achieved and when testing will start.

1.06 FIELD CONDITIONS

A. Maintain ambient temperature in spaces where concrete testing is being performed, and for at least 48 hours prior to testing, at not less than 65 degrees F (18 degrees C) or more than 85 degrees F (30 degrees C).
B. Maintain relative humidity in spaces where concrete testing is being performed, and for at least 48 hours prior to testing, at not less than 40 percent and not more than 60 percent.

1.07 GUARANTEE

A. The Contractor shall guarantee his work for a period of 1 year from date of Substantial Completion. Guarantee shall be on form included in Section 01 7800.

PART 2 PRODUCTS

2.01 MATERIALS

A. Patching Compound: Floor covering manufacturer's recommended product, suitable for conditions, and compatible with adhesive and floor covering. In the absence of any recommendation from flooring manufacturer, provide a product with the following characteristics:
   1. Cementitious moisture-, mildew-, and alkali-resistant compound, compatible with floor, floor covering, and floor covering adhesive, and capable of being feathered to nothing at edges.
   2. Latex or polyvinyl acetate additions are permitted; gypsum content is prohibited.
   3. Compressive Strength: 3000 psi, minimum, after 28 days, when tested in accordance with ASTM C109/C109M or ASTM C472, whichever is appropriate.

PART 3 EXECUTION

3.01 CONCRETE SLAB PREPARATION

A. Follow recommendations of testing agency.
B. Perform following operations in the order indicated:
   1. Preliminary cleaning.
   2. Moisture vapor emission tests; 3 tests in the first 1000 square feet (100 square meters) and one test in each additional 1000 square feet (100 square meters), unless otherwise indicated or required by flooring manufacturer.
   3. Internal relative humidity tests; in same locations as moisture vapor emission tests, unless otherwise indicated.
   4. pH tests; in same locations as moisture vapor emission tests, unless otherwise indicated.
   5. Specified remediation, if required.
   6. Patching, smoothing, and leveling, as required.
   7. Other preparation specified.
   8. Adhesive bond and compatibility test.
   9. Protection.
C. Remediations:
   1. Active Water Leaks or Continuing Moisture Migration to Surface of Slab: Correct this condition before doing any other remediation; re-test after correction.

2. Excessive Moisture Emission or Relative Humidity: Contact architect in writing and use alternate flooring adhesive.
3. Excessive pH: Contact architect in writing and use adhesive that is resistant to the level present and acceptable to the flooring manufacturer; otherwise, apply a skim coat of specified patching compound over entire suspect floor area.

3.02 PRELIMINARY CLEANING

A. Clean floors of dust, solvents, paint, wax, oil, grease, asphalt, residual adhesive, adhesive removers, film-forming curing compounds, sealing compounds, alkaline salts, excessive laitance, mold, mildew, and other materials that might prevent adhesive bond.
B. Do not use solvents or other chemicals for cleaning.

3.03 MOISTURE VAPOR EMISSION TESTING

A. Where the floor covering manufacturer's requirements conflict with either the referenced test method or this specification, comply with the manufacturer's requirements.
B. Where this specification conflicts with the referenced test method, comply with the requirements of this section.
C. Test in accordance with ASTM F1869 and as follows.
D. Plastic sheet test and mat bond test may not be substituted for the specified ASTM test method, as those methods do not quantify the moisture content sufficiently.
E. In the event that test values exceed floor covering manufacturer's limits, perform remediation as indicated. In the absence of manufacturer limits, perform remediation if test values exceed 3 pounds per 1000 square feet (1.4 kg per 93 square meters) per 24 hours.
F. Report: Report the information required by the test method.

3.04 PH TESTING

A. Where the floor covering manufacturer's requirements conflict with either the referenced test method or this specification, comply with the manufacturer's requirements.
B. Note: This procedure is the equivalent of that described in ASTM F710, repeated here for the Contractor's convenience.
C. Use a wide range pH paper, its associated chart, and distilled or deionized water.
D. Place several drops of water on a clean surface of concrete, forming a puddle approximately 1 inch (25 mm) in diameter. Allow the puddle to set for approximately 60 seconds, then dip the pH paper into the water, remove it, and compare immediately to chart to determine pH reading.
E. In the event that test values exceed floor covering manufacturer's limits, perform remediation as indicated. In the absence of manufacturer limits, perform remediation if any test value is over 10.

3.05 PREPARATION

A. See individual floor covering section(s) for additional requirements.
B. Comply with requirements and recommendations of floor covering manufacturer.
C. Fill and smooth surface cracks, grooves, depressions, control joints and other non-moving joints, and other irregularities with patching compound.
D. Do not fill expansion joints, isolation joints, or other moving joints.

3.06 ADHESIVE BOND AND COMPATIBILITY TESTING

A. Comply with requirements and recommendations of floor covering manufacturer.

3.07 APPLICATION OF REMEDIAL FLOOR COATING

A. Comply with requirements and recommendations of coating manufacturer.

3.08 PROTECTION

A. Cover prepared floors with building paper or other durable covering.

END OF SECTION 09 0561

SECTION 09 2116

GYPSUM BOARD ASSEMBLIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Furnish all labor, materials, equipment, tools and services required to fully complete all Gypsum Board Assembly work as is indicated on the drawings and/or specified herein including, but not limited to, the following described items.
B. Performance criteria for gypsum board assemblies.
C. Metal stud wall framing.
D. Tile backing board.
E. Gypsum shaft liner.
F. Acoustic sealant.
G. Joint treatment and accessories.
H. Metal channel ceiling framing (as noted as C18 in the drawings)
    1. Acoustic Type Resilient / Spring isolated assembly.
        a. Delegated design and construction.
        b. Location: Dance D101.
I. Do not include sales tax, refer to Section 00 1115 - Advertisement for Prequalification of Bidders.

1.02 RELATED REQUIREMENTS

A. Section 05 4000 - Cold-Formed Metal Framing: Exterior wind-load-bearing metal stud framing.
B. Section 06 1000 - Rough Carpentry: Miscellaneous wood blocking products.
C. Section 07 2100 - Building Insulation: Acoustic insulation.
D. Section 07 2500 - Membrane 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.
G. Section 09 2220 - Gypsum Board Metal Suspension Systems
H. Section 09 3000 - Tiling: Tile backing board.
I. Section 10 2800 Toilet Accessories: Areas needing blocking.

1.03 REFERENCE STANDARDS

A. AISI S100-12 - North American Specification for the Design of Cold-Formed Steel Structural Members; 2012.
B. ANSI A118.9 - American National Standard Specifications for Test Methods and Specifications for Cementitious Backer Units; 2019.
C. ANSI A118.9>ANSI A108/A118/A136.1 - American National Standard Specifications for Test Methods and Specifications for Cementitious Backer Units; 1999 (Reaffirmed 2010).
D. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2020.
E. ASTM C475/C475M - Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board; 2017.
F. ASTM C645 - Standard Specification for Nonstructural Steel Framing Members; 2018.
G. ASTM C754 - Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products; 2020.
H. ASTM C840 - Standard Specification for Application and Finishing of Gypsum Board; 2020.

I. ASTM C954 - Standard Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs From 0.033 in. (0.84 mm) to 0.112 in. (2.84 mm) in Thickness; 2018.
J. 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; 2020.
K. ASTM C1047 - Standard Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base; 2019.
L. ASTM C1177/C1177M - Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing; 2017.
M. ASTM C1178/C1178M - Standard Specification for Coated Glass Mat Water-Resistant Gypsum Backing Panel; 2018.
N. ASTM C1325 - Standard Specification for Fiber-Mat Reinforced Cementitious Backer Units; 2021.
O. ASTM C1396/C1396M - Standard Specification for Gypsum Board; 2017.
P. ASTM D3273 - Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber; 2021.
Q. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements; 2009 (Reapproved 2016).
R. ASTM E413 - Classification for Rating Sound Insulation; 2016.
S. GA-214 - Levels of Finish for Gypsum Panel Products; 2021.
T. GA-216 - Application and Finishing of Gypsum Panel Products; 2016, with Errata.
U. GA-236 - Joint Treatment Under Extreme Weather Condition; 2013.
V. UL U419 - Fire Resistance Ratings; 2016.
W. UL V438 - Fire Resistance Ratings; 2014.
X. UL V450 - Fire Rated System Design; 2016.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Shop Drawings: Indicate special details associated with fireproofing and acoustic seals.
C. Product Data: Provide data on metal framing, gypsum board, glass mat faced gypsum board, accessories, and joint finishing system.
D. Product Data: Provide manufacturer's data on partition head to structure connectors, showing compliance with requirements.

1.05 QUALITY ASSURANCE

A. Installer Qualifications: Company specializing in performing gypsum board installation and finishing, with minimum 3 years of experience.
B. Copies of Documents at Site: Maintain at the project site a copy of each referenced document that prescribes execution requirements.

1.06 MOCK-UP

A. Mockups: Before beginning gypsum board installation, install mockups of at least 100 sq. ft. (9 sq. m) in surface area to demonstrate aesthetic effects and set quality standards for materials and execution.
    1. Install Mockups for the following:
        a. Each level of gypsum board finish indicated for the use in exposed locations.
        b. Each texture finish indicated.
    2. Apply or install final decoration indicated, including painting and wallcoverings, on exposed surfaces for review of mockups

1.07 GUARANTEE

A. The Contractor shall guarantee his work for a period of One (1) year from date of Substantial Completion. Guarantee shall be on form included in Section 01 7800.

PART 2 PRODUCTS

2.01 GYPSUM BOARD ASSEMBLIES

A. See part 3 for finishing requirements.
B. Acoustic Interior Partitions: Provide completed assemblies with the following characteristics:
   1. All interior walls with insulation are to be treated as an Acoustic Assembly.
   2. Acoustic Attenuation: STC of 45-49 calculated in accordance with ASTM E413, based on tests conducted in accordance with ASTM E90.
C. Fire Rated Assemblies: Provide completed assemblies complying with applicable code.
   1. ICC IBC Item Numbers: Comply with applciable requirements of ICC IBC for the particular assembly.
   2. UL Assembly Numbers: Provide construction equivalent to that listed for the particular assembly in the current UL (FRD).
D. Manufacturers - Metal Framing, Connectors, and Accessories:
   1. Clarkwestern Dietrich Building Systems LLC: www.clarkdietrich.com.
   2. Marino: www.marinoware.com.
   3. Phillips Manufacturing Co: www.phillipsmfg.com.
   4. SCAFCO Corporation: www.scafco.com.
   5. Cemco Steel: www.cemcosteel.com.
   6. CertainTeed Corporation: www.certainteed.com.
   7. Any of the Board Manufacturers listed below.
   8. Substitutions: See Section 01 6000 - Product Requirements.
E. Loadbearing Studs for Application of Gypsum Board: As specified in Section 05 4000.
F. Non-Loadbearing Framing System Components: ASTM C645; galvanized sheet steel, of size and properties necessary to comply with ASTM C754 for the spacing indicated, with maximum
   1. Galvanize metal studs per ASTM C645.
      a. G60 Exterior Walls.
      b. G60 Interior Wet Areas - restrooms, showers, and kitchens.
      c. G40 Interior Dry Areas.
      d. A40 galvannealed products are unacceptable per ASTM C645.
   2. Studs: 33 mil minimum (unless noted otherwise on drawings), "C" shaped with flat or formed webs.
   3. Runners: 33 mil (unless noted otherwise on drawings), U shaped, sized to match studs.
   4. Slotted Deflection Track:
      a. Manufacturer’s deep-leg, U-shaped steel track; punched with vertical slots in both legs.
      b. Flange width (leg depth) and thickness as noted on Contract Drawings.
   5. Ceiling Channels: C-shaped.
   6. Furring: Hat-shaped sections, minimum depth of 7/8 inch, Refer to drawings for thickness
   7. Channel Bridging and Bracing: U-Channel Assembly; base metal thickness of 0.0538 inch (1.37 mm) and minimum 1/2 inch (12.7 mm) wide flanges.
   8. Flat Strap and Backing Plate: Sheet for blocking and bracing in length and width indicated:
      a. Galvanized sheet steel: 6 inches by continous by 18 ga minimum.
   9. Galvanized termination angle
      a. 2 inch by 2 inch angle to close gap between wall and floor.
   10. Deflection and Firestop Track:

a. Provide mechanical anchorage devices as described deflection while maintaining the fire-rating of the wall assembly.

G. Partition Head to Structure Connections: Provide mechanical anchorage devices that accommodate deflection using slotted holes, screws and anti-friction bushings, preventing rotation of studs while maintaining structural performance of partition.
   1. Structural Performance: Maintain lateral load resistance and vertical movement capacity required by applicable code, when evaluated in accordance with AISI S100-12.
      a. Products:
   2. Material: ASTM A653/A653M steel sheet, SS Grade 50/340, with hot-dipped galvanized coating to match wall stud coating.
   3. Provide components UL-listed for use in UL-listed fire-rated head of partition joint systems indicated on drawings.
   4. Provide mechanical anchorage devices as described above that accommodate deflection while maintaining the fire-rating of the wall assembly.
      a. Products:
         1) Same manufacturer as other framing materials.

H. Deflection and Firestop Track: Intumescent strip factory-applied to track flanges expands when exposed to heat or flames to provide a perimeter joint seal.
   1. Products:
      a. ClarkDietrich; BlazeFrame Firestop Deflection Track: www.clarkdietrich.com.
      b. Substitutions: See Section 01 6000 - Product Requirements.

I. Spring Isolated Ceiling Assembly
   1. General: Design, fabricate and install spring isolated ceiling assembly. Assembly shall be used directly under structural slab at designated areas. Isolated ceiling will be hung on spring isolators prior to hanging finish ceiling assemblies. All ductwork, plumbing, fire protection hung above this ceiling will be isolated so it does not provide a rigid connection between the structure and the isolated ceiling or the associated framing.
   2. Delegated Design: Design of spring isolated ceiling assembly shall include performance data including Airborne Sound Transmission Loss Test Report for testing in accordance with ASTM E90-90. Test reports shall document a minimum STC 84 for a spring isolated ceiling attached below a six-inch thick concrete slab and that consists of two layers of 5/8" thick gypsum board with 3 1/2" glass fiber batt insulation in the cavity between the slab and the top layer of gypsum board. Sound test reports shall be from an independent laboratory.
   3. Basis of Design: Kinetics Noise Control Model ICC.

J. Resilient Clip Isolated Ceiling Assembly
   1. General: Design, fabricate, and install resilient clip isolated ceiling assembly. Assembly shall be used directly under structural slab and framing at designated areas. Isolated ceiling will be hung on resilient clip isolators prior to hanging finish ceiling assemblies. All ductwork, plumbing, fire protection hung above this ceiling will be isolated so it does not provide a rigid connection between the structure and the isolated ceiling or the associated framing.
   2. Basis of Design: PAC International Model RSIC-1.

K. Resilient Partition Isolator Pads
   1. Partition isolation is to be included with delegated design for perimeter walls in Dance D101 above.
   2. Basis of Design: Kinetic Noise Control Resilient Partition Isolation Pad, Model Wallmart.

L. Metal Furring: Hat-Shaped Channel: Galvanized, 25 gauge, minimum depth of 7/8 inch (22mm).

M. Resilient Sealant:
   1. Acceptable Products for exposed and concealed joints.

a. AC 20 FTR Acoustical and Insulation Sealant, by Pecora Corporation.
b. Sheetrock Acoustical Sealant by USG.

2. Acceptable Products for concealed joints:
   a. BA-98 by Pecora.

2.02 BOARD MATERIALS

A. Manufacturers - Gypsum-Based Board:
   1. American Gypsum Company: www.americangypsum.com.
   2. CertainTeed Corporation: www.certainteed.com.
   3. Georgia-Pacific Gypsum: www.gpgypsum.com.
   4. Continental Building Products: www.continental-bp.com
   5. National Gypsum Company: www.nationalgypsum.com.
   6. PABCO Gypsum: www.pabcogypsum.com.
   7. USG Corporation: www.usg.com.
   8. Substitutions: See Section 01 6000 - Product Requirements.

B. Gypsum Wallboard: Paper-faced gypsum panels as defined in ASTM C1396/C1396M; sizes to minimize joints in place; ends square cut.
   1. Application: Use for vertical surfaces and ceilings, unless otherwise indicated.
   2. 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.
   3. Thickness:
      a. Vertical Sufaces: 5/8 inch typical, refer to drawings for other thicknesses required.
      b. Ceilings: 5/8 inch typical, refer to drawings for otther thicknesses required.
      c. Multi-Layer Assemblies: Thicknesses as indicated on drawings.

C. Backing Board For Wet Areas:
   1. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
   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. Application: Surfaces behind tile at shower walls and kitchen and serving walls.
      b. Thickness: 1/2 inch.
   3. Glass Mat Faced Board: Coated glass mat water-resistant gypsum backing panel as defined in ASTM C1178/C1178M.
      a. Application: Surfaces behind tile at toilet rooms and water fountains.
      b. Fire Resistant Type: Type X core, thickness 5/8 inch.

D. Backing Board For Non-Wet Areas: Water-resistant gypsum backing board as defined in ASTM C1396/C1396M; sizes to minimum joints in place; ends square cut.
   1. Application: Vertical surfaces behind thinset tile, except in wet areas.
   2. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
   3. At Assemblies Indicated with Fire-Rating: Use type required by indicated tested assembly; if no tested assembly is indicated, use Type X board, UL or WH listed.
   4. Type: Type X.
   5. Type X Thickness: 5/8 inch.
   6. Edges: Tapered.

E. Exterior Sheathing Board: Sizes to minimize joints in place; ends square cut.
   1. Application: Exterior sheathing, unless otherwise indicated.
   2. Glass Mat Faced Sheathing: Glass mat faced gypsum substrate as defined in ASTM C1177/C1177M.
   3. Core Type: Type X.
   4. Thickness: 5/8 inch.
   5. Edges: Square.

F. Exterior Parapet Wall Sheathing Board: Sizes to minimize joints in place; ends square cut.
   1. Application: Exterior sheathing at the inside face of parapet walls.
   2. Either product listed below may be used at Contractor's Option.
      a. Fiber-reinforced gypsum panels, ASTM C1278.
      b. Glass mat faced gypsum panels, ASTM C1177/C1177M.
   3. Type X Thickness: 5/8 inch (16 mm).
   4. Edges: Square, for vertical application.
   5. Products:
      a. USG Corporation; Securock Gypsum-Fiber Roof Board.
      b. Georgia-Pacific Gypsum LLC; DensDeck Prime.
      c. Substitutions: See Section 01 6000 - Product Requirements.

G. Shaftwall and Coreboard: Type X; 1 inch thick by 24 inches wide, beveled long edges, ends square cut.
   1. Paper-Faced Type: Gypsum shaftliner board or gypsum coreboard as defined ASTM C1396/C1396M; water-resistant faces.

2.03 JOINT TREATMENT MATERIALS

A. Joint Materials: ASTM C475/C475M and as recommended by gypsum board manufacturer for project conditions.
   1. Tape: 2 inch wide, creased paper tape for joints and corners, except as otherwise indicated.
   2. Ready-mixed vinyl-based joint compound.
   3. Chemical hardening type compound.

B. Comply with Gypsum Association GA-236.

C. Joint Tape:
   1. Interior Gypsum Board: Paper.
   2. Exterior Gypsum Soffit Board: Paper.
   3. Glass-Mat Gypsum Sheathing Board: 10-by-10 glass mesh.
   4. Tile Backing Panels: As recommended by panel manufacturer.

D. Joint Compound for Interior Gypsum Board: For each coat use formulation that is compatible with other compounds applied on previous or for successive coats.
   1. Prefilling: At open joints, rounded or beveled panel edges, and damaged surface areas, use setting-type compound.
   2. Embedding and First Coat: For embedding tape and first coat on joints, fasteners, and trim flanges, use drying-type, all purpose taping compound.
      a. Use all purpose compound for installing paper-faced metal trim accessories.
   3. Fill Coat: For second coat, use drying-type, all purpose, sandable compound.
   4. Finish Coat: For third coat, use drying-type, all purpose, sandable compound.
   5. Skim Coat: For final coat of Level 5 finish, use drying-type, all purpose, sandable compound.

E. Joint Compound for Exterior Applications:
   1. Exterior Gypsum Soffit Board: Use setting-type taping compound and setting- type, sandable topping compound.
   2. Glass-Mat Gypsum Sheathing Board: As recommended by sheathing board manufacturer.

F. Joint Compound for Tile Backing Panels:
   1. Glass-Mat, Water-Resistant Backing Panel: As recommended by backing panel manufacturer.
   2. Water-Resistant Gypsum Backing Board: Use drying-type, all purpose, sandable compound.

G. Acoustic Insulation: As specified in Section 07 2100.

H. Acoustic Sealant: Single component, non-hardening, non-skinning, sealant for use in conjunction with gypsum board.
   1. Place two sealant beads between top stud runner and structure and between bottom stud track and floor.
   2. Sealant at electrical box cutouts, and all abutting dissimilar materials on both sides of partitions.
   3. Manufacturers:
      a. Tremco; Acoustical Sealant: www.tremcosealants.com.
      b. Owens Corning; QuietZone: www.owenscorning.com.
      c. USG Corporation; Sheetrock Acoustical Sealant: www.usg.com.
      d. Specified Technologies, Inc.: www.stifirestop.com.
      e. Substitutions: See Section 01 6000 - Product Requirements.

I. Sealants (other than Acoustic): As sepcified in Section 07 9200.

J. Water-Resistive Barrier: As speicified in Section 07 2500.

K. Finishing Accessories: ASTM C1047, galvanized steel or rolled zinc, unless noted otherwise.
   1. General Types: As detailed on drawings or required for finished appearance.
   2. Special Shapes: In addition to conventional corner bead and control joints, provide L-bead at exposed panel edges.
   3. Special Shapes:
      a. J-Trim: 701-A, 801-A manufactured by USG.
      b. J-Stop: 401 manufactured by USG.
      c. Corner Beads: BEADEX manufactured by USG.
      d. L-Trim Molding: DRML-1250 manufactured by Fry Reglet Corporation.
      e. Reveal: DRM-50-50 and DRM-50-200 manufactured by Fry Reglet Corporation.
      f. F-Reveal: FDM-625-50 manufactured by Fry Reglet Corporation.
      g. Z-Reveal: DRMZ-625-50 manufactured by Fry Reglet Corporation.
      h. W-Reveal: DRWT-50-50 manufactured by Fry Reglet Corporation.
      i. Column Collar Reveal: Clear anodized aluminum molding with stainless steel adjustable band and PVC spacer for plaster manufactured by Fry Reglet Corporation.
      j. Other shapes as detailed on drawings.
   4. Manufacturers:
      a. Same manufacturer as framing materials.
      b. Phillips Manufacturing Co: www.phillipsmfg.com.
      c. Trim-tex, Inc.: www.trim-tex.com.
      d. USG: www.usg.com.
      e. Fry Reglet Corporation: www.fryreglet.com.
      f. Substitutions: See Section 01 6000 - Product Requirements.
   5. High Build Drywall Surfacer: Vinyl acrylic latex-based coating for spray application, designed to take the place of skim coating and separate paint primer in achieving Level 5 finish.
   6. Screws for Fastening of Gypsum Panel Products to Cold-Formed Steel Studs Less than 0.033 inch in Thickness and Wood Members: ASTM C1002; self-piercing tapping screws, corrosion resistant.
   7. Screws for Fastening of Gypsum Panel Products to Steel Members from 0.033 to 0.112 inch in Thickness: ASTM C954; steel drill screws, corrosion resistant.
   8. Anchorage to Substrate: Tie wire, nails, screws, and other metal supports, of type and size to suit application; to rigidly secure materials in place.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that project conditions are appropriate for work of this section to commence.

3.02 SHAFT WALL INSTALLATION

A. Shaft Wall Framing: Install in accordance with manufacturer's installation instructions.
   1. Fasten runners to structure with short leg to finished side, using appropriate power-driven fasteners at not more than 24 inches on center.
B. Shaft Wall Liner: Cut panels to accurate dimension and install sequentially between special friction studs.
   1. On walls over sixteen feet high, screw-attach studs to runners top and bottom.
   2. Seal perimeter of shaft wall and penetrations with acoustical sealant.

3.03 FRAMING INSTALLATION

A. Metal Framing: Install in accordance with ASTM C754 and manufacturer's instructions.
   1. Fire rated partitions to be installed in accordance with UL V450 or UL V438 or UL U419 .
   2. All "Sound Rated" partitions shall extend to floor/roof deck.
B. Runner Track Installation:
   1. Install continuous runner tracks sized to match studs. Align tracks accurately to layout at base and tops of studs. Secure with suitable fasteners for the type of construction involved spaced not more than 16 inches (406 mm) on center, as required by design to resist lateral forces. Provide fasteners at corner and ends of tracks (unless shown otherwise on drawings).
      a. To Concrete: Use stud nails, power driven fasteners.
      b. To Steel Deck: Use 3/4 inch (19 mm) long pan head framing screws.
C. Stud Erection:
   1. Studs shall be plumbed, aligned, fully seated in the bottom runner and securely attached to the flanges of both top and bottom runners by 2 each screw fastening method. Studs shall be one piece full length; splicing is not permitted (except as approved by the Architect / Engineer). Jack studs or cripples shall be installed below window sills, above window and door heads, and elsewhere to furnish supports, and shall be securely attached to connecting members. Provisions for vertical structural movement shall be provided where shown on the drawings. Lateral bracing shall be provided by use of steel studs, securely fastened to the structure.
   2. Openings: Reinforce openings as required for weight of doors, windows, etc., using not less than double studs at jambs.
D. Supplementary Partition Framing:
   1. Install supplementary framing, blocking and bracing in metal framing system wherever partitions are indicated to support fixtures, equipment, services, casework, heavy trim and furnishings and similar work requiring attachment to the partition.
   2. Frame wall openings with proper framing to accommodate the opening size and applied loads. Frame both sides of control joints with separate studs.
   3. At stud furring on exterior walls, provide braced connections to back up wall at each 10 feet of height.
E. Refer to drawings for additional requirements for bracing of metal stud walls.
F. Blocking: Install mechanically fastened steel sheet blocking for support of:
   1. Framed openings.
   2. Wall mounted cabinets.
   3. Plumbing fixtures.

4. Toilet partitions.
5. Toilet accessories.
6. Wall mounted door hardware.

3.04 ACOUSTIC ASSEMBLIES INSTALLATION

A. For all interior walls with insulation.
B. Acoustic Insulation: Place tightly within spaces, around cut openings, behind and around electrical and mechanical items within partitions, and tight to items passing through partitions.
   1. In walls with board on only one side, secure batts with plastic plumbers tape screwed to studs, 6" from top and bottom and every 24" OC (or similar method approved by architect) to prevent batts from falling out.
C. Acoustic Sealant: Install in accordance with manufacturer's instructions. and as follows
   1. Place two beads continuously on substrate before installation of perimeter framing members.
   2. Place continuous bead at perimeter of each layer of gypsum board.
   3. Seal around all penetrations by conduit, pipe, ducts, and rough-in boxes, except where firestopping is provided.

3.05 BOARD INSTALLATION

A. Comply with ASTM C840, GA-216, and manufacturer's instructions. Install to minimize butt end joints, especially in highly visible locations.
B. General - Install so trim and reinforcing tape is fully backed by gypsum wallboard. No hollow spaces over 1/8 inch (3 mm) wide are permitted.
C. Cutting Gypsum Board:
   1. Gypsum board shall be cut either by scoring and breaking or by sawing, working from the face paper side. When scoring, a sharp knife shall be used to cut through the face paper into the gypsum core. The gypsum board shall be snapped back away from the cut face. Back paper shall be cut. As an alternate to cutting the back paper, the back paper shall be broken by snapping the gypsum board in the reverse direction.
      a. All cut edges and ends of gypsum boards shall be smoothed where necessary to obtain neat fitting joints when the gypsum board is installed.
   2. Holes for pipes, fixtures or other small openings shall be scored on both the face and back before removal of the cut-out with a saw or special tool designed for this purpose.
   3. Where gypsum board meets projecting surfaces, the gypsum board shall be scribed and neatly cut.
D. Single Layer Application:
   1. Apply ceiling first (if gypsum board).
   2. Use board of length to give minimum number of joints.
   3. On walls over 9 feet (2743 mm) high and on ceilings, apply board perpendicular to support.
   4. On walls under 9 feet (2743 mm) high, apply board parallel to support.
   5. Stagger end joints. End and edge joints of board applied on ceilings shall occur over framing members or be back blocked with blocking. End joints of board horizontally applied on walls shall occur over framing member. Edge joints of board vertically applied on walls shall occur over framing members.
   6. Butt edges in moderate contact. Do not force in place. Shim to level.
   7. Leave facings true with joint, finishing flush. Vertical work shall be plumb and ceiling surfaces level.
   8. Scribe work closely. Keep joints as far from openings as possible. If joints occur near an opening, apply wallboard so vertical joints are centered over openings. No vertical joints shall occur within 8 inches (203 mm) of external corners or openings.

9. Install board tight against support with joints even and true. Tighten loose screws.
10. Caulk perimeter joints in sound insulated rooms with specified acoustical sealant.
11. Provide 1/2 inch (13 mm) maximum gap at floor to bottom of gypsum board.

E. Double Layer Application (if required):
1. Apply base layer as specified for single layer application.
2. Apply face layer with joints staggered in relationship to base and occurring over supports. Use combination of adhesive and screws to meet Manufacturer's specifications for fire-rated assembly. Apply screws attaching face layer through base layer into support for specified penetration.

F. Fastening:
1. Apply from center of wallboard towards ends and edges.
2. Apply screws 3/8 inch (10 mm) minimum from ends and edges, 1 inch (25 mm) maximum from edges, and 1/2 inch (13 mm) maximum from ends.
3. Set screw heads 1/32 inch (0.8 mm) below plane of board, but do not break face paper. If face is accidentally broken, apply additional screw 2 inches (50 mm) away.
4. Screws on adjacent ends or edges shall be opposite each other.
5. Drive screws with shank perpendicular to face of board.
6. Walls (1-hour and 2-hour rated):
   a. Shall be 1-1/8 inch (29 mm) Type "S" bugle head screws. Spacing to be 8 inches (203 mm) on center at perimeter of wall and 8 inches (203 mm) on center vertically at each stud.
   b. Shall be 1-5/8 inch (41 mm) Type "S" bugle head screws at 2 layer installations.
7. Walls (non rated): Shall be 1 inch (25 mm) Type "S" bugle head screws; spacing to be 8 inches (203 mm) on center at perimeter of wall and panels, and 12 inches (305 mm) on center vertically at remaining studs.
   a. Also occurs at 5/8 inch (16 mm) gypsum board to (RC-1) resilient channel framing.
8. Suspended ceilings and soffits:
   a. Shall be 1-1/8 inch (29 mm) Type "S" bugle head screws. Spacing to be 8 inches (203 mm) on center at perimeters if panels and 8 inches (203 mm) on center at remaining channels spaced 24 inches (610 mm) on center.
   b. Shall be 1-5/8 inch (41 mm) Type "S" bugle head screws at 2 layer installations.

G. Fire-Rated Construction: Install gypsum board in strict compliance with requirements of assembly listing.

H. 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-resistive barrier.

I. Cementitious Backing Board: Install over steel framing members and plywood substrate where indicated, in accordance with ANSI A108.11 and manufacturer's instructions.

3.06 INSTALLATION OF TRIM AND ACCESSORIES

A. Control Joints: Place control joints consistent with lines of building spaces and as follows:
1. Not more than 30 feet apart on walls and ceilings over 50 feet long.

B. Corner Beads: Install at external corners, using longest practical lengths.

C. Edge Trim: Install at locations where gypsum board abuts dissimilar materials.

3.07 JOINT TREATMENT

A. Glass Mat Faced Gypsum Board and Exterior Glass Mat Faced Sheathing: Use fiberglass joint tape, embed and finish with setting type joint compound.

B. Paper Faced Gypsum Board: Use paper joint tape, bedded with ready-mixed vinyl-based joint compound and finished with ready-mixed vinyl-based joint compound.

1. Unfinished Gypsum Board Surfaces, Above Ceilings, Behind Cabinetry and Under Acoustical Tile:
    a. GA-214 **Level Two** - All joints and interior angles shall have tape embedded in joint compound and one separate coat of joint compound applied over all joints, angles, fastener heads, and accessories. Surface shall be free of excess joint compound. Tool marks and ridges are acceptable, except under acoustical tile. Includes fire and sound rated walls.
2. Gypsum Board Surfaces in Mechanical, Storage, and Utility Areas to Receive Paint:
    a. GA-214 **Level Three** - All joints and interior angles shall have tape embedded in joint compound and two separate coats of joint compound applied over all joints, angles, fastener heads, and accessories. All joint compound shall be smooth and free of tool marks and ridges.
    b. Gypsum Board Surfaces to Receive Paint (standard wall finish):
    c. GA-214 **Level Four** - All joints and interior angles shall have tape embedded in joint compound and three separate coats of joint compound applied over all joints, angles, fastener heads, and accessories. All joint compound shall be smooth and free of tool marks and ridges.
3. Gypsum Board Surfaces to Receive Paint, (only those surfaces noted on plans):
    a. GA-214 **Level Five** - All joints and interior angles shall have tape embedded in joint compound and three separate coats of joint compound applied over all joints, angles, fastener heads, and accessories. A thin skim coat of joint compound, or a material manufactured especially for this purpose, shall be applied to the entire surface. The surface shall be smooth and free of tool marks and ridges.

C. Where Level 5 finish is indicated, spray apply high-build drywall surfacer over entire surface after joints have been properly treated; achieve a flat and tool mark-free finish.
D. Fill and finish joints and corners of cementitious backing board as recommended by manufacturer.

3.08 TOLERANCES

A. Maximum Variation of Finished Gypsum Board Surface from True Flatness: 1/8 inch in 10 feet in any direction.

3.09 WORKMANSHIP

A. Holes for electrical outlets and for other purposes shall be accurately sized to fit. Any holes not able to be covered because of faulty cutting and workmanship shall be repaired to the satisfaction of the Architect.
B. Any rough joints, popped screws, poor application, or finish shall be repaired before any painting is performed.
C. Inspection of work with painter and Architect will be done after work is assumed completed in order to make any changes or corrections in the Work or material.

END OF SECTION 09 2116

This page intentionally left blank

SECTION 09 2220

GYPSUM BOARD METAL SUSPENSION SYSTEMS

PART 1 – GENERAL

1.01 SECTION INCLUDES

A. Furnish all labor, materials, equipment, tools and services required to fully complete all Gypsum Board Metal Suspension System work as is indicated on the drawings and/or specified herein including, but not limited to, the following described items:
B. Gypsum board metal suspension system.
C. Do not include sales tax, refer to Section 00 1115 - Advertisement for Prequalification of Bidders.

1.02 RELATED SECTIONS

A. Section 09 2116 - Gypsum Board Assemblies
B. Section 09 5100 - Acoustic Ceilings.
C. Division 23 (15) - Heating, Ventilating and Air Conditioning (HVAC).
D. Division 26 (16) - Electrical.

1.03 REFERENCES

A. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Required Hardness, Solution Hardened, and Bake Hardenable; 2021a.
B. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2022.
C. 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; 2020.
D. ASTM C635/C635M - Standard Specification for the Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings; 2017.
E. ASTM C636/C636M - Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels; 2013.
F. ASTM C645 - Standard Specification for Nonstructural Steel Framing Members; 2018.
G. ASTM C754 - Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products; 2020.
H. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials; 2020.
I. CISCA (AC) - Acoustical Ceilings: Use and Practice; 1999.
J. UL (FRD) - Fire Resistance Directory; Current Edition.

1.04 SUBMITTALS

A. Product Data
    1. Submit manufacturer’s published technical information for each product indicated
B. Shop Drawings
    1. Submit reflected ceiling plans drawn to scale prescribed by Architect
        a. Include coordinated penetrations and ceiling-mounted items
        b. Include any necessary details or drawings from the manufacturer regarding recommended installation
C. Samples

1. Submit 12 inch long samples of suspension system components, including main runner, cross tee, wall angle
2. Submit representative manufacturer's sample of each suspension member indicated

D. Certifications
1. Provide manufacturer's written certification that products submitted meet or exceed all specified requirements

E. Evaluation Report
1. Submit manufacturer's ICC-ES Evaluation Service Report

1.05 QUALITY ASSURANCE

A. Source Limitations
1. Drywall Suspension System
a. Obtain all drywall framing components through one source from a single manufacturer

B. Installer Qualifications
1. Must be experienced in the installation of systems similar to those specified herein

C. Fire Resistance Ratings
1. When drywall ceiling is functioning as the fire protective barrier, specific performance is referenced in UL (FRD) UL Fire Resistance Directory, tested according to ASTM E119. Installation in accordance with specific UL Design referenced.

1.06 DELIVERY, STORAGE AND HANDLING

A. Delivery of drywall suspension system will be in the original unopened packages with the manufacturer's label intact

B. Handling and storage should be in accordance with the manufacturer's Material Safety Data Sheets (MSDS)

C. Product cartons should be handled carefully to avoid damage

1.07 COORDINATION

A. Coordinate the installation of the drywall suspension system with any and all trades whose work is impacted by that installation

1.08 EXTRA MATERIALS

A. Provide extra materials in the manufacturer's unopened packaging, with the manufacturer's label intact, as detailed below
1. Suspension System Components – Minimum 5% of each type installed

PART 2 - PRODUCTS

2.01 MANUFACTURER

A. Basis of Design:
1. CertainTeed Ceilings: www.certainteed.com

B. Other approved manufacturers, subject to compliance with requirements.
1. Armstrong World Industries, Inc: www.armstrong.com
2. Chicago Metallic Corporation: www.chicagometallic.com
3. USG: www.usg.com

2.02 SUSPENSION SYSTEM

A. Manufacturer: CertainTeed Ceilings

B. Product

1. Name: 1-1/2” Drywall System

C. Physical Characteristics
   1. Double web design manufactured of hot-dipped galvanized steel in accordance withASTM A653/A653M, and ASTM A1008/A1008M
   2. Knurled face for ease of screw installation
   3. Cross-tees feature staked-on end tabs to facilitate tightness, ease of installation
   4. System incorporates G40 hot-dipped galvanization as standard galvanization
      a. G90 available in components for extreme or exterior environments

D. Components
   1. Main Runners
      a. DWS12-13-20
         1) Size: L:144” x H:1.6” x W:1.5”
         2) DWS12-13-20 G90 [available G90 galvanization]
   2. Cross Tees
      a. DWS1.16-13-20
         1) Size: L:14” x H:1.6” x W:1.5”
      b. DWS2-13-20
         1) Size: L:24” x H:1.6” x W:1.5
      c. DWS2.16-13-20
         1) Size: L:26” x H:1.6” x W:1.5”
      d. DWS3-13-20
         1) Size: L:36” x H:1.6” x W:1.5”
         2) DWS3-13-20 G90: [available G90 galvanization]
      e. DWS4-13-20
         1) Size: L:48” x H:1.6” x W:1.5”
      f. DWS4.16-13-20
         1) Size: L:50” x H:1.6” x W:1.5”
      g. DWS6-13-20
         1) Size: L:72” x H:1.6” x W:1.5”
         2) DWS6-13-20 G90: [available G90 galvanization]
   3. Wall Molding
      a. DWA1.5-1.5
         1) Size: L:144” x Leg1: 1.5” x Leg2: 1.5”
         2) DWA1.5-1.5 G90: [available G90 galvanization]
      b. DWA2-2
         1) Size: L:144” x Leg1: 2” x Leg2: 2”

E. Structural Classification
   1. Main Runners classified as heavy duty, per ASTM C635/C635M and ASTM C645
   2. Suspension system shall be sized to not deflect more than 1/360th of the span

PART 3 – EXECUTION

3.01 EXAMINATION

A. Ascertain acceptability of substrates and building conditions under which the ceiling system is to be installed. Do not proceed with the installation until any and all unacceptable conditions have been rectified. The CertainTeed Drywall System can be installed in both interior and exterior applications.

3.02 INSTALLATION

A. Install the ceiling system in accordance with the following:
   1. Manufacturer’s printed instructions

2. ASTM C636/C636M
3. ASTM C754
4. ASTM C1002
5. Ceilings & Interior Systems Construction Association CISCA (AC) recommendations
6. Applicable local code requirements
7. Approved shop drawings

END OF SECTION 09 2220

SECTION 09 2513

DIRECT APPLIED EFS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Furnish all labor, materials, equipment, tools and services required to fully complete all Direct Applied Exterior Finish System work as is indicated on the drawings and/or specified herein including, but not limited to, the following described items.
   1. Direct applied EFS on exterior soffits
B. Do not include sales tax, refer to Section 00 1115 - Advertisement for Prequalification of Bidders.

1.02 RELATED REQUIREMENTS

A. Section 09 2116 - Gypsum Board Assemblies: Glass mat gypsum substrate.

1.03 SUBMITTALS

A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used. Include manufacturer's Material Safety Data Sheets.

1.04 REFERENCES

A. ISO 14001 - Environmental Management System; 2015.
B. ISO 9001 - Quality management systems -- Requirements; 2015.
C. SCAQMD 1113 - Architectural Coatings; 1977 (Amended 2016).

1.05 QUALITY ASSURANCE

A. Manufacturer's Qualifications: The textured finish system manufacturer shall be a company with at least thirty five years of experience in manufacturing specialty finishes and regularly engaged in the manufacture and marketing of products specified herein. The manufacturer shall have an ISO 9001 certified quality system and ISO 14001 certified environmental management system.
B. Installer's Qualifications: The contractor shall be qualified to perform the work specified by reason of experience. Contractor shall have at least 5 years of experience in commercial textured finish application, and shall have completed at least 3 projects of similar size and complexity. Contractor shall provide proof before commencement of work that he/she will maintain and supervise a qualified crew of applicators through the duration of the work. When requested Contractor shall provide a list of the last three comparable jobs including the name, location, and start and finish dates for the work.
C. Mock-ups: The contractor shall install a mock-up of the system for evaluation and approval by the design professional, building owner, or owner’s representative/quality assurance agent.
D. Testing: Testing shall be conducted as directed by the design professional, building owner, or owner’s representative/quality assurance agent to verify soffit/ceiling assembly performance and adhesion to prepared substrates.

1.06 DELIVERY, STORAGE AND HANDLING

A. Deliver products in original packaging, labeled with product identification, manufacturer, and batch number.
B. Store products in a dry area with temperature maintained between 50 and 85 degrees F (10 and 29 degrees C). Protect from direct sunlight. Protect from freezing. Protect from extreme heat (>90 degrees F [32 degrees C]).

C. Handle products in accordance with manufacturer's printed instructions.

1.07 WARRANTY

A. Provide manufacturer’s standard limited warranty.
B. The Contractor shall guarantee his work for a period of One (1) year from date of Substantial Completion. Guarantee shall be on form included in Section 01 7800.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Basis of Design Manufacturer:
   1. STO Corporation; www.stocorp.com.
B. Subject to compliance with requirements of this section the following manufacturers are acceptable:
   1. BASF Wall Systems; www.wallsystems.basf.com.
   2. Master Wall, Inc; www.masterwall.com.
   3. Parex USA, Inc; www.parex.com.
   4. Dryvit Systems, Inc: www.dryvit.com.
   5. Substitutions: See Section 01 6000 - Product Requirements.

2.02 MATERIALS

A. Textured Finishes (select one):
   1. Stolit – high performance decorative and protective acrylic-based textured wall finish with integral color, complies with SCAQMD 1113 for architectural finishes.
   2. Sto Essence DPR – high performance decorative and protective textured wall finish with integral color, complies with SCAQMD Rule 1113 for architectural finishes.
B. Primer:
   1. Sto Primer – acrylic-based sanded primer, complies with SCAQMD Rule 1113 for primers.
C. Base Coat (select one)
   1. Sto BTS Plus – one component polymer modified portland cement high build base coat
   2. Sto Primer/Adhesive-B – one component polymer modified portland cement base coat
D. Surface Reinforcement:
   1. Sto Mesh – nominal 4.5 oz/yd2 (153 g/m2) glass fiber reinforcing mesh treated forcompatibility with Sto materials

PART 3 EXECUTION

3.01 INSTALLATION

A. General Surface Preparation:
   1. Gypsum soffit board must be installed in conformance with the applicable building code and manufacturer’s written installation instructions. Gypsum soffit board surface must be clean, dry, and free of surface contamination. Gypsum soffit board surface shall not have planar irregularities in excess of 1/16 inch (1.6 mm) and shall be free of voids, cracks, and other surface defects.
B. Mixing:
   1. Mix Sto products in accordance with published literature. Refer to applicable Product Bulletins for specific information on use, handling, application, precautions, and limitations of specific products.
C. Application:

1. Install corrosion proof termination accessories with perforated flanges for keying of the base coat at junctures with penetrations such as soffit vents, electrical fixtures, and with abutting walls and columns. Install corrosion proof control joints with perforated flanges for keying of the base coat at intervals as required by the gypsum soffit board manufacturer. Refer to Sto Guide details.
2. Install nominal 1/8 inch (3 mm) base coat by trowel to the soffit/ceiling board surface. Work horizontally or vertically in strips of 40 inches (1016 mm), and immediately embed the mesh into the wet base coat by troweling from the center to the edge of the mesh. Overlap mesh not less than 2-½ inches (64 mm) at mesh seams and feather at seams. Double wrap all inside and outside corners with minimum 8-inch (203 mm) overlap in each direction (except where corner bead is used at outside corners lap mesh over perforated flange of accessory). Avoid wrinkles in the mesh. The mesh must be fully embedded so that no mesh color shows through the base coat when it is dry. Re-skim with additional base coat if mesh color is visible. Overlap perforated flanges of accessories with the base coat/reinforcing mesh application. Do not install base coat and mesh onto solid (unperforated) portions of accessories.
3. When the base coat application is dry apply the primer by brush or roller to the entire base coat surface.
4. When the primer application is dry apply the textured finish by trowel. Apply finish in a continuous application, and work to a wet edge. Float the finish to achieve the desired texture.

D. Protection:
1. Provide protection of installed materials from water infiltration into or behind them during and after construction.
2. Provide protection of installed materials from dust, dirt, precipitation, freezing and continuous high humidity until they are fully dry.
3. Seal penetrations through the finished surface with backer rod and sealant or other appropriate means.

END OF SECTION 09 2513

This page intentionally left blank

SECTION 09 3000

TILING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Furnish all labor, materials, equipment, tools, and services required to fully complete all Tiling work as is indicated on the drawings and/or specified herein including, but not limited to, the following described items.
B. Tile for floor applications.
C. Tile for wall applications.
D. Tile for shower receptors.
E. Tile for stairs.
F. Thresholds.
G. Ceramic trim.
H. Non-ceramic trim.
I. Pre-cast concrete stair tread installation.
J. Movement joint material.
K. Do not include sales tax, refer to Section 00 1115 - Advertisement for Prequalification of Bidders.

1.02 RELATED REQUIREMENTS

A. Section 03 4500 - Pre-cast architectural concrete: Fabrication of stair treads.
B. Section 07 9200 - Joint Sealants: Sealing joints between tile work and adjacent construction and fixtures.
C. Section 09 0561 - Common Work Results for Flooring Preparation: Independent agency testing of concrete slabs, cleaning, and preparation.
D. Section 09 2116 - Gypsum Board Assemblies: Tile backer board.
E. Division 22 - Plumbing Fixtures.

1.03 REFERENCE STANDARDS

A. ANSI A108/A118/A136 - American National Standard Specifications for the Installation of Ceramic Tile (Compendium); 2019.
B. ANSI A108.1b - Installation of Ceramic Tile on a Cured Portland Cement Mortar Setting Bed with Dry-Set, Modified Dry-Set, or Improved Modified Dry-Set Cement Mortar; 2023.
C. ANSI A108.1c - Contractor's Option: Installation of Ceramic Tile in the Wet-Set Method with Portland Cement Mortar or Installation of Ceramic Tile on a Cured Portland Cement Mortar Setting Bed with Dry-Set, Modified Dry-Set, or Improved Modified Dry-Set Cement Mortar; 2023.
D. ANSI A108.2 - American National Standard General Requirements: Materials, Environmental and Workmanship; 2019.
E. ANSI A108.4 - American National Standard Specifications for Installation of Ceramic Tile with Organic Adhesive or Water Cleanable Tile-Setting Epoxy Adhesive; 2023.
F. ANSI A108.5 - American National Standard Specifications for Installation of Ceramic Tile with Dry-Set Portland Cement Mortar or Latex-Portland Cement Mortar; 1999 (Reaffirmed 2010).
G. ANSI A108.6 - American National Standard Specifications for Installation of Ceramic Tile with Chemical Resistant, Water Cleanable Tile-Setting and -Grout Epoxy; 2023.
H. ANSI A108.8 - American National Standard Specifications for Installation of Ceramic Tile with Chemical Resistant Furan Resin Mortar and Grout; 1999 (Reaffirmed 2024).

I. ANSI A108.9 - American National Standard Specifications for Installation of Ceramic Tile with Modified Epoxy Emulsion Mortar/Grout; 2023.
J. ANSI A108.10 - American National Standard Specifications for Installation of Grout in Tilework; 2017 (Reaffirmed 2022).
K. ANSI A108.12 - Installation of Ceramic Tile with EGP (Exterior Glue Plywood) Modified Dry-Set Mortar; 2023.
L. ANSI A118.3 - American National Standard Specifications for Chemical Resistant, Water Cleanable Tile-Setting and -Grouting Epoxy and Water Cleanable Tile-Setting Epoxy Adhesive; 2021.
M. ANSI A118.5 - American National Standard Specifications for Chemical Resistant Furan Mortars and Grouts for Tile Installation; 1999 (Reaffirmed 2021).
N. ANSI A118.6 - American National Standard Specifications for Standard Cement Grouts for Tile Installation; 2019.
O. ANSI A118.7 - American National Standard Specifications for High Performance Cement Grouts for Tile Installation; 2019.
P. ASTM F710 - Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring; 2021.
Q. ASTM F1869 - Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride; 2016a.
R. ASTM F2170 - Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes; 2019a.
S. TCNA (HB) - Handbook for Ceramic, Glass, and Stone Tile Installation; 2021.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene a preinstallation meeting one week before starting work of this section; require attendance by affected installers.

1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.
B. Product Data: Provide manufacturers' data sheets on tile, mortar, grout, and accessories. Include instructions for using grouts and adhesives.
C. Shop Drawings: Indicate tile layout, patterns, color arrangement, perimeter conditions, junctions with dissimilar materials, control and expansion joints, thresholds, ceramic accessories, and setting details.
D. Samples: Provide samples equal to 12 inches by 12 inches of every size, color and type.
E. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
F. Installer's Qualification Statement:
G. Maintenance Data: Include recommended cleaning methods, cleaning materials, and stain removal methods.
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 Tile: 2 percent of each size, color, and surface finish combination, but not less than 20 of each type.

1.06 QUALITY ASSURANCE

A. Maintain one copy of and ANSI A108/A118/A136 and TCNA (HB) on site.
B. Manufacturer Qualifications: Company specializing in manufacturing the types of products specified in this section, with minimum five years of documented experience.
C. Installer Qualifications: Company specializing in performing tile installation, with minimum of five years of documented experience.

1.07 MOCK-UPS

A. See Section 01 4000 - Quality Requirements for general requirements for mock-up.
B. Construct mock-up of Porcelain and Ceramic tiles with edge protection, incorporating all components specified.
    1. Minimum size of mock-up is 8 feet by 10 feet (2.4 m by 3 m) or as directed by Architect.
    2. When approved by Architect, mock-up shall become the acceptable standard of finish
    3. quality and workmanship for remainder of on-site work.
    4. Approved mock-up may remain as part of the Work, if undisturbed at time of substantial completion at the discretion of the Architect.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Protect adhesives from freezing or overheating in accordance with manufacturer's instructions.

1.09 FIELD CONDITIONS

A. Do not install solvent-based products in an unventilated environment.
B. Maintain ambient and substrate temperature above 50 degrees F and below 100 degrees F during installation and curing of setting materials.

1.10 GUARANTEE

A. This Contractor shall guarantee his work for a period of One (1) year from date of Substantial Completion. Guarantee shall be in form found in Section 01 7800.

PART 2 PRODUCTS

2.01 TILE

A. Manufacturers: All products by the same manufacturer.
    1. Basis of Design: Dal-Tile Corporation: www.daltile.com.
    2. American Olean Corporation: www.americanolean.com.
    3. Dal-Tile Corporation: www.daltile.com.
    4. Substitutions: See Section 01 6000 - Product Requirements.
B. Floor Tile Type **F6 and F7:** Colorbody Porcelain Mosaic ANSI A137.1, and as follows:
    1. Product: Keystones Mosaic Tile, by Daltile Corporation.
    2. Composition: Unglazed Porcelain.
    3. Size and Shape: 2 inch square by 1/4 inch thick.
    4. Pattern: Random Medley.
    5. Colors: As selected by Architect.
        a. Color No 1: 70 percent, Group 1.
        b. Colors No. 2 and 3: 10 percent each, Color Group 3.
        c. Color No. 4: 10 percent, Color Group 5.
C. Floor Tile Type **F8**: ANSI A137.1, and as follows:
    1. Product: Quarry Textures by Daltile Corporation.
    2. Composition: Quarry.
    3. Finish: Non-abrasive.
    4. Size and Shape: 8 inches by 8 inches by 1/2 inch.
    5. Colors: As selected by Architect.
D. Floor Tile Type **F10**: Porcelain ANSI A137.1, and as follows:
    1. Product: Volume 1.0, by Daltile Corporation.
    2. Composition: Glazed Porcelain.
    3. Size and Shape: 12 inches by 24 inches by 5/16 inch.
    4. Colors: as selected by Architect.

5. Non-ceramic trim:
    a. Type 2 - Stair Nosing Profile (where occurs).
    b. Type 4 - Tile to VCT transition.

E. Base Tile Type **B4**: Porcelain ANSI A137.1, and as follows:
1. Product: Median by Daltile Corporation.
2. Composition: Solidbody Porcelain.
3. Size and Shape: 6 inches by 24 inches (cut tile).
4. Colors: As selected by Architect.
5. Non-ceramic trim:
    a. Type 1 - profile for Walls and Tile Base (where no tile above).
    b. Type 3 - Cove-Shaped Profile.

F. Base Tile Type **B5**: Porcelain ANSI A137.1, and as follows:
1. Product: Median by Daltile Corporation.
2. Composition: Solidbody Porcelain.
3. Size and Shape: 6 inches by 24 inches (cut tile).
4. Colors: As selected by Architect.
5. Non-ceramic trim.
    a. Type 1 - Profile for Walls and Tile Base (where no tile above).

G. Floor Tile Type **B6**: ANSI A137.1, and as follows:
1. Product: Quarry Textures by Daltile Corporation.
2. Composition: Quarry.
3. Finish: Non-abrasive.
4. Size and Shape: 5 inches by 6 inches by 1/2 inch.
5. Colors: As selected by Architect.

H. Base Tile Type **B3**: Ceramic ANSI A137.1, and as follows:
1. Product: Semi-Gloss / Matte Ceramic Tile, by Daltile Corporation.
2. Composition: Glazed Ceramic.
3. Size and Shape: 6 inches by 6 inches by 5/16 inch - coved.
4. Colors: As selected by Architect.
    a. Field color: Price group 1.

I. Base Tile Type **B1**: Ceramic ANSI A137.1, and as follows:
1. Product: Color Wheel Linear, by Daltile Corporation.
2. Composition: Glazed Ceramic.
3. Size and Shape: 6 inches by 12 inches by 5/16 inch - coved.
4. Colors: As selected by Architect.
    a. Field Color: Price Group 1.

J. Wall Tile Type **W6**: Ceramic ANSI A137.1, and as follows:
1. Product: Linear, by Daltile Corporation.
2. Composition: Glazed Ceramic.
3. Size and Shape: 4 inches by 12 inches by 5/16 inch.
4. Pattern: Stack bond (vertical and horizontal, refer to Drawings).
5. Colors: As selected by Architect.
    a. Field Color: Price Group 2.
    b. Accent Color: 20 percent Price Group 3.

K. Wall Tile Type **W7**: Porcelain ANSI A137.1, and as follows:
1. Product: Median, by Daltile Corporation.
2. Composition: Glazed Porcelain.
3. Size and Shape: 12 inches by 24 inches by 5/16 inch.
4. Pattern: Stack bond.
5. Colors: As selected by Architect.
    a. Accent Tile: As shown on drawings.

6. Non-ceramic trim:
    a. Type 1 - Profile for Walls and Tile Base.

L. Wall Tile Type **W8**: Ceramic ANSI A137.1, and as follows:
1. Product: Semi-Gloss / Matte Ceramic Tile, by Daltile Corporation.
2. Composition: Glazed Ceramic.
3. Size and Shape: 6 inches by 6 inches by 5/16 inch.
4. Colors: As selected by Architect.
    a. Field color: price group 1.

M. Wall Tile Type **W9:** Ceramic ANSI A137.1, and as follows:
1. Product: Linear, by Daltile Corporation.
2. Composition: Glazed Ceramic.
3. Size and Shape: 8 inches by 24 inches by 3/8 inch.
4. Pattern: Stack bond
5. Colors: As selected by Architect.
    a. Non-ceramic trim:
    b. Type 1 - Profile for Walls and Tile Base.

N. Wall Tile Type **W10**: Porcelain ANSI A137.1, and as follows:
1. Product: Tile: Median, by Daltile Corporation.
2. Composition: Glazed Porcelain.
3. Size and Shape: 12 inches by 24 inches by 5/16 inch.
4. Pattern: Stack bond.
5. Colors: As selected by Architect.
    a. Accent tile: As shown on drawings.
6. Non-ceramic trim:
    a. Type 1 - Profile for Walls and Tile Base.

2.02 CERAMIC TRIM AND ACCESSORIES

A. Tile with coved base: Matching bullnose, bullnose corner, cove/inside finger cove, radius cap, cove base, cove base corner and outcorner, straight base, and straight base corner and outcorner shapes in sizes coordinated with field tile.

2.03 NON-CERAMIC TRIM AND ACCESSORIES:

A. Non-Ceramic Trim: Satin Anodized Aluminum Finish.
1. Basis of Design Manufacturer: Schluter Systems: www.schluter.com.Schluter-JOLLY - Typical Edge Protection.
2. Type 1 - Profile for Walls and Tile Base.
    a. Schluter-JOLLY - Typical Edge Protection.
        1) Description: Profile with square visible surface, integrated trapezoid-perforated anchoring leg, and integrated grout joint spacer. Use at top of tile base, at all outside corners and at any perimeter locations where tile edge is exposed. Terminations at door and window frames and as detailed in drawings.
        2) Corners:
            (a) Provide with matching outside corners.
            (b) Provide with matching end caps.
            (c) Provide with matching connectors.
        3) Material and Finish:
            (a) AE - Satin Anodized Aluminum.
                (1) Height as required to coordinate with tile selection and setting system selected.
3. Type 2 - Stair Nosing Profile.
    a. Schluter-TREP-S - Tile Stair Treads/Risers.

1) Description: Profile with replaceable, ribbed, 1 1/32 inch (26 mm) wide, thermoplastic rubber exposed surface with rounded leading edge, and aluminum support section with integrated trapezoid-perforated anchoring leg.
2) End Caps: Provide with matching end caps.
3) Tread Color:
(a) GS - Black.
(1) Height as required to coordinate with tile selection and setting system selected.

4. Type 3 - Cove Shaped Profile.
a. Schluter-DILEX-AHK - Typical.
1) Description: Anodized aluminum profile with integrated trapezoid-perforated anchoring legs, connected at a 90-degree angle by a cove-shaped section with 3/8 inch (10 mm) radius that forms the visible surface.
2) Corners:
(a) Provide with matching outside corners.
(b) Provide with matching end caps.
(c) Provide with matching connectors.
3) Material and Finish:
(a) AE - Satin Anodized Aluminum.
(1) Height as required to coordinate with tile selection and setting system selected.

5. Type 4 - Transition Profiles for Floors.
a. Schluter-RENO-U (non-recessed) Tile - to - VCT.
1) Description: Profile with sloped exposed surface, 5/32 inch (4 mm) tall leading edge, integrated trapezoid-perforated anchoring leg, and integrated grout joint spacer.
b. Material and Finish:
1) AE - Satin Anodized Aluminum.
(a) Height as required to coordinate with tile selection and setting system selected.

B. Thresholds: Marble, gray, honed finish; 2 inches wide by full width of wall or frame opening; 1/2 inch thick; beveled on long edge with radiused corners on top side; without holes, cracks, or open seams.

2.04 SETTING MATERIALS

A. All setting products shall be supplied by a single source supplier.
B. Provide setting materials produced by the same manufacturer as the grout.
C. Manufacturers:
1. Mapei Corporation: www.mapei.com.
2. CUSTOM Building Products: www.custombuildingproducts.com.
3. LATICRETE International, Inc: www.laticrete.com.
4. Substitutions: See Section 01 6000 - Product Requirements.
D. Latex-Portland Cement Mortar Bond Coat: ANSI A118.4.
1. For floor/wall tile over waterproofing or crack isolation membrane mortar shall comply with ANSI A118.4 ISO 13007 C2S1 or better.
2. For floor tile on suspended slabs mortar shall comply with ANSI A118.4 or better, or ISO 13007 C2S1 or better.
3. For tile elsewhere mortar shall comply with ANSI A118.4 or better, or ISO 13007 C2 or better.
E. Epoxy Adhesive and Mortar Bond Coat:
1. At Floors: ANSI A118.3 and ISO 13007 RG or better.

2. At Walls: ANSI A118.3 and ISO 13007 R1 or better.
3. Applications: Kitchen walls, Shower walls and floors, Restroom floors, Locker Room floors.

2.05 THICK BED SETTING MATERIALS

A. Mortar Bed Materials:
   1. Portland Cement: ASTM C 150, type 1, gray or white.
   2. Hydrated Lime: ASTM C 207, Type S.
   3. Sand: ASTM C 144, fine.
   4. Latex Additive: Keraply by Mapei or equal.
   5. Water: Clean and potable.
   6. Mix Ratios:
      a. Floors: Cement and sand at 1:5.
      b. Walls: Cement, sand, and lime at 1:5:1/2 to 1:7:1.

B. Reinforcing Mesh: 2 inch by 2 inch size weave of 16/16 wire size; welded fabric, galvanized; ANSI A108.1a.
   1. Required in all Thick Beds.

2.06 GROUTS

A. Acceptable Manufacturers:
   1. Mapei Corporation: www.mapei.com.
   2. CUSTOM Building Products: www.custombuildingproducts.com.
   3. LATICRETE International, Inc: www.laticrete.com.
   4. Substitutions: See Section 01 6000 - Product Requirements.

B. All in One grout for joints from 1/16 inch to 3/4 inch.
   1. Ultracolor Plus FA by Mapei.

C. Sanded Grout: High-Performance, quick-set, polymer modified grout complying with ANSI A118.6, ANSI A118.7 and ISO 13007 CG2WAF, for joints between 1/8 inch wide and greater.
   1. Acceptable Products:
      a. Ultracolor Plus by Mapei.
      b. Prism by Custom.
   2. Colors: To be selected by Architect from manufacturer's full range.

D. Non-Sanded Grout: Premium Grade, polymer modified unsanded, Portland cement tile grout. Complies with: ANSI A118.6 and ISO 13007 CG2WAF, for joints less than 1/8 inch wide.
   1. Acceptable Products:
      a. Keracolor U by Mapei.
      b. Polyblend by Custom.
   2. Colors: To be selected by Architect from manufacturer's full range.

E. Epoxy Grout: Industrial grade, 100 percent solids, epoxy grout complying with: ANSI A118.3, ANSI A118.5, ISO 13007 RG.
   1. Chemical resistant and water-cleanable epoxy grout.
   2. Acceptable Products:
      a. Kerapoxy IEG CQ by Mapei.
      b. CEG-IG by Custom.
   3. Colors: To be selected by Architect from manufacturer's full range.
   4. Applications: Kitchen walls, Shower walls and floors, Restroom floors, Locker Room floors.

2.07 ACCESSORY MATERIALS

A. Acceptable Manufacturers:

1. Mapei Corporation: www.mapei.com.
2. Custom Building Products: www.custombuildingproducts.com.
3. LATICRETE International, Inc: www.laticrete.com.
4. Schluter-Systems: www.schluter.com.
5. Substitutions: See Section 01 6000 - Product Requirements.

B. Concrete Floor Slab Crack Isolation Membrane: Material complying with ANSI A118.12; not intended as waterproofing.
   1. Type: Fluid-applied.
   2. Thickness: 20 mils, maximum.
   3. Crack Resistance: No failure at 1/16 inch gap, minimum.
   4. Products:
      a. LATICRETE International, Inc; LATICRETE Blue 92 Anti-Fracture Membrane: www.laticrete.com.
      b. MAPEI Corporation; Mapelestic CI: www.mapei.com.
      c. Substitutions: See Section 01 6000 - Product Requirements.

C. Membrane at pre-cast tread installation over steel plate.
   1. Type: Light weight peel and stick membrane.
   2. Material: Polymer modified asphaltic adhesive coated on a 100 percent non-woven polyester.
   3. Thickness: 40 mils.
   4. Primer: Use manufacturer suggested primer for suitable substrate.
   5. Product: Fracture Ban by LATICRETE International, Inc; www.laticrete.com.

D. Waterproofing Membrane at Floors and Shower/Kitchen Walls: Specifically designed for bonding to cementitious substrate under thick mortar bed or thin-set tile; complying with ANSI A118.10.
   1. Type: Fluid-applied.
   2. Material: SBS rubber.
   3. Reinforcing: Polyester fabric reinforcing at edges, corners, joints, and cracks.
   4. Products:
      a. Mapei Corporation; Mapelastic AquaDefense: www.mapei.com.
      b. Custom Building Products: Redgard: www.custombuildingproducts.com.
      c. Substitutions: See Section 01 6000 - Product Requirements.

E. Tile Sealant: Gunnable, silicone, siliconized acrylic, or urethane sealant; moisture and mildew resistant type.
   1. Applications: Tile joints as detailed on drawings.
   2. Color(s): As selected by Architect from manufacturer's full line.
   3. Products:
      a. ARDEX Engineered Cements; ARDEX Flex Caulk: www.ardexamericas.com.
      b. Custom Building Products; Commercial 100% Silicone Caulk: www.custombuildingproducts.com.
      c. LATICRETE International, Inc; LATICRETE Latasil: www.laticrete.com.
      d. Substitutions: See Section 01 6000 - Product Requirements.

F. Grout Sealer: Premium, no-sheen, water-based, penetrating sealer to provide stain protection, complies with: Excellent stain resistance to most household contaminants (CTI-072).
   1. Acceptable Products:
      a. Aqua Mix Sealer's Choice Gold by Custom.

G. Perimeter Joint Material: Caulked Joint will be acceptable as per ANSI and TCNA Standards.

H. Control Joint Material: Profile with integrated rigid, recycled PVC, trapezoid-perforated anchoring legs, connected by a 3/8 inch (10 mm) wide soft CPE movement zone that forms the visible surface. Color as selected by Architect. Height as required.
   1. Product: DILEX-BWB manufactured by Schluter Systems (www.schluter.com) or equal.

2. Spacing and location as recommended by Tile Manufacturer and approved by Architect.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that recessed floors with drains have required slope to drain.
   1. Report any non comforming recessed floors to Architect / General Contractor.
B. Verify that subfloor surfaces are smooth and flat within the tolerances specified for that type of work and are ready to receive tile.
C. Verify that wall surfaces are smooth and flat within the tolerances specified for that type of work, are dust-free, and are ready to receive tile.
D. Verify that subfloor surfaces are dust free and free of substances that could impair bonding of setting materials to subfloor surfaces.
E. Cementitious Subfloor Surfaces: Verify that substrates are ready for tiling installation by testing for moisture and alkalinity (pH).
   1. Test as Follows:
      a. Alkalinity (pH): ASTM F710.
      b. Internal Relative Humidity: ASTM F2170.
      c. Moisture Vapor Emission: ASTM F1869.
   2. Obtain instructions if test results are not within limits recommended by tiling material manufacturer and setting material manufacturer.
   3. Follow moisture and alkalinity remediation procedures in Section 09 0561.
F. 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. Prepare substrate surfaces for adhesive installation in accordance with adhesive manufacturer's instructions.

3.03 INSTALLATION - GENERAL

A. Install movement joints in accordance with requirements of TCNA EJ171 Guidelines and manufacturer's instructions.
   1. Keep movement/expansion/control joints free of adhesive or grout. Apply sealants to joints.
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. Install non-ceramic trim in accordance with manufacturer's instructions.
G. Sound tile after setting. Replace hollow sounding units.
H. Keep control and expansion joints free of mortar, grout, and adhesive.
   1. Apply sealants to joints.
I. Prior to grouting, allow installation to completely cure; minimum of 48 hours.
J. Grout tile joints unless otherwise indicated. Use standard grout unless otherwise indicated., refer to grout specifications for use and locations.

K. At changes in plane and tile-to-tile control joints, use tile sealant instead of grout, with either bond breaker tape or backer rod as appropriate to prevent three-sided bonding.
   1. Keep joints free of mortar, grout, and adhesive.

L. Apply sealant to junction of tile and dissimilar materials.

3.04 INSTALLATION - FLOORS - THIN-SET METHODS

A. Over interior concrete substrates, on-ground and above-ground.
   1. Install in accordance with the Tile council of North America Handbook TCNA (HB), Method F113A.
   2. On-ground application, install crack isolation membrane as needed over existing cracks. In accordance with ANSI A118.12.
   3. Above ground application, install crack isolation membrane over entire floor. In accordance with ANSI A118.12.

3.05 INSTALLATION - FLOORS - MORTAR BED METHODS

A. Over interior concrete substrates, on-ground.
   1. Install in accordance with The Tile Council of North America Handbook TCNA (HB) Method F112 (**Bonded Mortar Bed** with waterproof membrane applied on top of mortar bed).

B. Waterproofing Membrane: Install as recommended by manufacturer.

C. Mortar Bed Thickness: 1-inch (25 mm) minimum to 2 inches (51 mm) maximum.

3.06 INSTALLATION - WALL TILE (THIN-SET)

A. Over coated glass mat backer board on studs.
   1. Bed self-adhesive 2 inch wide fiberglass mesh tape in bead of flexible sealant. Then, embed the tape with same material used to set tiles. Pull tile setting materials tightly over joint to reduce crown in joint area. Allow tile setting material to dry prior to setting tile.
   2. Install in accordance with The Tile Council of North America Handbook Method TCNA (HB) W245 Thin-Set.

B. Over interior masonry install in accordance with The tile Council of North America Handbook Method W202I (Thin-Set, waterproof membrance at shower and kitchen locations).

3.07 INSTALLATION - PRE-CAST CONCRETE STAIR TREADS

A. Anti-Fracture Membrane: Prime and install anti-fracture membrane on stair substrate per manufacturer's recommendations.

B. Pre-cast concrete:
   1. Install using latex-portland cement mortar applied in a full bed method.
   2. Set treads level and plumb to meet finished nosing layout marks.
   3. Tool front mortar joint smooth and uniform.
   4. Seal joints as directed by Architect only.

3.08 INSTALLATION - TILE OVER METAL STAIRS

A. Anti-Fracture Membrane: Prime and install anti-fracture membrane on stair substrate per manufacturer's recommendations.

B. Install tile per paragraph 3.06 above.

3.09 CLEANING AND SEALING

A. Clean tile and grout surfaces.

B. Seal all wall, ceiling, and floor grout conditions along with all floor tile per manufacturer's recommended application rates and procedures.

3.10 PROTECTION

A. Do not permit traffic over finished floor surface for 4 days after installation.

END OF SECTION 09 3000

This page intentionally left blank

SECTION 09 5100

SUSPENDED ACOUSTICAL CEILINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Furnish all labor, materials, equipment, tools and services required to fully complete all Suspended Acoustical Ceiling work as is indicated on the drawings and/or specified herein including, but not limited to, the following described items.
B. Suspended metal grid ceiling system.
C. Acoustical lay-in panels.
D. Accessories.
E. Supplementary acoustical insulation above ceiling.
F. Do not include sales tax, refer to Section 00 1115 - Advertisement for Prequalification of Bidders.

1.02 RELATED REQUIREMENTS

A. Section 07 2100 - Building Insulation: Acoustical insulation.
B. Section 08 3100 - Access Doors and Panels: Access panels.
C. Division 21 - Fire Suppression Sprinkler Systems: Sprinkler heads in ceiling system.
D. Division 23 - Air Outlets and Inlets: Air diffusion devices in ceiling.
E. Division 26 - Interior Lighting: Light fixtures in ceiling system.
F. Division 27 - Public Address Systems: Speakers in ceiling system.
G. Division 28 - Fire Detection and Alarm: Fire alarm components in ceiling system.

1.03 REFERENCE STANDARDS

A. ASCE 7 - Minimum Design Loads and Associated Criteria for Buildings and Other Structures; Most Recent Edition Cited by Referring Code or Reference Standard.
B. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2020.
C. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2015.
D. ASTM B209/B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2021a.
E. ASTM C635/C635M - Standard Specification for the Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings; 2017.
F. ASTM C636/C636M - Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels; 2013.
G. ASTM C665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing; 2017.
H. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials; 2020.
I. ASTM E580/E580M - Standard Practice for Installation of Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels in Areas Subject to Earthquake Ground Motions; 2022.
J. CISCA (AC) - Acoustical Ceilings: Use and Practice; 1999.
K. ICC (IBC) - International Building Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
L. UL (FRD) - Fire Resistance Directory; Current Edition.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Sequence work to ensure acoustical ceilings are not installed until building is enclosed, sufficient heat is provided, dust generating activities have terminated, and overhead work is completed, tested, and approved.
B. Do not install acoustical units until after interior wet work is dry.

1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.
B. Shop Drawings: Indicate grid layout and related dimensioning, junctions with other ceiling finishes, and mechanical and electrical items installed in the ceiling.
C. Product Data: Provide data on suspension system components and acoustical units.
D. Samples: Submit two samples 12 inch by 12 inch in size illustrating material and finish of acoustical units.
E. Samples: Submit two samples each, ____ inches long, of suspension system main runner, cross runner, and perimeter molding.
F. Manufacturer's Installation Instructions: Indicate special procedures and perimeter conditions requiring special attention.
G. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
    1. See Section 01 6000 - Product Requirements, for additional provisions.
    2. Extra Acoustical Units: 2 unopened cartons of each type of acoustical ceiling panel.

1.06 QUALITY ASSURANCE

A. Designer Qualifications for Seismic Design: Perform under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed at the State in which the Project is located.
B. Suspension System Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.
C. Acoustical Unit Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

1.07 FIELD CONDITIONS

A. Maintain uniform temperature of minimum 60 degrees F, and maximum humidity of 40 percent prior to, during, and after acoustical unit installation.

1.08 GUARANTEE

A. The Contractor shall guarantee his work for a period of One (1) year from date of Substantial Completion. Guarantee shall be on form included in Section 01 7800.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Acoustic Tiles/Panels:
    1. Armstrong World Industries, Inc: www.armstrong.com.
    2. Rockfon, LLC: www.rockfon.com.
    3. CertainTeed Corporation: www.certainteed.com.
    4. USG: www.usg.com.
B. Suspension Systems:
    1. Same as for acoustical units.

2.02 PERFORMANCE REQUIREMENTS

A. Fire-Resistance Rating: Determined in accordance with test procedures in ASTM E119 and complying with the following:
B. Seismic Performance: Ceiling systems designed to withstand the effects of earthquake motions determined according to ASCE 7 for Seismic Design Category D, E, or F and complying with the following:

2.03 ACOUSTICAL UNITS

A. Acoustical Tile Type A: Mineral Fiber, ASTM E1264 Type A, Form A1.2, Pattern D, with the following characteristics:
   1. Size: 24 inches by 48 inches.
   2. Thickness: 3/4 inches.
   3. Light Reflectance: 83 to 85 percent, determined in accordance with ASTM E1264.
   4. NRC: 0.70, determined as specified in ASTM E1264.
   5. Ceiling Attenuation Class (CAC): 35 to 40, determined in accordance with ASTM E1264.
   6. Edge: Square.
   7. Surface Color: White.
   8. Suspension System: Exposed grid Type 1.
   9. Products:
      a. 22541 Radar Education by USG.
      b. HHF-497 HNRC Fine Fissured High NRC by CertainTeed.
      c. 1714 School Zone Fine Fissured by Armstrong.
B. Acoustical Tile Type B: Mineral Fiber, ASTM E1264 Type A, Form A1.2, Pattern D; Fire Class A, with the following characteristics:
   1. Size: 24 inches by 48 inches or 24 inches by 24 inches as indicated on the drawings.
   2. Thickness: 5/8 inches.
   3. Light Reflectance: 85 percent, determined in accordance with ASTM E1264.
   4. NRC: 0.55, determined as specified in ASTM E1264.
   5. Ceiling Attenuation Class (CAC): 35, determined in accordance with ASTM E1264.
   6. Edge: Square.
   7. Surface Color: White.
   8. Suspension System: Exposed grid Type 1.
   9. Basis of Design: Fine Fissured by Armstrong.
C. Ceiling Tile Type C: Vinyl-Faced Gypsum, ASTM E1264 Type XX, Pattern G with the following characteristics:
   1. Size: 24 inches by 48 inches (600 mm by 1200 mm).
   2. Thickness: 1/2 inch.
   3. Light Reflectance: 0.77 percent, determined as specified in ASTM E1264.
   4. Ceiling Attenuation Class (CAC): 40, determined as specified in ASTM E1264.
   5. Edge: Square.
   6. Surface Color: White.
   7. Panel Features: Washable, scrubbable, soil and impact resistant finish. Meets USDA/FSIS guidelines for use in food processing areas.
   8. Suspension System: Exposed grid Type 1.
   9. Products:
      a. 3270 Sheetrock Lay-In ClimaPlus by USG.
      b. 1140-CRF-1 Vinylrock by CertainTeed.
      c. 7771.01V Endure by Chicago Metallic.
D. Acoustical Tile Type D: Fiberglass, ASTM E1264 Type B, Form B2, Pattern E; Fire Class A, with the following characteristics:

1. Size: 48 inches by 48 inches.
2. Thickness: 1 inch.
3. Light Reflectance: 90 percent, determined in accordance with ASTM E1264.
4. NRC: 1, determined as specified in ASTM E1264.
5. Ceiling Attenuation Class (CAC): 26, determined in accordance with ASTM E1264.
6. Edge: Square.
7. Surface Color: White.
8. Suspension System: Exposed grid Type 1.
9. Basis of Design: Optima by Armstrong.

2.04 SUSPENSION SYSTEM(S)

A. Metal Suspension Systems - General: Complying with ASTM C635/C635M; die cut and interlocking components, with perimeter moldings, hold down clips, stabilizer bars, clips, and splices as required.
   1. Materials:
      a. Steel Grid: ASTM A653/A653M, G30 coating, unless otherwise indicated.
      b. Aluminum Grid: Aluminum sheet, ASTM B209/B209M.
      c. Stainless Steel Grid: ASTM A666, Type 304.

B. Exposed Steel Suspension System -Type 1: Formed steel, commercial quality cold rolled; heavy-duty and non-rated.
   1. Construction: Double web.
   2. Finish: White painted.
   3. Product: Donn Fineline DXF manufactured by USG.
   4. Product: Smoothline Bolt Slot System manufactured by CertainTeed.
   5. Product: Silhouette XL manufactured by Armstrong.
   6. Substitutions: See Section 01 6000 - Product Requirements.

C. Exposed Steel Suspension System -Type 2: Formed steel, commercial quality cold rolled; heavy-duty and non-rated.
   1. Profile: Tee; 9/16 inch wide face.
   2. Profile: Box with 1/4 inch reveal; 9/16 inch (14 mm) wide face.
   3. Construction: Double web.
   4. Finish: White painted.
   5. Product: Donn Fineline DXF manufactured by USG.
   6. Product: Smoothline Bolt Slot System manufactured by CertainTeed.
   7. Product: Silhouette XL manufactured by Armstrong.
   8. Substitutions: See Section 01 6000 - Product Requirements.

2.05 ACCESSORIES

A. Support Channels and Hangers: Galvanized steel; size and type to suit application, seismic requirements, and ceiling system flatness requirement specified.

B. Hanger Wire: 12 gauge, 0.08 inch galvanized steel wire.

C. Hold-Down Clips: Manufacturer's standard clips to suit application.

D. Seismic Clips: Manufacturer's standard clips for seismic conditions and to suit application.

E. Perimeter Moldings: Same metal and finish as grid.
   1. Size: As required for installation conditions and specified Seismic Design Category.
   2. Angle Molding: L-shaped, for mounting at same elevation as face of grid.
   3. Shadow Molding: Shaped to create a perimeter reveal.
   4. Channel Molding: U-shaped, for hold-down type installations.
   5. Gaskets For Perimeter Moldings: Closed-cell foam, factory-applied to molding.
   6. Acoustical Sealant For Perimeter Moldings: Non-hardening, non-skinning, for use in conjunction with suspended ceiling system.

7. At Concealed Grid: provide exposed L-shaped molding.
8. At Clouds: 3/4 inch wide by 2 inches tall.

F. Metal Edge Trim for "Cloud" Suspension Systems: Extruded aluminum; provide attachment clips, splice plates, and preformed corner pieces for complete trim system.
1. Trim Height: 4 inch.
2. Finish: Baked enamel.
3. Color: White.
4. Basis of Design Product: AXIOM Classic Straight Perimeter Trim by Armstrong.

G. Expansion Joint: Joints meeting code requirements for area limitations and project area seismic zone.
1. SJCG or SJCSI Seismic Joint Clip by Armstrong
2. Substitutions: See Section 01 6000 - Product Requirements.

H. Acoustical Insulation: Specified in Section 07 2100.
1. Size: To fit acoustical suspension system.

I. Gypsum Board: Fire rated type; 5/8 inch thick, ends and edges square, paper faced.

J. Touch-up Paint: Type and color to match acoustical and grid units.

K. Suspension and Lateral Bracing Wire: #12 gauge SWG galvanized steel wire.

L. Escutcheon Ring for Pipe Penetrations: 2 inch (50 mm) escutcheon ring with built-in hole cutter.
1. Color: White.
2. Manufacturers:
a. Premier Mounts; Product - "HCER": www.premiermounts.com.

M. Steel Stud System (vertical seismic struts):
1. Shall be type, gauge, and size as shown on drawings.
2. Manufacturers:
a. Dietrich Metal Framing: www.dietrichindustries.com.
b. Cemco Steel: www.cemcosteel.com.
c. Scafco Corporation: www.scafco.com.
d. The Steel Network Inc: www.SteelNetwork.com.
e. Telling Industries: www.tellingindustries.com.
f. Substitutions: See Section 01 6000 - Product Requirements.

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 PREPARATION

A. Install after major above-ceiling work is complete.

B. Coordinate the location of hangers with other work.

3.03 INSTALLATION - SUSPENSION SYSTEM

A. Install suspension system in accordance with ASTM C 636/C 636M, ASTM E 580/E 580M, ASTM C 636/C 636M, ASTM E 580/E 580M, ASTM C 636/C 636M, and ASTM E 580/E 580M and as supplemented in this section.
1. Hangar wires shall be supported from overhead construction. Spacing of wires for all suspended grid system ceilings shall not exceed 4 feet o.c. each way. Splayed hangers may be provided. Hanger wires shall be installed with a minimum of 3 turns around itself, both top and bottom. Hanging wires greater than 15 degrees out of plumb shall be splayed by bracing, counter-splaying or trapeze supports.

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, avoid tiles less than 6 inches when cut.
D. Perimeter Molding: Install at intersection of ceiling and vertical surfaces and at junctions with other interruptions.
    1. Use longest practical lengths.
E. Suspension System, Non-Seismic: Hang suspension system independent of walls, columns, ducts, pipes and conduit. Where carrying members are spliced, avoid visible displacement of face plane of adjacent members.
    1. Additional lateral force support bracing wires as required for ceiling system, light fixtures, partition head loads, mechanical air terminals, etc., shall comply to ICC (IBC) and the latest CISCA (AC). In case of conflict, adhere to most stringent requirements as accepted by the Architect and without extra cost to the Owner.
F. Seismic Suspension System, Seismic Design Categories D, E, F: Hang suspension system with grid ends attached to the perimeter molding on two adjacent walls; on opposite walls, maintain a 3/4 inch clearance between grid ends and wall.
G. Where ducts or other equipment prevent the regular spacing of hangers, reinforce the nearest affected hangers and related carrying channels to span the extra distance.
H. Do not support components on main runners or cross runners if weight causes total dead load to exceed deflection capability.
I. Support fixture loads using supplementary hangers located within 6 inches of each corner, or support components independently.
J. Do not eccentrically load system or induce rotation of runners.
K. Form expansion joints as detailed on drawings or as directed by Architect. Form to accommodate plus or minus 1 inch movement. Maintain visual closure.
L. Install light fixture boxes constructed of gypsum board above light fixtures in accordance with fire rated assembly requirements and light fixture ventilation requirements.

3.04 INSTALLATION - ACOUSTICAL UNITS

A. Install acoustical units in accordance with manufacturer's instructions.
B. Fit acoustical units in place, free from damaged edges or other defects detrimental to appearance and function.
C. Lay directional patterned units with pattern parallel to longest room axis.
D. Fit border trim neatly against abutting surfaces.
E. Install acoustical units level, in uniform plane, and free from twist, warp, and dents.
F. Cutting Acoustical Units:
    1. Cut to fit irregular grid and perimeter edge trim.
    2. Make field cut edges of same profile as factory edges.
    3. Double cut and field paint exposed reveal edges.
G. Where round obstructions and bullnose concrete block corners occur, provide preformed closures to match perimeter molding.
H. Lay acoustical insulation for a distance of 48 inches either side of acoustical partitions as indicated.
I. Install hold-down clips on each panel to retain panels tight to grid system; comply with fire rating requirements.
J. Install hold-down clips on panels within 20 ft of an exterior door.

3.05 TOLERANCES

A. Maximum Variation from Flat and Level Surface: 1/8 inch in 10 feet.
B. Maximum Variation from Plumb of Grid Members Caused by Eccentric Loads: 2 degrees.

3.06 SCHEDULE - REFER TO DRAWINGS

END OF SECTION 09 5100

This page intentionally left blank

SECTION 09 5153

DIRECT-APPLIED ACOUSTICAL CEILINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Furnish all labor, materials, equipment, tools and services required to fully complete all Direct-Applied Acoustical Ceiling work as is indicated on the drawings and/or specified herein including, but not limited to, the following described items.
B. Acoustic units.
C. Perimeter trim.
D. Do not include sales tax, refer to Section 00 1115 - Advertisement for Prequalification of Bidders.

1.02 RELATED REQUIREMENTS

A. Section 09 2116 - Gypsum Board Assemblies: Supporting substrate
B. Section 09 5100 - Acoustical Ceilings.

1.03 REFERENCE STANDARDS

A. ASTM E1264 - Standard Classification for Acoustical Ceiling Products; 2019.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Sequence work to ensure acoustic ceilings are not installed until building is enclosed, sufficient heat is provided, dust generating activities have terminated, and overhead work is completed, tested, and approved.
B. Install acoustic units after interior wet work is dry.

1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide data on acoustic units, perimeter trimand adhesive.
C. Shop Drawings: Indicate tile layout and related junctions with other work or ceiling finishes, interrelation of mechanical and electrical items related to system.
D. Samples: Submit two samples, 12 by 12 inch in size, illustrating material and finish of acoustic units.
E. Samples: Submit two samples, 6 inch (150 mm) in length, illustrating material and finish of perimeter trim.
F. Manufacturer's Installation Instructions: Indicate special procedures and perimeter conditions requiring special attention.
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 Acoustical Units: 2 unopened cartons of each type.

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 the type of work specified in this section with minimum 3 years of documented experience.

1.07 FIELD CONDITIONS

A. Maintain uniform temperature of minimum 60 degrees F, and maximum humidity of 40 percent prior to, during, and after installation.

1.08 GUARANTEE

A. The Contractor shall guarantee his work for a period of One (1) year from date of Substantial Completion. Guarantee shall be on form included in Section 01 7800.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Acoustic Tile:
   1. Armstrong World Industries, Inc: www.armstrong.com.
   2. CertainTeed Corporation: www.certainteed.com.
   3. USG: www.usg.com.
   4. Rockfon, LLC: www.rockfon.com.
   5. Substitutions: See Section 01 6000 - Product Requirements.

2.02 MATERIALS

A. Acoustic Tile: ASTM E1264 Type III or Type XX, Conforming to the following:
   1. Size: 12 by 12 inches.
   2. Thickness: 3/4 inches.
   3. Light Reflectance: 0.86, determined as specified in ASTM E1264.
   4. NRC: 0.60, determined as specified in ASTM E1264.
   5. Ceiling Attenuation Class (CAC): 0.40, determined as specified in ASTM E1264.
   6. Joint: Kerfed.
   7. Edge: Square.
   8. Surface Color: White.
   9. Surface Finish: Fine-textured.
B. Adhesive: Waterproof, type recommended by tile manufacturer.
C. Perimeter Moldings: Rolled steel profile, white color.
   1. Slip-on Wall Moulding 7843 manufactured by Armstrong.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions and substrate flatness before starting work.
B. Verify that substrate conditions are ready to receive the work of this section.

3.02 INSTALLATION

A. Install system in accordance with manufacturer's instructions.
B. Perimeter Molding:
   1. Use longest practical lengths.
   2. Miter corners.
C. Locate tile on room axis according to reflected plan.
D. Fit acoustic units in place, free from damaged edges or other defects detrimental to appearance and function.
E. Install acoustic units level in uniform plane.
F. Remove loose dust from back of tile and ceiling where adhesive is to be applied.
G. Prime 3 inch (75 mm) minimum circle near each corner by buttering very thin coat of adhesive.

H. Apply daub of adhesive to each corner. Daubs will be of sufficient size to form a circle 2 1/2 to 3 inches (63 to 75 mm) in diameter and 1/8 to 1/4 inch (3 to 6 mm) thick when tile is pressed firmly in place. Do not apply daubs so far in advance of installation that adhesive skins over.

I. Level tile by inserting a 1/16 inch (2 mm) thick by 3 inches (75 mm) long fiber spline at each corner (works out to one spline for every tile), use a 48 to 72 inch (1219 to 1829 mm) straight edge and press to the face of the installed tile.

J. Install perimeter molding wherever tile has exposed edges or abuts walls, columns, and other vertical surfaces.

K. Locate light fixtures, mechanical diffusers and grilles symmetrically in room and centered on tile centers or tile joints insofar as possible, unless shown otherwise.

3.03 TOLERANCES

A. Maximum Variation from Flat and Level Surface: 1/8 inch in 10 feet.

3.04 SCHEDULES - REFER TO DRAWINGS

END OF SECTION 09 5153

This page intentionally left blank

SECTION 09 6413

WOOD FLOORING - STAGE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Furnish all labor, materials, equipment, tools and services required to fully complete all Wood Flooring work as is indicated on the drawings or specified herein including, but not limited to, the following described items.
B. Hardwood strip flooring system located at Stage Forward.
   1. Hardwood trim.
C. Plywood flooring system located at Stage, Back.
D. Sheet vapor barrier.
E. Surface finishing.
F. Rubber vent cove base at wall where scheduled.
G. Aluminum threshold floor plates.
H. Do not include sales tax, refer to Section 00 0102 - Notice to Contractors.

1.02 RELATED REQUIREMENTS

A. Section 03 3000 - Cast-In-Place Concrete: Recessed concrete subfloor surface and formed depressions for deep floor sockets and inserts.
B. Section 09 0561 - Common Work Results for Flooring Preparation: Independent agency testing of concrete slabs, cleaning, and preparation.
C. Division 26 - Electrical: Coordination of cut openings for required electrical outlets.

1.03 REFERENCES

A. ASTM D3575 - Standard Test Methods for Flexible Cellular Materials Made From Olefin Polymers; 2008.
B. MFMA (SPEC) - Guide Specifications for Maple Flooring Systems; Maple Flooring Manufacturers Association; current edition.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide data for flooring and floor finish materials.
C. Shop Drawings: Indicate floor joint pattern and termination details.
   1. Indicate provisions for expansion and contraction and base.
D. Samples: Submit two samples 12 inch by 12 inch in size illustrating floor finish, color, and sheen.
E. Certification: Suppliers shall submit certificates attesting that materials furnished will meet specifications for grade, quality, dryness and treatment, if required.
F. Installation Instructions: Indicate standard and special installation procedures and perimeter conditions requiring special attention.
G. Maintenance Data: Include maintenance procedures, recommended maintenance materials, and a suggested schedule for cleaning.
H. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 01 6000 - Product Requirements, for additional provisions.
   2. Extra Flooring Material: 10 square yards matching installed flooring.

1.05 QUALITY ASSURANCE

A. Perform work of this section in accordance with MFMA (SPEC).
   1. Maintain one copy of document on site.
B. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with minimum five years documented experience.
C. Installer Qualifications: Company specializing in performing work of this section with minimum five years experience and approved by manufacturer.

1.06 FIELD CONDITIONS, DELIVERY, STORAGE AND HANDLING

A. Materials shall not be delivered, stored or installed until all masonry and painting work is complete, and all overhead mechanical work, lighting, backstops, scoreboards are installed. Room temperature of 55-80 degrees Fahrenheit (13 to 27 degrees Celsius) and relative humidity of 35-50 percent are to be maintained. Ideal installation/storage conditions are the same as those that will prevail when building is occupied.
B. Materials shall not be stored at the installation location if the moisture content of the concrete slab exceeds 4 percent or vapor transmission exceeds 4.5 pounds per 1,000 square feet (2.20 kg per 100 square meters).
C. Do not install floor system until concrete has been cured 60 days and the requirements above have been obtained.
D. General Contractor is responsible to ensure slab is clean and free of all dirt and debris prior to floor installation beginning.
E. Permanent heat, light and ventilation shall be installed and operating during and after installation. Maintain a temperature range of 55 to 80 degrees Fahrenheit (13 to 27 degrees Celsius) and a relative humidity range of 35 to 50 percent. Consult MFMA guidelines for further information.
F. After floors are finished, area to be kept locked by General Contractor to allow curing time for the finish. If after required curing time General Contractor or Owner requires use of area, he shall protect the floor by covering with non-fibered kraft paper or red rosin paper with taped joints, until acceptance by Owner (or Owner’s agent) of complete floor system.
G. Manufacturer and or flooring contractor's advertising in the form of a logo or otherwise shall not be displayed.

1.07 GUARANTEE

A. The Contractor shall guarantee his work for a period of 5 years from date of Substantial Completion. Guarantee shall be on form included in Section 01 7800.

PART 2 PRODUCTS

2.01 HARDWOOD FLOORING

A. Materials:
   1. Vapor Barrier: 6-mil carbonized polyethylene.
   2. Blanket Seal Underlayment: 1/2 inch (13 mm) by 48 inch (1219 mm) multi-cellular, closed cell, flexible polyethylene plastic foam having a skin free of surface and reasonably smooth. ASTM D3575-84, test "W" method B density PCF 2.5 (ethafoam 222 Volara Type A or equal).
   3. Subfloor: 3/4 inch (19 mm) by 48 inch (1219) by 96 inch (2438 mm) Group 2 INT-EXT DFPA C-D underlayment. Plywood to be installed at a diagonal to the blanket seal in an ashlar pattern.

4. Flooring: 2 1/4 inch (57 mm) wide by 25/32 inch (20 mm) thick, Northern Hard Maple, First Grade, tongue and groove and end matched; graded to exceed MFMA-FJ grade rules.

B. Finishing Materials:
   1. Floor-Finish System: System of compatible components recommended in writing by flooring manufacturer, and MFMA approved.
      a. Note that the specified finishes must be waterborne products to meet State of Utah requirements.
      b. Approved Manufacturers:
         1) BonaKemi USA, Inc.
         2) PoloPlaz.
         3) Federal Finish.
      c. Floor-Sealer Formulation: Pliable, penetrating type. MFMA Group 1, Sealers.
      d. Application: Two (2) coats.
      e. Finish-Coat Formulation: Formulated for satin finish indicated and multi-coat application.
         1) Application: Three (3) coats.

2.02 PLYWOOD FLOORING

A. Materials:
   1. Vapor Barrier: 6 mil carbonized polyethylene.
   2. Blanket Seal Underlayment: Multi-cellular, closed cell, flexible polyethylene plastic foam having a skin free of surface and reasonably smooth.
      a. Size: 48 inch by 96 inch (1220 mm by 2440 mm).
      b. Thickness: 1/2 inch (13 mm).
   3. Plywood Subfloor: Group 2 INT-EXT DFPA C-D underlayment. Installed at a diagonal to the blanket seal in an ashlar pattern.
      a. Size: 48 inch by 96 inch (1220 mm by 2440 mm).
      b. Thickness: 3/4 inch (19 mm).
   4. Hardboard face layer laminated on Douglas Fir/Hemlock plywood panels
      a. Size: 48 inch by 96 inch (1220 mm by 2440 mm).
      b. Thickness: 3/4 inch (18 mm).
      c. Basis of Design: Tempered Plyron Industrial Panels by Olympic Panel Products, www.olypanel.com.

B. Finish:
   1. Rosco Tough Prime.
   2. Color: #06055 “Tough Prime Black”.
   3. Egg-shell finish.
   4. Apply three (3) coats.

2.03 ACCESSORIES

A. Solid Blocking at all transitions.
B. Ventilating Base: Molded rubber, 3 inch high with a 4 inch (100 mm) toe, ventilating type, with adhesives and accessories, black.
C. Divider and Edge Strip: Angle mill finish aluminum.
D. Transition Strip: Same species and finish as flooring material.
E. Metal thresholds: 1/8 inch thick by 1/4 inch high by width required. 413 through 1013 by NGP or equal.

2.04 SOURCE QUALITY CONTROL

A. Inspect and stamp species and grade on underside of each piece of wood flooring at factory.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.
B. Cementitious Sub-floor Surfaces: Verify that substrates are dry enough and ready for resilient flooring installation by testing for moisture and pH.
   1. Test in accordance with Section 09 0561.
   2. Obtain instructions if test results are not within limits recommended by wood flooring manufacturer.
C. Verify that concrete subfloor surface is smooth and flat to plus or minus 1/8 inch in 10 feet.
D. Verify wood subfloor is properly secured, smooth and flat to plus or minus 1/4 inch in 10 feet.
E. Verify that required floor-mounted utilities are in correct location.

3.02 HARDWOOD FLOOR INSTALLATION

A. Place vapor barrier over subfloor surface, lapping edges and ends minimum 6 inches (150 mm) and tape seal; spot glue in place.
B. Loose lay blanket seal underlayment over vapor barrier.
C. Install subfloor at a diagonal to the blanket seal underlayment in an ashlar pattern.
D. Provide 2 inch (50 mm) expansion void at perimeter and at all vertical obstructions (except where shown otherwise on drawings).
E. Install hardwood/softwood flooring as per manufacturer's recommendations.
F. Sanding:
   1. Sand flooring per manufacturer's recommendations.
   2. Vacuum or tack floor before first coat of finish.
   3. Floor shall present a smooth surface without drum stop marks, gouges, streaks or shiners.
G. Finishing:
   1. Mask off adjacent surfaces before beginning sanding.
   2. Sand flooring to smooth even finish with no evidence of sander marks. Take precautions to contain dust. Remove dust by vacuum.
   3. Apply finish in accordance with floor finish manufacturer's instructions.
   4. Apply filler and stain.
H. Install base at floor perimeter to cover expansion space in accordance with manufacturer's instructions. Use pre-molded outside corners and neatly mitered inside corners.
I. Install thresholds and transition strips.

3.03 PLYWOOD FLOORING INSTALLATION

A. After inspection and acceptance of substrate, carefully sweep and vacuum up all dust and grit.
B. Install vapor barrier over slab, lapping edges and ends minimum 6 inches (150 mm) and tape seal.
C. Loose lay blanket seal underlayment over vapor barrier.
D. Install plywood subfloor at a diagonal to the blanket seal in an ashlar pattern.
E. Allow 1 inch (25 mm) expansion void around entire perimeter (except where shown otherwise on drawings).
F. Install finish plywood flooring using countersunk wood screws at four corners and 24 inches (610 mm) o.c. each way at field.
G. Provide thresholds where indicated.

H. Install base at floor perimeter to cover expansion space in accordance with manufacturer's instructions. Miter inside and outside corners.

I. Finishing:
   1. Vacuum or tack floor before first coat of finish.
   2. Apply finish in accordance with floor finish manufacturer's instructions.

3.04 CLEANING

A. Clean and polish floor surfaces in accordance with manufacturer's instructions.

3.05 PROTECTION

A. Prohibit traffic on floor finish for 48 hours after installation.

B. Place protective coverings over finished floors; do not remove coverings until Substantial Completion.

END OF SECTION 09 6413

This page intentionally left blank

SECTION 09 6466

WOOD ATHLETIC FLOORING

PART 1 GENERAL

1.01 SUMMARY

A. Furnish all labor, materials, equipment, tools and services required to fully complete all Wood Athletic Flooring work as is indicated on the drawings or specified herein including, but not limited to, the following described items.
   1. Wood Athletic Flooring for:
      a. Main Gymnasium, Auxiliary Gymnasium.
         1) ProAction Thrust.
      b. Dance Studio:
         1) ProAction Thrust LP.
   2. All Game-line, Marker, Lettering, Stain and Paint for Wood Athletic Flooring, as shown on drawings.
   3. Do not include sales tax, refer to Section 00 0104 - Notice to Contractors.

1.02 RELATED SECTIONS

A. Section 03 3000 - Cast-In-Place Concrete.
   1. The General Contractor shall provide a level slab, steel troweled to a tolerance of 1/8" (3 mm) in a 10'-0" (3 m) radius and subject to the approval of the Wood Floor Contractor. Moisture barriers must be adequate for conditions. MFMA does not acknowledge the use of FF/FL numbers to measure levelness/flatness tolerances in gymnasium concrete slabs. Concrete shall not use river gravel or pea gravel and have an average of compressive strength of - refer to structural notes. Concrete must be cured for 60 days before installation can begin. (Verify with manufacturer's recommendations for depression of slab).
      a. Main Gymnasium: Concrete slab to be depressed 2-1/2" (64 mm) for 25/32" (20 mm) flooring.
      b. Auxiliary Gymnasium: Concrete slab to be depressed 2-1/2" (64 mm) or 25/32" flooring (20 mm).
      c. Dance Studio The concrete slab shall be depressed 2-1/4" (57 mm) for 25/32" (20 mm) flooring.
B. Section 03 3000 - Underslab Vapor Retarder, for waterproofing under concrete slabs
C. Section 09 6500 - Resilient Tile Flooring, for coordination between wood athletic flooring and resilient tile flooring.

1.03 SUBMITTALS

A. Product Data: Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for wood sports-floor assemblies.
B. Shop Drawings: Show installation details including location and layout of each type of floor assembly and accessory. Include the following:
   1. Expansion provisions and trim details.
   2. Layout, colors, widths, and dimensions of game lines and markers, and school logo.
   3. Locations of floor inserts for athletic equipment installed through flooring assembly.
C. Samples for Initial Selection. Manufacturer’s color charts showing colors and glosses available for the following:
   1. Floor finish.

2. Game-line lettering, marker and logo paint.

D. Samples for Verification: For each type of sport-floor assembly and accessory required; approximately 12 inches (300 mm) long and of same thickness and material indicated for the Work.
   1. Include sample sets showing the full range of normal color and texture variations expected in wood flooring.

E. Maintenance Data: For wood sports-floor assemblies and finish systems to include in maintenance manuals.

1.04 QUALITY ASSURANCE

A. All system component parts must be supplied by flooring manufacturer.
B. The Flooring Contractor must be approved by flooring manufacturer.
C. The school district will require a certificate from the manufacturer verifying that the floor is certified before project is awarded. Installers must be certified from the manufacturer that they can properly install the floor.
D. Flooring materials must be allowed to acclimate to building conditions on the jobsite in a dry, well-ventilated area, not on contact with masonry, and shall be installed at a moisture content not to exceed 8 percent except in areas of constant high humidity where the moisture content of the flooring shall not exceed 10 percent.
   1. Flooring Contractor shall provide documentation verifying proper acclimation of flooring material prior to installation. Review with Architect, Contractor, and Owner.
E. The Flooring Contractor is to provide a temperature/relative humidity data logger for indoor temperature and relative humidity monitoring. Coordinate location of temperature/relative data logger with Owner.
F. Manufacturer and or flooring contractor's advertising in the form of a logo or otherwise shall not be displayed.

1.05 WORKING CONDITIONS

A. The wood flooring shall not be installed until all masonry, plastering, tile, marble and terrazzo work is completed, and overhead mechanical trades and painters have finished in wood floor area. The building must be reasonably dry; all openings must be closed in; permanent heating and air conditioning installed and operating.
B. The concrete slab shall be dry, free of foreign materials, and turned over to the Wood Flooring Contractor broom clean. Moderate room temperature of 65 degrees (F) 18 degrees (C) or more shall be maintained a week preceding and throughout the duration of the work. Humidity conditions within the building shall approximate humidity conditions, which will prevail when the building is occupied. Care should be taken to maintain humidity within the range of 35 percent to 50 percent.

1.06 WARRANTY

A. (1) year manufacturer's warranty
B. During the warranty period, the floor cannot be coated without the permission of the floor contractor.

1.07 GUARANTEE

A. The Contractor shall guarantee his work for a period of One (1) years from date of Substantial Completion. Guarantee shall be on form included in Section 01 7800.

PART 2 PRODUCTS

2.01 MATERIALS - (MAIN GYMNASIUM)

A. Basis of Design Product: Subject to compliance with requirements, provide Action Floor Systems, LLC “ProAction Thrust”, or comparable DIN and ENCertified, product by one of the following:
   1. Conner Sports Floors.
   2. Robbins Floors.

B. Flooring:
   1. Flooring: Northern Hard Maple, standard strip flooring, 25/32 inch by 2-1/4 inch (20 mm x 57 mm) MFMA grade marked and stamped as manufactured by Action Floor Systems, LLC.
   2. Grade: 2nd and better.

C. Subfloor:
   1. Vapor Barrier: 6-mil polyethylene.
   2. Pads: ProAction 3/4 inch (19 mm) dual stage natural rubber pads.
   3. Panels: 15/32" x 4' x 8' (12 mm x 1.2 M x 2.4 M) 4ply CD face, exposure 1, rated plywood.

D. Fasteners:
   1. Subfloor Fasteners: 1 inch (25 mm) coated staples.
   2. Flooring Fasteners: 2 inch (50 mm) cleats, or 15-gauge coated staples.

E. Wall Base:
   1. Wall Base: 3 inch by 4 inch (76 mm by 102 mm) vented rubber cove base with pre-molded corners. Color as selected by Architect to match other rubber cove base on project.

F. Metal thresholds: 1/8 inch thick by 1/4 inch high by width required. 413 through 1013 by NGP or equal

2.02 MATERIALS - (AUXILIARY GYMNASIUM)

A. Basis of Design Product: Subject to compliance with requirements, provide Action Floor Systems, LLC "ProAction Thrust" product by one of the following:
   1. Conner Sports Floors.
   2. Robbins Floors.

B. Flooring:
   1. Flooring: Northern Hard Maple, standard strip flooring, 25/32 inch by 2-1/4 inch (20 mm x 57 mm) MFMA grade marked and stamped.
   2. Grade: 2nd and better.

C. Subfloor:
   1. Vapor Barrier: 6-mil polyethylene.
   2. Pads: ProAction 3/4 inch (19 mm) dual stage natural rubber pads.
   3. Panels: 15/32" x 4' x 8' (12 mm x 1.2 M x 2.4 M) 4ply CD face, exposure 1, rated plywood.

D. Fasteners:
   1. Subfloor Fasteners: 1 inch (25 mm) coated staples.
   2. Flooring Fasteners: 2 inch (50 mm) cleats, or 15-gauge coated staples.

E. Wall Base:
   1. Wall Base: 3 inch by 4 inch (76 mm x 102 mm) vented rubber cove base with pre-molded corners. Color as selected by Architect to match other rubber cove base on project.

F. Metal thresholds: 1/8 inch thick by 1/4 inch high by width required. 413 through 1013 by NGP or equal

2.03 MATERIALS - (DANCE STUDIO)

A. Basis of Design Product: Subject to compliance with requirements, provide Action Floor Systems, LLC "ProAction Thrust LP", or comparable product by one of the following:
   1. Conner Sports Floors.
   2. Robbins Floors.

B. Flooring:
   1. Flooring: Northern Hard Maple, standard strip flooring, 25/32 inch by 3-1/4 inch (20 mm by 76 mm) MFMA grade marked and stamped.
   2. Grade: 3rd and better.

C. Subfloor:
   1. Vapor Barrier: 6-mil polyethylene.
   2. Pads: ProAction 3/4 inch (19 mm) natural rubber pads, 50 durometer per pad.
   3. Panels:
      a. 1 - 3/8" x4' x 8' (10 mm x1.2 M x 2.4 m) CD face, exposure 1, rated plywood.
      b. 1 -15/32" x4' x 8' (12 mm x1.2 M x 2.4 m) CD face, exposure 1, rated plywood.

D. Fasteners:
   1. Subfloor Fasteners: 7/8 inch (22 mm) coated staples.
   2. Flooring Fasteners: 1-3/4 inch (44 mm) cleats, or 15-gauge coated staples.

E. Wall Base:
   1. Wall Base: 3 inch by 4 inch (76 mm by 102 mm) vented rubber cove base with pre-molded corners. Color as selected by Architect to match other rubber cove base on project.

F. Metal thresholds: 1/8 inch thick by 1/4 inch high by width required. 413 through 1013 by NGP or equal

2.04 FINISHES

A. Floor-Finish System: System of compatible components recommended in writing by flooring manufacturer, and MFMA approved.
   1. Note that the specified finishes must be waterborne products to meet State of Utah requirements.
   2. Approved Manufacturers:
      a. BonaKemi USA, Inc.
      b. PoloPlaz.
      c. Federal Finish.
   3. Floor-Sealer Formulation: Pliable, penetrating type. MFMA Group 1, Sealers.
      a. Application: Two (2) coats.
   4. Finish-Coat Formulation: Formulated for gloss finish (Main Gymnasium and Auxiliary Gymnasiums) and satin finish (Cheer/Dance Room) indicated and multi-coat application.
      a. Application: Three (3) coats.
   5. Game-Line, Marker, Lettering, and Logo Paint (As shown on drawings): Industrial enamel compatible with finish coats and recommended in writing by manufacturers of finish coats.
      a. Contractor to provide enough coats of paint for proper coverage.

PART 3 EXECUTION

3.01 INSPECTION

A. Inspect concrete slab for proper tolerance and dryness reporting any discrepancies in writing to the General Contractor.

B. All work to put the concrete slab in acceptable condition shall be the responsibility of the General Contractor.

3.02 INSTALLATION

A. Cover concrete slab with polyethylene lapping edges 6 inches (150 mm) and seal with adhesive or 2 inch (50 mm) duct tape.
B. Pads for wood flooring system shall be attached to the underside of the first layer of plywood as specified by the manufacturer.
C. Place the first layer of plywood diagonal or perpendicular to the intended direction of the finish flooring.
D. Fasten the second layer of plywood without pads at a 45-degree angle or at right angles to the first layer. (Apply construction adhesive in a box "x" pattern on the back of the second layer of sheathing for the LP floor). The plywood sheets must be nailed or stapled together with 1 inch (25 mm) or (7/8 inch (22mm) for the LP floor), fasteners starting from the center of the sheet working outward. No joint in the second layer of plywood shall coincide with a joint in the first layer. Allow 1/4 inch (6 mm) between panels at sides and edges, and a 2 inch (50 mm) expansion void at walls and vertical obstructions on both sheets of plywood.
E. Machine nail strip flooring into the plywood subfloor, parallel to the long dimension of the area nail approximately 12 inches (300 mm) on-center. Provide adequate expansion at regular intervals across the floor during installation as dictated by the average humidity conditions of the area according to the recommendations of the local Action Floor Systems, LLC. Flooring Contractor. Provide 2 inch (50 mm) expansion voids at perimeters and all vertical obstructions. Install vent cove base over perimeter voids and metal thresholds at doorways.

3.03 FLOOR SANDING

A. Use coarse, medium and fine grade sandpaper.
B. After sanding with a drum sander, buff entire floor using 100 grit screenback or equal grit sandpaper, with a heavy-duty buffing machine.
C. Vacuum or tack floor before first coat of finish.
D. Floor shall present a smooth surface without drum stop marks, gouges, streaks or shiners.

3.04 FINISHING

A. Inspect entire area of floor to ensure that the surface is acceptable for finishing, completely free from sanding dust and perfectly clean.
B. Apply seal and finish per manufacturer’s instructions.
C. Screenback or steel wool and vacuum or tack between each coat after it dries.
D. Apply game lines accurately after the seal coat, after buffing and vacuuming. Lay out in accordance with drawings. For game lines, use current rule of association having jurisdiction. Lines shall be straight with sharp edges in colors selected by the architect. Game line paint shall be compatible with finish.

3.05 BASE INSTALLATION

A. Affix rubber base to wall with recommended adhesive screws. Miter all corners carefully. Use pre-molded outside corners. Install aluminum thresholds as required, anchoring firmly in concrete floor beyond limits of wood flooring.

3.06 CLEAN UP

A. Clean up all unused materials and debris and remove from premises.

3.07 MAINTENANCE

A. Upon completion of floor installation, the owners attendants or individuals in charge and responsible for the upkeep of the building are to see that the care and maintenance instructions of the MFMA are followed. Failure to do so may void warranty.

END OF SECTION 09 6466 09 6466

SECTION 09 6500

RESILIENT FLOORING AND BASE - VCT

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Furnish all labor, materials, equipment, tools and services required to fully complete all Resilient Flooring work as is indicated on the drawings and/or specified herein including, but not limited to, the following described items.
B. Vinyl composition floor tile.
   1. Locations:
      a. Elevator.
      b. As indicated on drawings.
C. Resilient base and transition strips.
D. Do not include sales tax, refer to Section 00 1115 - Advertisement for Prequalification of Bidders.

1.02 RELATED REQUIREMENTS

A. Section 03 3000 - Cast-in-Place Concrete: Restrictions on curing compounds for concrete slabs and floors.
B. Section 09 0561 - Common Work Results for Flooring Preparation: Independent agency testing of concrete slabs, cleaning, and preparation.
C. Section 09 6566 - Resilient Athletic Flooring".
D. Section 09 6723 - Resinous Flooring.
E. Section 09 6800 - Broadloom Carpet".
F. Section 09 6813 - Tile Carpet"
G. Section 09 6819 - Entrance Floor Mats.
H. Section 14 2400 - Hydraulic Elevators, for elevator to receive floor tile
I. Division 26 - Electrical: Electrical Floor Cover plates for installation of resilient flooring specified in this section.

1.03 REFERENCE STANDARDS

A. ASTM E662 - Standard Test Method for Specific Optical Density of Smoke Generated by Solid Materials; 2021a, with Editorial Revision.
B. ASTM E648 - Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source; 2019a, with Editorial Revision (2020).
C. ASTM F1869 - Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride; 2016a.
D. ASTM F2170 - Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes; 2019a.
E. ASTM F710 - Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring; 2021.
F. ASTM F1066 - Standard Specification for Vinyl Composition Floor Tile; 2004 (Reapproved 2018).
G. NFPA 253 - Standard Method of Test for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source; 2019.
H. NFPA 258 - Recommended Practice for Determining Smoke Generation of Solid Materials; 2001.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide data on specified products, describing physical and performance characteristics; including sizes, patterns and colors available; and installation instructions.
C. Shop Drawings: Indicate locations of seams, edges, columns, doorways, enclosing partitions, built-in furniture, cabinets, and cutouts.
   1. Provide details of special patterns.
D. Selection Samples: Submit manufacturer's complete set of color samples for Architect's initial selection.
E. Verification Samples: Submit two samples, 12 by 12 inch in size illustrating color and pattern for each resilient flooring product specified.
F. Test Reports: Certified test reports showing compliance with specified performance characteristics and physical properties.
G. Concrete Testing Standard: Submit a copy of ASTM F710.
H. Certification: Prior to installation of flooring, submit written certification by flooring manufacturer and adhesive manufacturer that condition of sub-floor is acceptable.
I. Maintenance Data: Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning, stripping, and re-waxing.
J. Manufacturer's Field Reports: Manufacturer's field reports specified herein.

1.05 EXTRA MATERIALS

A. 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 Flooring Material: Furnish 1 box for every 50 boxes or fraction thereof, of each type, color, and pattern of floor tile installed.
   3. Extra Wall Base: 50 linear feet of each type and color.

1.06 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with minimum five years documented experience.
   1. Whenever possible, provide each type of resilient flooring as provided by a single manufacturer, including recommended primers, adhesives, sealants, and leveling compounds.
B. Installer Qualifications: Company specializing in performing work of this section with minimum five years experience and approved by manufacturer.
C. Regulatory Requirements:
   1. Fire Performance Characteristics: Provide resilient linoleum tile flooring with the following fire performance characteristics as determined by testing products in accordance with ASTM method indicated below by a certified testing laboratory or another testing and inspecting agency acceptable to authorities having jurisdiction:
   2. Critical Radiant Flux: Class 1 Rating per NFPA 253 (ASTM 648) (0.45 watts/cm² or greater).
   3. Smoke Density: Less than 450 per NFPA 258 (ASTM E662).

1.07 DELIVERY, STORAGE, AND HANDLING

A. Ordering: Comply with manufacturer's ordering instructions and lead time requirements to avoid construction delays.
B. Delivery: Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.

C. Upon receipt, immediately remove any shrink-wrap and check materials for damage and the correct style, color, quantity and run numbers.
D. Storage and Protection: Store materials protected from exposure to harmful weather conditions and at temperature and humidity conditions recommended by manufacturer.
   1. Material should be stored in areas that are fully enclosed, weathertight with the permanent HVAC system set at a uniform temperature of at least 68 degrees F (20 degrees C) for 48 hrs. prior to, during and after installation.
   2. Move resilient flooring and installation accessories into spaces where they will be installed at least 48 hours before installation, unless longer conditioning periods are required by manufacturer.
E. Maintain temperature in storage area between 55 degrees F and 90 degrees F.
F. Protect roll materials from damage by storing as recommended by manufacturer.

1.08 FIELD CONDITIONS

A. Store materials for not less than 48 hours prior to installation in area of installation at a temperature of 70 degrees F to achieve temperature stability. Thereafter, maintain conditions above 55 degrees F, until Substantial Completion
B. Substrate Conditions: Use the methods described below to determine the dryness and pH as required to ensure initial and long-term success. Testing to be done by an Independent Testing Agency, refer to Section 01 4000.
   1. ASTM F2170 Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes.
      a. This test method covers the quantitative determination of percent relative humidity in concrete slabs for field or laboratory tests.
      b. The relative humidity measured from the center of the concrete slab should not exceed 75 percent. If the test results exceed the limitations, the installation must not proceed until the problem has been corrected.
      c. Report the following information:
         1) Name and address of the structure.
         2) Date and time measurements were made. Name, title, and affiliation of worker performing the measurements.
         3) Locations and depths of probe holes within the structure.
         4) Relative humidity in each probe hole, to the nearest percent relative humidity.
         5) Temperature in each probe hole, to the nearest degree Celsius (Fahrenheit).
         6) Ambient air temperature, to the nearest degree Celsius (Fahrenheit) and relative humidity (to the nearest percent relative humidity) above each probe hole.
         7) Make, model, and last calibration date of the instrument used to make the measurements.
         8) Report any observations that might affect the interpretation of individual measurements such as standing water on the slab, wet coring operations, weather, or ventilating system operations.
   2. ASTM ASTM F1869 Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride:
      a. This test method covers the quantitative determination of the rate of moisture vapor emitted from below-grade, on-grade, and above-grade (suspended) concrete floors.
      b. The moisture vapor emissions rate should not exceed 5.0 lbs per 1,000 square feet within a 24-hour period. If the test results exceed the limitations, the installation must not proceed until the problem has been corrected.
      c. Number of Tests and Locations:

1) Perform three tests for the first 1000 ft2 (100 m2) and at least one additional test for each additional 1000 ft2 (100m2). Select test locations to provide information about moisture distribution across the entire concrete floor slab, especially areas of potential high moisture. For slabs on-grade and below-grade, include a test location within 1 m (3 ft) of each exterior wall.
2) The General Contractor shall be responsible for conducting one calcium chloride test for every 1,000 square feet (minimum 3 tests) to ensure concrete moisture emissions do not exceed 5.0 lbs per 1,000 square feet within a 24-hour period. If the test results exceed the limitations, the installation must not proceed until the problem has been corrected.
3) Report the following information:
   (a) Name and address of the structure.
   (b) Date and time measurements were made.
   (c) Name, title, and affiliation of worker performing the measurements.
   (d) Diagram of the area showing the locations of tests within the structure.
   (e) Results of each test conducted
4) Report any observations that might affect the interpretation of individual measurements such as standing water on the slab, wet coring operations, weather, or ventilating system operations.

3. Contingency for High Moisture Readings: If at the time of testing the moisture readings are in excess of 5.0 lbs the General Contractor will initiate testing using petrographic analysis to determine if the Water Cement Ratio and sufficient hydration has taken place. If the Specifications were not followed in their entirety, water/cement ratio (as specified), and or the concrete surface has been inadequately hydrated the Contractor responsible for the placement of the cement shall be responsible for the costs associated with the petrographic analysis and subsequent remediation requirements.
4. Concrete pH Test: Perform pH tests on concrete floors regardless of the age or grade level. If the pH is greater than 10, it must be neutralized prior to beginning the installation.

C. Environmental Requirements/Conditions: In accordance with manufacturer's recommendations, areas to receive flooring should be clean, fully enclosed and weathertight with the permanent HVAC system operational and set at a minimum of 68 degrees F (20 degrees C) for a minimum of 7 days prior to, during, and 7 days after the installation. The flooring material should be conditioned in the same manner for at least 48 hours prior to the installation. Maximum temperature should not exceed 100 degrees F after installation. Areas to receive flooring shall be adequately lighted to allow for proper inspection of the substrate, installation and final inspection.
D. Field Measurements: Verify actual measurements/openings by field measurements before fabrication; show recorded measurements on shop drawings. Coordinate field measurements and fabrication schedule with construction progress to avoid construction delays.
E. Finishing Operations: Install resilient flooring after finishing operations, including painting and ceiling operations, have been completed.

1.09 GUARANTEE

A. The Contractor shall guarantee his work for a period of One (1) year from date of Substantial Completion. Guarantee shall be on form included in Section 01 7800.
B. Manufacturer's Warranty: Submit, for Owner's acceptance, manufacturer's standard warranty document executed by authorized company official. Manufacturer's warranty is in addition to, and not a limitation of, other rights Owner may have under Contract Documents.
   1. Warranty Period: Five (5) year limited warranty commencing on Date of Substantial Completion.

PART 2 PRODUCTS

2.01 TILE FLOORING

A. Vinyl Composition Tile: Homogeneous, with color extending throughout thickness.
   1. Manufacturers: Subject to compliance with requirements, provide vinyl composition floor tile by one of the following::
      a. Tarkett Company: www.tarkett.com.
      b. Armstrong World Industries, Inc: www.armstrong.com.
      c. Substitutions: See Section 01 6000 - Product Requirements.
   2. Minimum Requirements: Comply with ASTM F1066, Class 2, through-pattern tile.
   3. Critical Radiant Flux (CRF): Minimum 0.45 watt per square centimeter, when tested in accordance with ASTM E 648 or ASTM E 648.
   4. Size: 12 by 12 inch.
   5. Thickness: 0.125 inch.
   6. Wearing Surface: Smooth.
   7. Pattern: As per drawings or determined by architect.
      a. Architect may select up to ten (10) different colors.

2.02 RESILIENT BASE

A. Resilient Base: ASTM F1861, Type TS rubber, vulcanized thermoset; top set Style B, Cove.
   1. Manufacturing Method: Group I (solid, homogeneous).
   2. Manufacturers:
      a. Burke Flooring: www.burkeflooring.com.
      b. Flexco Inc.: www.flexcofloors.com.
      c. Johnsonite, Tarkett Company. www:johnsonite.com.
      d. Roppe Corp: www.roppe.com.
      e. Mannington: www.mannington.com.
      f. Substitutions: See Section 01 6000 - Product Requirements.
   3. Critical Radiant Flux (CRF): Minimum 0.45 watt per square centimeter, when tested in accordance with ASTM E 648 or ASTM E 648.
   4. Height: 4 inch.
   5. Thickness: 0.125 inch.
   6. Finish: Satin.
   7. Length: Roll.
   8. Color: To be selected by Architect from manufacturer's full range.

2.03 ACCESSORIES

A. Subfloor Filler: White premix latex; type recommended by adhesive material manufacturer.
B. Primers, Adhesives, and Seam Sealer: Waterproof; types recommended by flooring manufacturer.
C. Reslient Moldings and Edge Strips: to include adaptors, reducers, transtitions, and edge guards as needed. Conditions include:
   1. Manufacturers:
      a. Johnsonite, Inc: www.johnsonite.com.
      b. Roppe Corporation: www.roppe.com.
      c. Substitutions: See Section 01 6000 - Product Requirements.
   2.
      a. Carpet to VCT - CTA-XX-A manufactured by Johnsonite, Inc.
      b. Carpet to Concrete - CTA-XX-P manufactured by Johnsonite, Inc.
      c. VCT - to - Concrete - SSR-XX-B manufactured by Johnsonite, Inc.

d. VCT to Stair Nosing - #1 Nosing by ROPPE.

D. Exact profiles to be determined once flooring materials have been selected and product thickness can be established
E. Color: As selected by Architect from manufacturer's standard colors.
F. Sealer and Wax: Types recommended by flooring manufacturer.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that surfaces are flat to tolerances acceptable to flooring manufacturer, free of cracks that might telegraph through flooring, clean, dry, and free of curing compounds, surface hardeners, and other chemicals that might interfere with bonding of flooring to substrate.
B. Verify that 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. Test in accordance with Section 09 0561.
D. Verify that required floor-mounted utilities are in correct location.

3.02 PREPARATION

A. Adjacent Surfaces Protection: Protect adjacent work areas and finish surfaces from damage during product installation.
B. Surface Preparation: Prepare floor substrate to be smooth, rigid, flat, permanently dry, clean and free of foreign materials such as dust, paint, grease, oils, solvent, curing and hardening compounds, sealers, asphalt and old adhesive residue.
C. Prepare floor substrates as recommended by flooring and adhesive manufacturers.
D. 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.
E. Prohibit traffic until filler is fully cured.
F. Clean substrate.
G. Apply primer as required to prevent "bleed-through" or interference with adhesion by substances that cannot be removed. Apply primer to wall surfaces.
H. Starting installation constitutes acceptance of sub-floor conditions.
I. Install in accordance with manufacturer's written instructions.
   1. Metal Strips: Attach to substrate before installation of flooring using stainless steel screws.
   2. Resilient Strips: Attach to substrate using adhesive.
J. Install flooring in recessed floor access covers, maintaining floor pattern.
K. Install custom designs, feature strips and patterns where indicated.

3.03 INSTALLATION - TILE FLOORING

A. Where demountable partitions and other items are indicated for installation on top of finished flooring, install flooring before these items are installed.
B. Lay out tiles from center marks established with principal walls, discounting minor offsets, so tiles at opposite edges of room are of equal width. Adjust as necessary to avoid using cut widths that equal less than one-half of a tile at perimeter
C. Lay tiles square with room axis, unless otherwise indicated CL Match tiles for color and pattern by selecting tiles from cartons in the same sequence as manufactured and packaged, if so numbered. Cut tiles neatly around all fixtures.
   1. Discard broken, cracked, chipped, or deformed tiles.
D. Lay border/accent tiles with grain running in one direction.

E. Lay field color tiles in basket-weave pattern with grain direction alternating in adjacent tiles.
F. Scribe, cut, and fit tiles to butt neatly and tightly to vertical surfaces and permanent fixtures, including built-in furniture, cabinets, pipes, outlets, edgings, door frames, thresholds, and nosings.
G. Extend tiles into toe spaces, door reveals, closets, and similar openings.
H. Maintain reference markers, holes, and openings that are in place or marked for future cuffing by repeating on finish flooring as marked on subfloor. Use chalk or other non-permanent, non-staining marking device.
I. Adhere tiles to flooring substrates using a full spread of adhesive applied to substrate to comply with tile manufacturer's written instructions, including those for trowel notching, adhesive mixing, and adhesive open and working times
J. Provide completed installation without open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, and other surface imperfections.
K. Roll resilient flooring using 100 lbs roller as required by resilient flooring manufacturer.
L. Do not install resilient flooring over expansion joints. Use expansion joint covers manufactured for use with resilient flooring. Refer to Section 07 9513 for expansion joint covers.
M. Finish Flooring Patterns: As selected and detailed by Architect.
N. Mix tile from container to ensure shade variations are consistent when tile is placed, unless otherwise indicated in manufacturer's installation instructions.

3.04 INSTALLATION - RESILIENT BASE

A. Fit joints tightly and make vertical. Maintain minimum dimension of 18 inches between joints.
B. Miter inside corners. Running base continuous through inside corners nor permitted.
C. At outside corners, run base continuous around corner and extend 12" minimum beyond corner if conditions allow
D. Install base on solid backing. Bond tightly to wall and floor surfaces.
E. Scribe and fit to door frames and other interruptions.

3.05 CLEANING

A. Remove excess adhesive from floor, base, and wall surfaces without damage.
B. Clean resilient flooring in accordance with manufacturer's instructions.
C. Tile Flooring:
    1. Sweep and/or dust all floors.
    2. Scrub floor using “Stride” neutral cleaner. Rinse floor thoroughly.
    3. Do not perform initial maintenance for a minimum of 5 days after installation has been completed. This is to allow the adhesive the proper time to set.

3.06 PROTECTION

A. Prohibit traffic on resilient flooring for 48 hours after installation.
B. Protect installed product and finish surfaces from damage during construction. Remove and dispose of protective covering at time of Substantial Completion.

3.07 SCHEDULE - REFER TO DRAWINGS

END OF SECTION 09 6500

This page intentionally left blank

SECTION 09 6800

SHEET CARPETING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Furnish all labor, materials, equipment, tools and services required to fully complete all Carpeting work as is indicated on the drawings and/or specified herein including, but not limited to, the following described items.
B. Broadloom carpet, direct-glued.
C. Accessories.
D. Do not include sales tax, refer to Section 00 1115 - Advertisement for Prequalification of Bidders.

1.02 RELATED REQUIREMENTS

A. Section 03 3000 - Cast-in-Place Concrete: Restrictions on curing compounds for concrete slabs and floors to receive adhesive-applied carpet.
B. Section 09 0561 - Common Work Results for Flooring Preparation: Independent agency testing of concrete slabs, cleaning, and preparation.
C. Section 09 6500 - Resilient Flooring and Base - VCT: Resilient base.
D. Section 09 6813 - Tile Carpeting.
E. Section 09 6819 - Entrance Flooring: Resilient transition strips.
F. Division 22 - Plumbing Specialties: Plumbing floor cover plate with recess for carpet.

1.03 REFERENCE STANDARDS

A. ASTM E648 - Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source; 2019a, with Editorial Revision (2020).
B. CRI 104 - Standard for Installation of Commercial Carpet; 2015.
C. NFPA 253 - Standard Method of Test for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source; 2019.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide data on specified products, describing physical and performance characteristics; sizes, patterns, colors available, and method of installation.
C. Shop Drawings: Indicate seaming plan, method of joining seams, direction of carpet pileand pattern, location of edge moldings and edge bindings, layout of flat wire system.
D. Samples: Submit two samples 12 inches by 12 inches in size illustrating color and pattern for each carpet and cushion material specified.
E. Submit two, 6 inch long samples of stair nosing, edge strip and transition strip for each color specified.
F. Manufacturer's Installation Instructions: Indicate special procedures and perimeter conditions requiring special attention.
G. Maintenance Data: Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning.
H. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
    1. See Section 01 6000 - Product Requirements, for additional requirements.
    2. Extra Carpet: 200 sq ft of each type, color, and pattern installed.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing specified carpet with minimum three years documented experience.
B. Installer Qualifications: Company specializing in installing carpet with minimum three years experience and approved by manufacturer.

1.06 FIELD CONDITIONS

A. Store materials in area of installation for minimum period of 24 hours prior to installation.
B. Maintain the temperature of the installation site, carpet, and adhesive between a minimum temperature of 65 degrees F and a maximum temperature of 95 degrees F for 24 hours before installation. Do not begin the installation if the room or subfloor temperature is below 65 degrees F. The adhesive will not function properly when applied over an extremely cold surface. Relative humidity should not exceed 65 percent. Maintain these conditions for 24 hours prior to, during and 24 hours after installation.
C. Ventilate installation area during installation and for 72 hours after installation.

1.07 WARRANTY

A. Provide 5 year written guarantee on installation by floor covering installer accompanied by written certification from Carpet Manufacturer verifying specified requirements have been met. Guarantee shall cover defects in workmanship and include statement that flooring installer shall, at no additional expense to Owner and upon written notice from Owner, promptly correct or replace improper work and material that may become apparent within 60 months after date of final completion. Installer shall complete corrective work within 15 days of receipt of Owner's written notice unless other arrangements are made in writing with Owner. Floor covering installer's Guarantee shall be in form given in Section 01 7800.
B. Provide carpet manufacturer's 10 year guarantee on floor covering including specific workmanship guarantees for delamination, edge raveling, fuzzing, piling, and other textural changes which can be controlled through proper manufacturing.

PART 2 PRODUCTS

2.01 CARPET

A. Sheet Carpeting: to coordinate with Tile Carpet selections from Section 09 6813.
B. For use in the following conditions:
    1. Auditorium - stairs and risers.
    2. Choral - riser and 6-inch nosing.
C. Acceptable Sheet Carpet Manufacturers and Products:
    1. Mannington Commercial
        a. Product: Glitch Art Collection
        b. Pattern: Circuit Broadloom
        c. Color: To Be Determined by the Architect
    2. Patcraft
        a. Product: Color Your World Collection
        b. Pattern: Color Your World
        c. Color: To Be Determined by the Architect
    3. Shaw Contract Group
        a. Product: Shade.
        b. Pattern: Gradient Broadloom.
        c. Color: To be determined by Architect.

2.02 ACCESSORIES

A. Sub-Floor Filler: Type recommended by carpet manufacturer.
B. Resilient Transition Strips:
   1. Manufacturers:
      a. Johnsonite, Inc: www.johnsonite.com.
      b. Roppe Corporation: www.roppe.com.
      c. Substitutions: See Section 01 6000 - Product Requirements.
   2. Material: Polyvinyl chloride (PVC)
   3. Carpet to Concrete: CTA-XX-P manufactured by Johnsonite, Inc.

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 carpet.
B. Verify that sub-floor surfaces are dust-free and free of substances that could impair bonding of adhesives to sub floor surfaces.
C. Cementitious Sub-floor Surfaces: Verify that substrates are dry enough and ready for flooring installation by testing for moisture and alkalinity (pH).
   1. Test in accordance with Section 09 0561.
   2. Obtain instructions if test results are not within limits recommended by flooring material manufacturer and adhesive materials manufacturer.
D. Verify that required floor-mounted utilities are in correct location.

3.02 PREPARATION

A. Prepare floor substrates for installation of flooring in accordance with Section 09 0561.

3.03 INSTALLATION - GENERAL

A. Starting installation constitutes acceptance of sub-floor conditions.
B. Install carpet and cushion in accordance with manufacturer's instructionsand CRI 104 (Commercial).
C. Verify carpet match before cutting to ensure minimal variation between dye lots.
D. Lay out carpet and locate seams in accordance with shop drawings.
   1. Locate seams in area of least traffic, out of areas of pivoting traffic, and parallel to main traffic.
   2. Do not locate seams perpendicular through door openings.
   3. Align run of pile in same direction as anticipated traffic and in same direction on adjacent pieces.
   4. Locate change of color or pattern between rooms under door centerline.
   5. Provide monolithic color, pattern, and texture match within any one area.
E. Install carpet tight and flat on subfloor, well fastened at edges, with a uniform appearance.

3.04 DIRECT-GLUED CARPET

A. Double cut carpet seams, with accurate pattern match. Make cuts straight, true, and unfrayed. Apply seam adhesive to cut edges of woven carpet immediately.
B. Apply contact adhesive to floor uniformly at rate recommended by manufacturer. After sufficient open time, press carpet into adhesive.
C. Apply seam adhesive to the base of the edge glued down. Lay adjoining piece with seam straight, not overlapped or peaked, and free of gaps.
D. Roll with appropriate roller for complete contact of adhesive to carpet backing.

E. Trim carpet neatly at walls and around interruptions.
F. Install carpet base according to manufacturer's instructions.

3.05 INSTALLATION ON RISERS

A. Install carpet according to manufacturer's instructions. Apply seam adhesive to all cut edges.
B. Install carpet with pile direction in the length of the riser.
C. Adhere carpet tight to risers.

3.06 CLEANING

A. Remove excess adhesive from floor and wall surfaces without damage.
B. Clean and vacuum carpet surfaces.

END OF SECTION 09 6800

SECTION 09 6813

TILE CARPETING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Furnish all labor, materials, equipment, tools and services required to fully complete all Tile Carpeting work as is indicated on the drawings or specified herein including, but not limited to, the following described items.
B. Carpet tile, fully adhered.
C. Accessories.
D. Do not include sales tax, refer to Section 00 1115 - Advertisement for Prequalification of Bidders.

1.02 RELATED REQUIREMENTS

A. Section 03 3000 - Cast-in-Place Concrete: Restrictions on curing compounds for concrete slabs and floors.
B. Section 09 0561 - Common Work Results for Flooring Preparation: Independent agency testing of concrete slabs, removal of existing floor coverings, cleaning, and preparation.
C. Section 09 6500 - Resilient Flooring and Base - VCT: Resilient base and transition strips.
D. Section 09 6800 - Sheet Carpeting: Broadloom carpet.
E. Section 09 6819 - Entrance Flooring: Resilient transition strips.
F. Division 22 - Plumbing Specialties: Plumbing floor cover plate with recess for carpet.

1.03 REFERENCE STANDARDS

A. ASTM F710 - Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring; 2021.

1.04 ADMINISTRATIVE REQUIREMENTS

A. General Contractor and Installer shall coordinate with Owner to ensure timely ordering of carpet tile.

1.05 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, colors available, and method of installation.
C. Samples: Submit two carpet tiles illustrating color and pattern design for each carpet color selected.
D. Submit two 6-inch long samples of transition strip, edge strip, base cap, and stair nosing .
E. Manufacturer's Installation Instructions: Indicate special procedures and perimeter conditions requiring special attention.
F. Maintenance Data: Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning.
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 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 approved by the Floor Covering Installation Board or who can demonstrate compliance with its certification program requirements. Installer shall furnish upon request of owner or Architect, five (5) references from commercial carpet projects of similar scope, completed within the last five (5) years.
    1. Flooring contractor must be approved by the manufacturer prior to bid.
    2. Installer shall furnish, upon request of owner or architect, five references from commercial carpet projects of similar scope completed within the last five years.
    3. Flooring contractor possessing the contract for product installation shall not sub-contract the labor portion without written approval of the Project Manager
    4. Flooring contractor will be responsible for the proper product installation, including floor testing and preparation as specified by the manufacturer and job conditions.
    5. Flooring contractor shall provide toMurray City School District a written installation warranty that covers the completed installation to free from defects in workmanship for a period of 5 years after job completion..
C. Fire Test Response Characteristics: Provide products with the critical radiant flux classification indicated in Part 2, as determined by testing identical products per ASTM E 648 by an independent testing and inspecting Agency acceptable to authorities having jurisdiction.
D. Product Options: Products and manufacturers named in Part 2 establish requirements for product quality in terms of appearance, construction and performance

1.07 FIELD CONDITIONS

A. Comply with CRI 104 - Standard for Installation of Commercial Carpet; Carpet and Rug Institute; 2015.Section 5, Storage and Handling.
B. Store materials in area of installation for minimum period of 24 hours prior to installation.
C. Maintain the temperature of the installation site, carpet, and adhesive between a minimum temperature of 65 degrees F and a maximum temperature of 95 degrees F for 24 hours before installation. Do not begin the installation if the room or subfloor temperature is below 65 degrees F. The adhesive will not function properly when applied over an extremely cold surface. Relative humidity should not exceed 65 percent. Maintain these conditions for 24 hours prior to, during and 24 hours after installation.
D. Do not install carpet over concrete slabs until slabs have cured and are sufficiently dry to bond with adhesive and concrete slabs have pH range recommended by carpet manufacturer.
E. Where demountable partitions or other items are indicated for installation on top of carpet, install carpet before installing these items.

1.08 WARRANTY

A. Provide 1-year written guarantee on installation by floor covering installer accompanied by written certification from Carpet Manufacturer verifying specified requirements have been met. Guarantee shall cover defects in workmanship and include statement that flooring installer shall, at no additional expense to Owner and upon written notice from Owner, promptly correct or replace improper work and material that may become apparent within 60 months after date of final completion. Installer shall complete corrective work within 15 days of receipt of Owner's written notice unless other arrangements are made in writing with Owner. Floor covering installer's Guarantee shall be in form given in Section 01 7800.

B. Lifetime Limited Commercial Carpet Warranty: Written warranty, signed by carpet manufacturer agreeing to replace carpet that does not comply with requirements or that fails within specified warranty period. Warranty does not include deterioration or failure of carpet due to unusual traffic, failure of substrate, vandalism or abuse. Failures include, but are not limited to, more than 10 percent loss of face fiber, edge raveling, snags, runs, and delamination
   1. Warranty Period: 15 year minimum.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Tile Carpeting:
   1. Shaw Contract: https://www.shawcontract.com.
   2. Mannington Commercial: www.manningtoncommercial.com.
   3. Mohawk Group: www.mohawkgroup.com.

2.02 MATERIALS

A. Contractors may bid any or all of the products listed below.
B. Modular Carpet Products listed below to include (1) Field Tile and up to (2) Accent Tiles in patterns to be determined by the Architect.
C. Acceptable Modular Carpet Manufacturers and Products:
   1. Mannington Commercial: www.manningtoncommercial.com.
      a. Product: Glitch Art Collection.
      b. Patterns: Cross Talk, Hub and Circuit.
      c. Backing: Infinity RE Modular.
   2. Mohawk Group: www.mohawkgroup.com.
      a. Product: Learn & Live.
      b. Patterns: Swipe Right and Side Stripe.
      c. Backing: EcoFlex.
   3. Shaw Contract Group: www.shawcontract.com.
      a. Product: Altered.
      b. Patterns: Analog and Glitch.
      c. Backing: EcoWorx.
D. Refer to 09 6800 Sheet Carpeting for Carpet Base specifications.

2.03 ACCESSORIES

A. Sub-Floor Filler: Type recommended by flooring material manufacturer.
B. Primer: Type recommended by flooring material manufacturer.
C. Adhesive: Manufacturer's recommended adhesive that can withstand moisture up to 95% RH.
D. Resilient Transition Strips:
   1. Manufacturers:
      a. Johnsonite, Inc: www.johnsonite.com.
      b. Roppe Corporation: www.roppe.com.
      c. Substitutions: See Section 01 6000 - Product Requirements.
   2. Material: Polyvinyl chloride (PVC).
   3. Carpet to Concrete: CTA-XX-P manufactured by Johnsonite, Inc.

PART 3 EXECUTION

3.01 INSPECTION

A. Testing:
   1. Testing to be done by an Independent Testing Agency, refer to Section 01 4000.

2. Test in accordance with ASTM F 710.
3. Test the concrete for alkalinity prior to beginning the installation. Test the concrete for surface pH at several locations. A reading below 5.0 or above 9.0 requires corrective measures. Follow manufacturer's recommendations on the correct method of neutralizing low or high pH.
4. Test the concrete for moisture at several locations using anhydrous calcium chloride test kits. The moisture transmission rate must not exceed 5.0 lbs. per 1000 sq. ft. per 24 hours. Do not begin the installation if an unacceptable moisture level is detected. Do not use other methods of moisture testing as they are not reliable. If excessive moisture is present, the General Contractor, Architect and Owner must be advised and a decision made if the installation is to begin.

3.02 EXAMINATION

A. Verify that sub-floor surfaces are smooth and flat within tolerances specified for that type of work and are ready to receive carpet tile.
B. Verify that sub-floor surfaces are dust-free and free of substances that could impair bonding of adhesive materials to sub-floor surfaces.
C. Cementitious Sub-floor Surfaces: Verify that substrates are dry enough and ready for flooring installation by testing for moisture and pH.
   1. Test in accordance with Section 09 0561.
   2. Obtain instructions if test results are not within limits recommended by flooring material manufacturer and adhesive materials manufacturer.
D. Verify that required floor-mounted utilities are in correct location.

3.03 PREPARATION

A. The floor must be dry, free of dust, dirt, oil, grease, paint, wax, or any debris that could affect adhesion of the carpet modules to the floor.
B. Do not use sweeping compounds as they may leave oily deposits. The floor must be level and smooth. Depressions and cracks must be filled with a liquid latex additive patching compound and all protrusions leveled.
C. Concrete floors must be sealed with liquid latex recommended by manufacturer if dusting or powdering exists.
D. Apply latex primer as recommended by manufacturer.

3.04 SITE LAYOUT

A. The starting point in a modular installation must be as near to the center of the room as possible and must be positioned to utilize the largest perimeter cut module size.
B. Snap a chalk line parallel to one major wall bisecting the starting point. It may be necessary to offset the center chalk line to assure perimeter modules will be at least half size.
C. A second chalk line must be snapped from the starting point at 90 degrees to the first line. This can be accomplished using a 3-4-5, 6-8-10, or larger triangle, depending on the room size. Meters or feet may be used to lay out the triangle in these proportions.

3.05 ADHESIVE APPLICATION

A. As recommended by manufacturer use a premium pressure sensitive adhesive. A 3/8 inch foam paint roller, 1/16 inch v-notch trowel or flat trowel may be used to apply the adhesive. Application of adhesive by means of a sprayer is not allowed. Allow the adhesive sufficient open time so that it will not transfer to the back of the tile.
B. The adhesive must be allowed to dry completely before installing the carpet. Installing into wet adhesive will result into a permanent bond and may cause carpet to bubble.

C. A full spread of adhesive is required.

3.06 INSTALLATION

A. Starting installation constitutes acceptance of sub-floor conditions.
B. Install carpet tile in accordance with manufacturer's instructions.
C. Begin the installation by installing according to the carton number. Each module has directional arrows on the backing. Refer to Architect and Manufacturer for directional pattern.
D. Installation must begin at the intersection of two chalk lines. Installation must continue until completed in one quadrant, then proceed to an adjoining quadrant until all four quadrants are completed. Larger areas may require chalk lines bisecting the original four quadrants.
E. Install modules using the pyramid technique. This allows multiple alignment checks. If the edges do not align and the misalignment increases with progression of the installation, the source of the problem must be identified and corrected.
F. Slide modules into position to prevent yarn from being trapped between the modules. Trapped yarn will adversely affect the appearance of the installation and will cause alignment problems.
G. Modules must fit snugly, but not be compressed. Press the entire surface of the tile to ensure adhesion. Check for fit by measuring the length of ten full modules after installation. The measurement must not be less than, or exceed by more than 1/4 inch, the length of the modules being multiplied by ten. For example: if 24 x 24 inch modules are being installed, the measurement should be between 240 and 240 1/4 inches.
H. Cutting Techniques:
    1. Modules may be cut by measuring and cutting from the back using a straight edge. Care must be taken to assure the arrows are pointing in the correct direction.
    2. Modules may also be cut by letting them cove up the wall and cutting with a cushion back wall trimmer or similar tool. Do not compress.
I. Roll the entire installation with a 75 lb roller once it is completed.
J. Blend carpet from different cartons to ensure minimal variation in color match.
K. Cut carpet tile clean. Fit carpet tight to intersection with vertical surfaces without gaps.
L. Trim carpet tile neatly at walls and around interruptions.
M. Complete installation of transition strips, concealing exposed edges.

3.07 CLEANING

A. Remove excess adhesive without damage, from floor, base, and wall surfaces.
B. Clean and vacuum carpet surfaces.

3.08 PROTECTION

A. Use plywood over the carpet when heavy objects are moved within 24 hours after installation.
B. A non-staining building material paper must be placed over the carpet to protect it when additional construction activity is to take place that would soil or stain it. Do not use plastic sheeting as it will trap moisture.

END OF SECTION 09 6813

This page intentionally left blank

SECTION 09 6819

ENTRANCE FLOORING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Furnish all labor, materials, equipment, tools and services required to fully complete all Entrance Flooring work as is indicated on the drawings or specified herein including, but not limited to, the following described items.
B. Entrance flooring, direct glue down installation.
C. Accessories.
D. Do not include sales tax, refer to Section 00 1115 - Advertisement for Prequalification of Bidders.

1.02 RELATED REQUIREMENTS

A. Section 03 3000 - Cast-in-Place Concrete: Restrictions on curing compounds for concrete slabs and floors to receive adhesive-applied flooring.
B. Section 09 0561 - Common Work Results for Flooring Preparation: Independent agency testing of concrete slabs, removal of existing floor coverings, cleaning, and preparation.
C. Section 09 6800 - Carpeting.
D. Section 09 6813 - Tile Carpeting.

1.03 REFERENCE STANDARDS

A. ASTM F710 - Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring; 2021.
B. CRI 104 - Standard for Installation of Commercial Carpet; 2015.

1.04 ADMINISTRATIVE REQUIREMENTS

A. General Contractor and Installer shall coordinate with Owner to insure timely ordering of carpet tile.

1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Shop Drawings: Indicate layout of joints, direction of carpet pile, and location of edge moldings.
C. Product Data: Provide data on specified products, describing physical and performance characteristics; sizes, patterns, colors available, and method of installation.
D. Samples: Submit two carpet tiles illustrating color and pattern design for each carpet color selected.
E. Submit two, 6 inch (150 mm) long samples of transition strip.
F. Manufacturer's Installation Instructions: Indicate special procedures and perimeter conditions requiring special attention.
G. Maintenance Data: Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning.
H. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
    1. See Section 01 6000 - Product Requirements, for additional provisions.
    2. Extra Carpet Tiles: 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 flooring with minimum five years documented experience.
B. Installer Qualifications: Company specializing in installing flooring with minimum three years experience and with minimum five years documented experience and approved by manufacturer.

1.07 FIELD CONDITIONS

A. Store materials in area of installation for minimum period of 24 hours prior to installation.
B. Maintain the temperature of the installation site, carpet, and adhesive between a minimum temperature of 65 degrees F and a maximum temperature of 95 degrees F for 24 hours before installation. Do not begin the installation if the room or subfloor temperature is below 65 degrees F. The adhesive will not function properly when applied over an extremely cold surface. Relative humidity should not exceed 65 percent. Maintain these conditions for 24 hours prior to, during and 24 hours after installation.

1.08 WARRANTY

A. Provide 1 year written guarantee on installation by floor covering installer accompanied by written certification from Carpet Manufacturer verifying specified requirements have been met. Guarantee shall cover defects in workmanship and include statement that flooring installer shall, at no additional expense to Owner and upon written notice from Owner, promptly correct or replace improper work and material that may become apparent within 60 months after date of final completion. Installer shall complete corrective work within 15 days of receipt of Owner's written notice unless other arrangements are made in writing with Owner. Floor covering installer's Guarantee shall be in form given in Section 01 7800.
B. Provide carpet manufacturer's 15 year guarantee on floor covering including specific workmanship guarantees for delamination, edge raveling, fuzzing, piling, and other textural changes which can be controlled through proper manufacturing.

PART 2 PRODUCTS

2.01 MATERIALS

A. Contractors may bid any or all of the products listed below.
B. Acceptable Entrance Flooring Manufacturers and Products:
    1. Mannington Commercial: www.manningtoncommercial.com
        a. Product: Liason Collection
        b. Pattern: Ruffian II
        c. Backing: Infinity RE Modular
    2. Patcraft: www.patcraft.com
        a. Product: Beyond the Door Collection
        b. Pattern: Paseo
        c. Backing: EcoWorx Tile
    3. Shaw Contract Group: www.shawgroup.com
        a. Product: Steppin Out Collection
        b. Pattern: Bon Jour II
        c. Backing: EcoWorx Tile
    4. Substitutions: See Section 01 6000 - Product Requirements.

a. Substitution requests must contain the following product information: Method of Construction, Fiber, Dye Method, Treatments, Primary and Secondary Backing, Warranties, Stitches per Inch, Pile Thickness, Yarn Weight per sq yd, Average Density, Sizes.

2.02 ACCESSORIES

A. Sub-Floor Filler: White premix latex; type recommended by flooring manufacturer.
B. Primer: Latex primer; type recommended by flooring manufacturer.
C. Resilient Transition Strips:
   1. Manufacturers:
      a. Johnsonite, Inc: www.johnsonite.com.
      b. Roppe Corporation: www.roppe.com.
      c. Substitutions: See Section 01 6000 - Product Requirements.
   2. Entrance Flooring to Carpet: Polyvinyl chloride (PVC), 1 1/2 inch (38 mm) wide level transition for adjoining 1/4 inch (6 mm) and 5/16 inch (8 mm) carpet, 1/4 inch (6 mm) long snap-in stem with single flange vinyl track base.
      a. Product: CD-XX with Track CDB-00-A manufactured by Johnsonite, Inc.
D. Adhesives - General: Acceptable to carpet tile manufacturer, compatible with materials being adhered.
   1. Manufacturer's recommended adhesive that can withstand moisture up to 95% RH.

PART 3 EXECUTION

3.01 INSPECTION

A. Testing:
   1. Testing to be done by an Independent Testing Agency, refer to Section 01 4000.
   2. Test in accordance with ASTM F710.
   3. Test the concrete for alkalinity prior to beginning the installation. Test the concrete for surface pH at several locations. A reading below 5.0 or above 9.0 requires corrective measures. Follow manufacturer's recommendations on the correct method of neutralizing low or high pH.
   4. Test the concrete for moisture at several locations using anhydrous calcium chloride test kits. The moisture transmission rate must not exceed 5.0 lbs. per 1000 sq. ft. per 24 hours. Do not begin the installation if an unacceptable moisture level is detected. Do not use other methods of moisture testing as they are not reliable. If excessive moisture is present, the General Contractor, Architect and Owner must be advised and a decision made if the installation is to begin.

3.02 EXAMINATION

A. Verify that sub-floor surfaces are smooth and flat within tolerances specified for that type of work and are ready to receive carpet tile.
B. Verify that sub-floor surfaces are dust-free and free of substances that could impair bonding of adhesive materials to sub-floor surfaces.
C. Cementitious Sub-floor Surfaces: Verify that substrates are dry enough and ready for flooring installation by testing for moisture and pH.
   1. Test in accordance with Section 09 0561.
   2. Obtain instructions if test results are not within limits recommended by flooring material manufacturer and adhesive materials manufacturer.
D. Verify that required floor-mounted utilities are in correct location.

3.03 PREPARATION

A. The floor must be dry, free of dust, dirt, oil, grease, paint, wax, or any debris that could affect adhesion of the carpet modules to the floor.
B. Do not use sweeping compounds as they may leave oily deposits. The floor must be level and smooth. Depressions and cracks must be filled with a liquid latex additive patching compound and all protrusions leveled.
C. Concrete floors must be sealed with liquid latex recommended by manufacturer if dusting or powdering exists.
D. Apply latex primer as recommended by manufacturer.

3.04 SITE LAYOUT

A. The starting point in a modular installation must be as near to the center of the room as possible and must be positioned to utilize the largest perimeter cut module size.
B. Snap a chalk line parallel to one major wall bisecting the starting point. It may be necessary to offset the center chalk line to assure perimeter modules will be at least half size.
C. A second chalk line must be snapped from the starting point at 90 degrees to the first line. This can be accomplished using a 3-4-5, 6-8-10, or larger triangle, depending on the room size. Meters or feet may be used to lay out the triangle in these proportions.

3.05 ADHESIVE APPLICATION

A. As recommended by manufacturer use a premium pressure sensitive adhesive. A 3/8 inch foam paint roller, 1/16 inch v-notch trowel or flat trowel may be used to apply the adhesive. Application of adhesive by means of a sprayer is not allowed. Allow the adhesive sufficient open time so that it will not transfer to the back of the tile.
B. The adhesive must be allowed to dry completely before installing the carpet. Installing into wet adhesive will result into a permanent bond and may cause carpet to bubble.
C. A full spread of adhesive is required.

3.06 INSTALLATION

A. Starting installation constitutes acceptance of sub-floor conditions.
B. Install carpet tile in accordance with manufacturer's instructions and CRI 104 Carpet Installation Standard.
C. Begin the installation by installing according to the carton number. Each module has directional arrows on the backing. Refer to Architect and Manufacturer for directional pattern.
D. Installation must begin at the intersection of two chalk lines. Installation must continue until completed in one quadrant, then proceed to an adjoining quadrant until all four quadrants are completed. Larger areas may require chalk lines bisecting the original four quadrants.
E. Install modules using the pyramid technique. This allows multiple alignment checks. If the edges do not align and the misalignment increases with progression of the installation, the source of the problem must be identified and corrected.
F. Slide modules into position to prevent yarn from being trapped between the modules. Trapped yarn will adversely affect the appearance of the installation and will cause alignment problems.
G. Modules must fit snugly, but not be compressed. Press the entire surface of the tile to ensure adhesion. Check for fit by measuring the length of ten full modules after installation. The measurement must not be less than, or exceed by more than 1/4 inch, the length of the modules being multiplied by ten. For example: if 24 x 24 inch modules are being installed, the measurement should be between 240 and 240 1/4 inches.
H. Cutting Techniques:

1. Modules may be cut by measuring and cutting from the back using a straight edge. Care must be taken to assure the arrows are pointing in the correct direction.
2. Modules may also be cut by letting them cove up the wall and cutting with a cushion back wall trimmer or similar tool. Do not compress.

I. Roll the entire installation with a 75 lb roller once it is completed.
J. Complete installation of edge strips, concealing exposed edges.

3.07 CLEANING

A. Remove excess adhesive without damage, from floor, base, and wall surfaces.
B. Clean and vacuum flooring surfaces.

3.08 PROTECTION

A. Use plywood over the carpet when heavy objects are moved within 24 hours after installation.
B. A non-staining building material paper must be placed over the carpet to protect it when additional construction activity is to take place that would soil or stain it. Do not use plastic sheeting as it will trap moisture.

END OF SECTION 09 6819

This page intentionally left blank

SECTION 09 7200

GRAPHIC WALLCOVERING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Furnish all labor, materials, equipment, tools and services required to fully complete all Graphic Wallcovering work as is indicated on the drawings and/or specified herein including, but not limited to, the following described item.
B. Graphic wallcovering:
   1. Locations: A109 Cafeteria, B143 Reception, B117 Counseling.
C. Do not include sales tax, refer to Section 00 0104 - Notice to Contractors.

1.02 RELATED REQUIREMENTS

A. Section 08 4313 - Aluminum-Framed Storefronts: Graphic film applied to interior and exterior glass.
B. Section 09 2116 - Gypsum Board Assemblies: Gypsum board finish requirements to receive wallcovering.
C. Section 09 9123 - Interior Painting: Wall painting requirements to receive wallcovering.

1.03 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide manufacturers' data sheets on wallcovering and adhesives.
C. Shop Drawings: Indicate wallcovering layout, artwork, and wall devices that interfere with artwork.
D. Samples: Provide samples equal to 24 by 24 inches of each artwork.
E. Maintenance Data: Include recommended cleaning methods, cleaning materials, and stain removal methods.

1.04 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the types of products specified in this section, with minimum five years of documented experience.
B. Installer Qualifications: Company specializing in performing tile installation, with minimum of five years of documented experience.

1.05 FIELD CONDITIONS

A. Areas where wallcovering will be installed shall have a constant minimum temperature of not less than 60 degrees F for at least seven days prior to and throughout installation period and for seven days thereafter.

1.06 GUARANTEE

A. This Contractor shall guarantee his work for a period of One (1) years from date of Substantial Completion. Guarantee shall be on form included in Section 01 7800.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Basis-of-Design Product:
   1. Vision Wall Covering by Vision Graphics; visiondoesit.com.

B. Artwork: Graphic files shall be furnished by Owner/Architect for printing use.
C. Burning Characteristics The manufacturer shall certify at the time of shipment that the materials furnished meet the published flame spread and smoke development Fire Hazard Classification Rating(s) of those products when tested according to ASTM-E84 Tunnel Test.
D. Adhesive The adhesive used must be manufacturer's recommended adhesive and must contain mildew inhibitors.

PART 3 EXECUTION

3.01 INSPECTION

A. Installer shall inspect all areas and conditions under which wallcoverings are to be installed. Installer shall notify the contractor and architect in writing of any conditions detrimental to the proper and timely completion of the installation; work will proceed only when conditions have been corrected and accepted by the installer.
B. Substrate shall be checked with a suitable moisture meter. Moisture shall not exceed 4 percent.

3.02 SURFACE PREPARATION

A. Wall surfaces shall be free from defects and imperfections that could show through the finished covered surface.
B. Sand-finished plaster shall be smoothed, cinder or cement blocks shall be plastered, or otherwise rendered smooth, and old wallcoverings shall be removed.
C. For new drywall construction, manufacturer's recommended primer should be used before application of wallcovering for ease of future removal when redecorating.
D. Glossy surfaces shall either be sanded to dull surface, or a coat of manufacturer's recommended primer applied prior to installation of wallcovering.
E. If there is any evidence of mildew, it must be removed, and the wall surface treated to inhibit further mildew growth.
F. All painted surfaces should be evaluated for the possibility of pigment bleed-through. If there is any possibility, a coat of sealer, recommended by the manufacturer, should be applied before application of the wallcovering.
G. Do not install wallcovering over oil-based wood stains as a bleed-through may occur.

3.03 INSTALLATION

A. Wallcovering shall be installed by experienced workers and contractors in strict accordance with the manufacturer's printed instructions using wallcovering adhesive recommended by the manufacturer (WHEAT PASTE SHALL NOT BE USED). It is absolutely imperative that installer read the manufacturer's instruction sheet in each roll before installing the wallcovering. Permanent building light shall be available for installation.
B. Installer, before cutting, shall examine pattern and color and determine that they are the correct pattern and color as specified.
C. Installer shall install each roll in sequence starting with largest roll number and each strip in same sequence as cut from roll. If pattern is not random, examine for repeat design. Some patterns should be lined up, matched or reversed for best results. If necessary, trim selvage deep enough to assure color uniformity.
D. After application of three strips, an inspection should be made and if there are any variations in color or pattern which are felt to be excessive, the wallcovering distributor or manufacturer's representative should be notified for his inspection before any further wallcovering is installed.
E. Always bring material six (6) inches around inside and outside corners being sure to fit into corners to avoid bridging or spanning.
F. The wallcovering should be smoothed to the hanging surface with a stiff bristled sweep brush or a flexible broad-knife to eliminate air bubbles. Avoid burnishing the face of the material.

G. Remove excess adhesive along finished seam immediately after each wallcovering strip is applied. Use of clean, warm water, a natural sponge, and clean towels are recommended for this use. It is very important to change water often to maintain cleanliness.

3.04 CLEAN-UP COMPLETION

A. Upon completion of work, remove surplus materials, rubbish and debris, resulting from the wallcovering installation. Leave areas in neat, clean and orderly condition.

END OF SECTION 09 7200

This page intentionally left blank

SECTION 09 8400

ACOUSTIC ROOM COMPONENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Furnish all labor, materials, equipment, tools and services required to fully complete all Acoustic Room Component work as is indicated on the drawings and/or specified herein including, but not limited to, the following described items.
B. Fabric-covered fiberglass core panels and mounting accessories.
C. High-impact fabric-covered fiberglass core panels and mounting accessories.
D. Do not include sales tax, refer to Section 00 0102 - Notice to Contractors.

1.02 RELATED REQUIREMENTS

A. Section 01 6116 - Volatile Organic Compound (VOC) Content Restrictions.
B. Section 09 5100 - Acoustical Ceilings: Suspension system for pyramidal ceiling diffusers.
C. Section 09 5153 - Direct-Applied Acoustical Ceilings.
D. Section 09 8413 - Cementitious Wood Fiber Acoustic Panels.

1.03 REFERENCE STANDARDS

A. ASTM C423 - Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method; 2022.
B. ASTM E795 - Standard Practices for Mounting Test Specimens During Sound Absorption Tests; 2016.

1.04 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 .
E. Verification Samples: Fabricated samples of each type of panel specified; 12 x 12 in, showing construction, edge details, and fabric covering.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company with not less than 5 years of experience in manufacturing acoustical products similar to those specified.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Protect acoustical panels from moisture during shipment, storage, and handling. Deliver in factory-wrapped bundles; do not open bundles until panels are needed for installation.
B. Store panels flat, in dry, well-ventilated space; do not stand panels on end.
C. Protect panel edges from damage.

1.07 MOCK-UP

A. See Section 01 4000 - Quality Requirements, for additional mock-up requirements.
B. Construct mock-up of one acoustical panel at location indicated by Architect.
    1. Coordinate with Section 06 2000 - Finish Carpentry.
    2. Approved mock-up may remain as part of the Work.

1.08 GUARANTEE

A. The Contractor shall guarantee his work for a period of 5 years from date of Substantial Completion. Guarantee shall be on form included in Section 01 7800.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Acoustical Components:
   1. Lamvin, Inc: www.lamvin.com.
   2. Conwed Designscape: www.conweddesignscape.com.
   3. Wenger Corporation: www.wengercorp.com.
   4. Sound Concepts: www.soundconceptscan.com.
   5. Vertical Wall Solutions: www.verticalwallsolutions.com.
   6. AcousticsFirst Corporation: www.acousticsfirst.com.
   7. Sound Seal: www.soundseal.com.
   8. A & D Specialties: www.a-d-acousticalpanels.com.

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

2.02 ACOUSTICAL WALL PANELS

A. Panels: Prefinished, factory assembled fabric-covered panels.
   1. Surface Burning Characteristics: Flame spread index of 25 or less and smoke developed index of 450 or less, when tested in accordance with ASTM E84.

B. Fiberglass Core Panels:
   1. Density: 6-7 lb/cu ft.
   2. Noise Reduction Coefficient (NRC): 1.0 - 1.10 when tested in accordance with ASTM E 795 .
   3. Panel Width: As detailed on drawings.
   4. Panel Height: As detailed on drawings.
   5. Panel Thickness: 1 inch and 2 inch as indicated on drawings.
   6. Edges: Perimeter edges chemically hardened to reinforce panel perimeter against warpage and damage.
   7. Corners: Square.
   8. Mounting and Framing: Refer to Drawings for wall mount.

C. Fabric Covering: Seamless fabric facing material, for bonded covering of core material.
   1. Fabric: Acoustically transparent 100 percent woven polyester, 2-ply, 16 ounce, wrapped a minimum of 1 1/2 inches (38 mm) to the back of panel.
   2. Color: As selected by Architect from manufacturer's full range.
   3. Patterns: Where fabric with directional or repeating patterns or fabric with directional weave is used, mark for installation in same direction.

D. Acceptable Product: Sonic Series Standard Acoustical Panel by Lamvin, Inc.

2.03 FABRICATION

A. General: Fabricate panels to sizes and configurations indicated, 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.

B. Tolerances: Fabricate to finished tolerance of plus or minus 1/16 in for thickness, overall length and width, and squareness from corner to corner.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine substrates for conditions detrimental to installation of acoustical panels. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION

A. Install acoustical panels in locations indicated, following installation recommendations of panel manufacturer. Align panels accurately, with edges plumb and top edges level. Scribe to fit accurately at adjoining work and penetrations.
B. Install panels to construction tolerances of plus or minus 1/16 in for the following:
   1. Plumb and level.
   2. Flatness.
   3. Width of joints.

3.03 CLEANING

A. Clean fabric facing upon completion of installation from dust and other foreign materials, following manufacturer's instructions.
B. Remove surplus materials, trimmed portions of panels, and debris resulting from installation.

3.04 PROTECTION

A. Provide protection of installed acoustical panels until completion of the work.
B. Replace panels that cannot be cleaned and repaired to satisfaction of the Architect.

END OF SECTION 09 8400

This page intentionally left blank

SECTION 09 8405

CEILING DIFFUSER PANELS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Furnish all labor, materials, equipment, tools and services required to fully complete all Acoustic Room Component work as is indicated on the drawings and/or specified herein including, but not limited to, the following described items.
   1. Lay-in grid-mounted ceiling diffuser panels.
   2. Do not include sales tax, refer to Section 00 0104 - Notice to Contractors.

1.02 RELATED SECTIONS:

A. Section 09 5100 - Suspended Acoustical Ceilings: Suspension grid.

1.03 REFERENCES

1.04 SUBMITTALS

A. Product Data: Manufacturer’s data sheets, installation instructions, and maintenance recommendations for each type of acoustical absorber and diffuser panel.
   1. Include data indicating coefficients of absorption and Sabines per unit for each type of panel used in the analysis and proposed design layout.
B. Product Test Reports: Indicating compliance of products with requirements, from a qualified independent testing agency.
C. Shop Drawings: Prepared by manufacturer. Include elevations showing acoustic room components sizes, arrangements, and details of each condition of installation. Show fabrication and installation details.
D. Samples: For each color and finish for each exposed acoustic room component:
   1. For fabric selection from manufacturer's full range of not less than 40 colors.
E. Maintenance Data: Include fabric manufacturer's cleaning and stain-removal instructions.
F. Warranty: Submit sample meeting warranty requirements of this Section.

1.05 COORDINATION

A. Coordinate requirements for blocking required in frame construction to receive acoustical absorber and diffuser panels.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, and handle acoustical absorber and diffuser panels in accordance with panel and fabric manufacturers' recommendations. Ship to jobsite only after roughing-in, painting work, and other related finish work has been completed and installation areas are ready to accept units and recommended temperature and humidity levels will be maintained during the remainder of construction.

1.07 WARRANTY

A. Special Warranty: Manufacturer's written warranty indicating manufacturer’s intent to repair or replace acoustical absorber and diffuser panels that fail in materials or workmanship within [5] years from date of Substantial Completion. Failures are defined to include, but are not limited to, the following:

1. Fracturing or breaking of unit components which results from normal wear and tear and normal use other than vandalism.
2. Delamination or other failures of glue bond of components.
3. Warping of components not resulting from leaks, flooding, or other uncontrolled moisture or humidity.
4. Failure of unit to perform acoustically in accordance with manufacturer's published data.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Basis of Design Manufacturer:
   1. Wenger Corporation, Owatonna, MN; Telephone: 1-800-887-7145.

2.02 MATERIALS

A. Thermoplastic Sheet: PVC acrylic plastic sheet, flame spread index 25 maximum, and smoke-developed index 450 maximum.

2.03 SOUND-DIFFUSING PANELS

A. Convex Ceiling Diffuser Panels: Acoustically-configured, polycylindrical convex molded thermoplastic panel, .125 inch (3 mm) thick, and width and length indicated.
   1. Basis of Design Product: Wenger Convex Ceiling Diffuser Panels.
   2. Finish: Manufacturer's standard textured white.
   3. Ceiling Panel Mounting Method: Lay-in ceiling grid safety cables.
   4. Size: 4 feet by 4 feet by 8 inch.

2.04 ACCESSORIES

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine acoustical absorber and diffuser panels installation substrates and surroundings for compliance with requirements for installation tolerances, including required overhead clearances, and other existing conditions affecting installation and performance of acoustical absorber and diffuser panels. Proceed with unit installation upon correction of unsatisfactory conditions.

3.02 ACOUSTICAL ABSORBER AND DIFFUSER PANELS INSTALLATION

A. Install units plumb, level, and true. Install in accordance with manufacturer’s recommendations and approved submittals.
B. Install ceiling-mounted acoustical panels utilizing integral corner mounting brackets and one or more of the following mounting methods as indicated:
   1. Suspended: Hang panels plumb and free from structural members. Use carrying channels where structural members cannot be used. Use post-installed anchors in concrete slabs.
   2. Ceiling Grid Mounted: Mount and fasten panels to grid using grid clips.
   3. Install seismic bracing and fastening in accordance with CISCA's "Ceiling Systems Handbook" and approved shop drawings.
C. Do not modify panels in the field.

3.03 FIELD QUALITY CONTROL

A. Should completed installation fail to meet requirements, Contractor shall make modifications necessary to correct performance and retest room as directed by Architect to indicate compliance, at Contractor's expense.

3.04 CLEANING

A. Repair or replace defective work as directed by Architect upon inspection.
B. Clean unit surfaces. Touch up, refinish, or replace damaged components in a manner acceptable to Architect.

END OF SECTION 098400 09 8405

This page intentionally left blank

SECTION 09 8413

CEMENTITIOUS WOOD FIBER ACOUSTIC PANELS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Furnish all labor, materials, equipment, tools and services required to fully complete all Acoustic Panel work as is indicated on the drawings and/or specified herein including, but not limited to, the following described items.
B. Cementitious wood fiber acoustical wall panels.
C. Cementitious wood fiber acoustical ceiling panels.
D. Mounting accessories.
E. Trim accessories
F. Do not include sales tax, refer to Section 00 0104 - Notice to Contractors.

1.02 RELATED SECTIONS

A. Section 06 4100 - Architectural Woodwork.
B. Section 09 5100 - Acoustical Ceilings.
C. Section 09 8400 - Acoustical Panels
D. Section 09 9123 - Painting and Coating:

1.03 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Product Data: Submit manufacturer's product data and installation instructions.
    1. Recommended procedures for cleaning and removal of stains including precautions in use of cleaning materials that may be detrimental to surfaces.
C. Shop Drawings: Fabrication and installation details and panel layout.
D. Samples: Submit two panels, 12 x 12 inch in size, illustrating construction and edge details.
E. Warranty: Submit manufacturer warranty and ensure that forms have been completed in Murray City School District 's name and registered with manufacturer.

1.04 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company with not less than five years of experience in manufacturing acoustical products similar to those specified.
B. Installer Qualifications: Company specializing in performing the work of this section with minimum five years of experience.

1.05 DELIVERY, STORAGE, AND PROTECTION

A. Protect acoustical panels from moisture during shipment, storage, and handling. Deliver in factory-wrapped bundles; do not open bundles until panels are needed for installation.
B. Store panels flat, in dry, well-ventilated space; do not stand panels on end.
C. Protect panel edges from damage.

1.06 FIELD CONDITIONS

A. Do not install acoustical panels until building is closed in and HVAC system is operational.
B. Locate materials onsite at least 24 hours before beginning installation to allow materials to reach temperature and moisture content equilibrium.
C. Maintain the following conditions in areas where acoustical materials are to be installed 24 hours before, during and after installation:

1. Relative Humidity: 65 - 75 percent.
2. Uniform Temperature: 55 - 70 degrees F (13 - 21 degrees C).

1.07 GUARANTEE

A. The Contractor shall guarantee his work for a period of One (1) year from date of Substantial Completion. Guarantee shall be on form included in Section 01 7800.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Tectum, Inc: www.tectum.com.
B. Substitutions: See Section 01 6000 - Product Requirements.

2.02 MATERIALS

A. Type - TWP: Acoustical Wall Panels:
   1. Product: TECTUM Direct-Attach Walls.
   2. Material: Aspen wood fibers bonded with inorganic hydraulic cement.
   3. Thickness: 1 inch (25 mm).
   4. Noise Reduction Coefficient (NRC): 0.85
   5. Edges: Beveled (all 4 sides).
   6. Finish: Field painted
   7. Size: Custom size as detailed on drawings.
   8. Mounting: C-40, as detailed on drawings.
   9. Fire Performance:
      a. Class "A" rated.
      b. Flamespread: 25 or less.
      c. Smoke Developed: 450 or less.
B. Type - TWP: Acoustical Wall Ceiling:
   1. Product: TECTUM Direct-Attach Ceilings.
   2. Material: Aspen wood fibers bonded with inorganic hydraulic cement.
   3. Thickness: 1 inch (25 mm).
   4. Noise Reduction Coefficient (NRC): 0.85.
   5. Edges: Beveled (all 4 sides).
   6. Finish: Field painted.
   7. Size: As detailed on drawings.
   8. Mounting: C-40 as detailed on drawings.
   9. Fire Performance:
      a. Class "A" rated.
      b. Flamespread: 25 or less.
      c. Smoke Developed: 450 or less.

2.03 ACCESSORIES

A. Furring:
   1. Walls: 1 1/2 inch x 20 gauge galvanized metal hat channels.
   2. Ceilings: 7/8 inch x 20 gauge galvanized metal hat channels.
B. Insulation: 1 1/2 inch (R-8) noise barrier batt insulation at walls.
C. Fasteners: 1 5/8 inch sharp point screws with coordinating painted face.
D. Pre-finished metal framing closure trim.
   1. Pre-Finished Galvanized Steel: ASTM A653/A653M, with G90/Z275 zinc coating; minimum 24 gage, 0.03125 inch thick base metal, shop pre-coated with PVDF coating

a. Finish Side: PVDF (Polyvinylidene Fluoride) Coating: High Performance Organic Finish, AAMA 621, AAMA 2605; multiple coat, thermally cured fluoropolymer finish system.
   1) Thickness: 1.0 mil total dry film thickness, minimum.
   2) Color: As selected by architect from manufacturer's full range of colors.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine substrates for conditions detrimental to installation of acoustical panels. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION

A. Follow manufacturer's installation instructions and recommendations.
B. Install materials in accordance with governing regulations, fire resistance rating requirements and industry standards applicable to work.
   1. Comply with CISCA (AC) Code of Practices.
C. Install acoustical panels in locations indicated. Align panels accurately, with edges plumb and top edges level. Scribe to fit accurately at adjoining work and penetrations.
D. Screw head to be flush with panel surface.
E. Securely affix wall panels by means of splines attached vertically to smooth wall or furring strips. Engage vertical kerfs on the edges of the wall panels with splines. Apply adhesive where necessary.
F. Cover field cut edges by means of trim or other moldings.
G. Screw Attachment:
   1. For wall applications on 24 inch (610 mm) wide panels, two screws per furring crossing are required; for 32 inch (813 mm) and 48 inch (1220 mm) side panels, three screws per furring crossing is required. The screws are to be spaced 1 inch from the panel edges and where three are required, the third screw is centered.
   2. In moderate or high impact areas, such as gymnasium walls less than 12 feet (3.7 m) above the floor and ceilings less than 20 feet (6 m), additional screws or construction adhesive is required.
H. Install panels to construction tolerances of plus or minus 1/16 in for the following:
   1. Plumb and level.
   2. Flatness.
   3. Width of joints.

3.03 CLEANING

A. Clean exposed surfaces of acoustical panel, trim, moldings and suspension members to comply with manufacturer’s instructions for cleaning.
B. Touch up any minor finish damage.
C. Remove and replace work that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

3.04 PROTECTION OF FINISHED WORK

A. Protect installed work from damage due to subsequent construction activity, including temperature and humidity limitations and dust control, so that the work will be without damage and deterioration at the time of acceptance by the Owner.
B. Replace panels that cannot be cleaned and repaired to satisfaction of the Architect.

END OF SECTION 09 8413

This page intentionally left blank

SECTION 09 9113

EXTERIOR PAINTING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Furnish all labor, materials, equipment, tools and services required to fully complete all Exterior Painting work as is indicated on the drawings and/or specified herein including, but not limited to, the following described items.
   1. Field application of paints and on the following surfaces as applicable
      a. Concrete.
      b. Concrete masonry units (CMU).
      c. Steel.
      d. Galvanized metal.
      e. Aluminum (not anodized or otherwise coated).
      f. Wood.

B. Surface preparation of substrates as required for acceptance of painting, including high pressure washing, abrasive blasting, cleaning, small crack repair, patching, and caulking..

C. Scope: Finish exterior surfaces exposed to view, unless fully factory-finished and unless otherwise indicated, including the following:
   1. The term "exposed" includes areas visible through permanent and built-in fixtures when they are in place.
   2. Both sides and edges of plywood backboards for electrical and telecom equipment before installing equipment.
   3. Finish top, bottom, and side edges of exterior doors the same as exposed faces.
   4. Exposed surfaces of steel lintels and ledge angles.
   5. Mechanical and Electrical:
      a. On the roof and outdoors, paint equipment that is exposed to weather or to view, unless factory-finished.
   6. Finish interior surfaces of air ducts that are visible through grilles and louvers with one coat of flat black paint to visible surfaces.
   7. Finish dampers exposed behind louvers, grilles, to match face panels.

D. Do Not Paint or Finish the Following Items:
   1. Items factory-finished unless otherwise indicated; materials and products having factory-applied primers are not considered factory finished.
   2. Items indicated to receive other finishes.
   3. Items indicated to remain unfinished.
   4. Fire rating labels, equipment serial number and capacity labels, and operating parts of equipment.
   5. Non-metallic roofing and flashing.
   6. Stainless steel, anodized aluminum, bronze, terne-coated stainless steel, zinc, and lead.
      a. Unless indicated
   7. Marble, granite, slate, and other natural stones.
   8. Floors, unless specifically indicated.
   9. Ceramic and other types of tiles.
   10. Brick, glass unit masonry, architectural concrete, cast stone, integrally colored plaster and stucco.
   11. Glass.
   12. Concealed pipes, ducts, and conduits.

E. Do not include sales tax, refer to Section 00 1115 - Advertisement for Prequalification of Bidders

1.02 RELATED REQUIREMENTS

A. Section 05 5000 - Metal Fabrications: Shop-primed items.
B. Section 07 1900 - Exterior Water Repellents and Graffiti Resistant Sealers
C. Section 09 9123 - Interior Painting.
D. Section 09 9724 - Sealers - Interior Concrete, Precast and Masonry Sealers

1.03 DEFINITIONS

A. Comply with ASTM D16 for interpretation of terms used in this section.
B. Gloss Level 1: Not more than 5 units at 60 degrees and 10 units at 85 degrees, according to ASTM D523, a matte flat finish.
C. Gloss Level 2: Not more than 10 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D 523, a high-side sheen flat, velvet-like finish.
D. Gloss Level 3: 10 to 25 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D 523, an eggshell finish.
E. Gloss Level 4: 20 to 35 units at 60 degrees and not less than 35 units at 85 degrees, according to ASTM D 523, a satin-like finish.
F. Gloss Level 5: 35 to 70 units at 60 degrees, according to ASTM D 523, a semi-gloss finish.
G. Gloss Level 6: 70 to 85 units at 60 degrees, according to ASTM D 523, a gloss finish.

1.04 REFERENCE STANDARDS

A. 40 CFR 59, Subpart D - National Volatile Organic Compound Emission Standards for Architectural Coatings; U.S. Environmental Protection Agency; current edition.
B. ASTM D16 - Standard Terminology for Paint, Related Coatings, Materials, and Applications; 2016.
C. ASTM D4442 - Standard Test Methods for Direct Moisture Content Measurement of Wood and Wood-Based Materials; 2020.
D. ASTM D523 - Standard Test Method for Specular Gloss; 2014 (Reapproved 2018).
E. MPI (APSM) - Master Painters Institute Architectural Painting Specification Manual; Current Edition.
F. SSPC-SP 1 - Solvent Cleaning; 2015, with Editorial Revision (2016).
G. SSPC-SP 2 - Hand Tool Cleaning; 2018.
H. SSPC-SP 6 - Commercial Blast Cleaning; 2007.
I. SSPC-SP 13 - Surface Preparation of Concrete; 2018.

1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide complete list of products to be used, with the following information for each:
    1. Manufacturer's name, product name and/or catalog number, and general product category (e.g. "alkyd enamel").
    2. Cross-reference to specified paint system(s) product is to be used in; include description of each system.
    3. Manufacturer's installation instructions.
    4. If proposal of substitutions is allowed under submittal procedures, explanation of substitutions proposed.
C. Samples: Submit three paper "draw down" samples, 8-1/2 by 11 inches in size, illustrating range of colors available for each finishing product specified.

1. Where sheen is specified, submit samples in only that sheen.
2. Where sheen is not specified, submit each color in each sheen available.
3. Allow 30 days for approval process, after receipt of complete samples by Architect.
4. Paint color submittals will not be considered until color submittals for major materials not to be painted, such as masonry, have been approved.

D. Certification: By manufacturer that paints and finishes comply with VOC limits specified.
E. Manufacturer's Instructions: Indicate special surface preparation procedures.
F. Maintenance Data: Submit data including finish schedule showing where each product/color/finish was used, product technical data sheets, material safety data sheets (MSDS), care and cleaning instructions, touch-up procedures, repair of painted and finished surfaces, and color samples of each color and finish used.
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 Paint and Finish Materials: 1 gallon of each color; from the same product run, store where directed.
   3. Label each container with color and type in addition to the manufacturer's label.

1.06 QUALITY ASSURANCE

A. This Contractor shall have a minimum of five (5) years proven satisfactory experience and shall show proof before commencement of work that he will maintain a qualified crew of painters throughout the duration of the work. Contractor shall provide a list of the last three comparable jobs including, name and location, project manager, start/completion dates and value of painting work.
B. Material Safety Data Sheets: At project site maintain file of MSDS sheets for each product used; become familiar with and follow manufacturer's stated application and safety requirements.
C. All surfaces requiring painting/coating shall be inspected by the Painting/Coating Manufacturer's Product Representative who shall notify the Architect and General Contractor in writing of any defects or problems, prior to commencing painting work, or after the prime coat shows defects in the substrate. The Manufacturer's Product Representative shall provide a written certification of all surfaces and conditions for paint or coating system application as well as on site supervision, inspection and approval of the application.
D. The painting contractor shall receive written confirmation of the specific surface preparation procedures and primers used for all fabricated steel items from the fabricator/supplier to ascertain appropriate and manufacturer compatible finish coat materials to be used before painting any such work.
E. Manufacturer Qualifications: Company specializing in manufacturing the products specified, with minimum three years documented experience.
F. Applicator Qualifications: Company specializing in performing the type of work specified with minimum 5 years experience and approved by manufacturer.

1.07 MOCK-UP

A. See Section 01 4000 - Quality Requirements, for general requirements for mock-up.
B. Prepare and paint each type of surface shown as requiring finish, to requirements specified herein, with specified paint or coating showing selected colors, gloss/sheen, textures and workmanship for review and approval.
C. Provide door and frame assembly illustrating paint color, texture, and finish.
D. Locate where directed by Architect.
E. When approved, surfaces shall become acceptable standard of finish quality and workmanship for remainder of on-site work.
F. Mock-up may remain as part of the work.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.
B. Container Label: Include manufacturer's name, type of paint, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.
C. Paint Materials: Store at minimum ambient temperature of 45 degrees F and a maximum of 90 degrees F, in ventilated area, and as required by manufacturer's instructions.

1.09 FIELD CONDITIONS

A. Do not apply materials when surface and ambient temperatures are outside the paint product manufacturer's temperature ranges.
B. Follow manufacturer's recommended procedures for producing best results, including testing of substrates, moisture in substrates, and humidity and temperature limitations.
C. Do not apply exterior paint and finishes during rain or snow, or when relative humidity is outside the humidity ranges required by the paint product manufacturer.
D. Minimum Application Temperatures for Latex Paints: 50 degrees F for exterior; unless required otherwise by manufacturer's instructions.
E. Provide lighting level of 80 ft candles measured mid-height at substrate surface.

1.10 GUARANTEE

A. The Contractor shall guarantee his work for a period of One (1) year from date of Substantial Completion. Guarantee shall be on form included in Section 01 7800.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Provide paints and finishes from the same manufacturer to the greatest extent possible.
    1. If a single manufacturer cannot provide specified products, minor exceptions will be permitted provided approval by Architect is obtained using the specified procedures for substitutions.
    2. Substitution of other products by the same manufacturer is preferred over substitution of products by a different manufacturer.
B. Basis of Design Products: Subject to compliance with requirements, provide company products indicated from one of the following:
    1. Sherwin-Williams
    2. PPG Architectural Finishes, Inc: (Devoe Paints)
C. Primer Sealers: Same manufacturer as top coats.

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. Provide materials that are compatible with one another and the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.
    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 described explicitly in manufacturer's product instructions.

B. Volatile Organic Compound (VOC) Content:
   1. Provide paints and finishes that comply with the most stringent requirements specified in the following:
      a. VOC Content: Utah Administrative Code R307-361 Products shall comply with VOC limits of authorities having jurisdiction and, for interior and exterior paints and coatings applied at Project site, the following VOC limits, exclusive of colorants added to a tint base, when calculated according to 40 CFR 59, Subpart D--National Volatile Organic Compound Emission Standards for Architectural Coatings.
         1) Flat Paints and Coatings: 50 g/L.
         2) Non flat Paints and Coatings: 100 g/L.
         3) Dry-Fog Coatings: 150 g/L.
         4) Primers, Sealers, and Undercoaters: 100 g/L.
         5) Industrial maintenance Coatings Applied to Ferrous Metals: 250 g/L.
         6) Zinc-Rich Industrial Maintenance Primers: 340 g/L.
         7) Pretreatment Wash Primers: 420 g/L.
         8) Floor Coatings Foot Traffic: 100 g/L.
         9) Floor Coatings High Performance: 250 g/L.
         10) Shellacs, Clear: 730 g/L.
         11) Shellacs, Pigmented: 550 g/L.
         12) Wood Coatings: 275 g/L

C. Flammability: Comply with applicable code for surface burning characteristics.

D. Chemical Content: The following compounds are prohibited:
   1. Aromatic Compounds: In excess of 1.0 percent by weight of total aromatic compounds (hydrocarbon compounds containing one or more benzene rings).
   2. Acrolein, acrylonitrile, antimony, benzene, butyl benzyl phthalate, cadmium, di (2-ethylhexyl) phthalate, di-n-butyl phthalate, di-n-octyl phthalate, 1,2-dichlorobenzene, diethyl phthalate, dimethyl phthalate, ethylbenzene, formaldehyde, hexavalent chromium, isophorone, lead, mercury, methyl ethyl ketone, methyl isobutyl ketone, methylene chloride, naphthalene, toluene (methylbenzene), 1,1,1-trichloroethane, vinyl chloride.

E. Sheens: Provide the sheens specified; where sheen is not specified, sheen will be selected later by Architect from the manufacturer's full line.

F. Colors: To be selected from manufacturer's full range of available colors.
   1. Selection to be made by Architect after award of contract.
   2. Allow for minimum of three colors for each system, unless otherwise indicated, without additional cost to Owner.
   3. Extend colors to surface edges; colors may change at any edge as directed by Architect.

2.03 PAINT SYSTEMS - EXTERIOR

A. Concrete Masonry Units and Precast Architectural Concrete:
   1. Refer to Section 03 3543 - Polished Concrete Finishing
   2. Refer to Section 07 1900 - Exterior Water Repellents and Graffiti Resistant Sealers
   3. Refer to Section 09 9724 - Sealers - Interior Concrete, Precast and Masonry Sealers

B. Concrete and Masonry - Walls (smooth) Satin Finish
   1. Primer:
      a. Product: S/W Loxon Primer A24W300
      b. Product: PPG 4-603XI Perma-Crete Alkali Resistant High PH Masonry Primer
   2. 1st coat:
      a. Product: S/W A-100 Exterior Latex Satin
      b. Product: PPG 6-2110XI Speed-hide 100% Acrylic Exterior Latex Satin
   3. 2nd coat:
      a. Product: S/W A-100 Exterior Latex Satin

b. Product: PPG 6-2110XI Speed-hide 100% Acrylic Exterior Latex Satin

C. CMU & Block Areas (Porous): Satin Finish
   1. Filler:
      a. Product: S/W Loxon Block Surfacer
      b. Product: PPG 4-100XI Perma Create Concrete Masonry Surfacer/Filler
   2. 1st coat:
      a. Product: S/W A-100 Exterior Latex Satin
      b. Product: PPG 6-2110XI Speed-hide 100% Acrylic Exterior Latex Satin
   3. 2nd coat:
      a. Product: S/W A-100 Exterior Latex Satin
      b. Product: PPG 6-2110XI Speed-hide 100% Acrylic Exterior Latex Satin

D. Exterior Wood (Painted) Latex Satin Finish
   1. Primer: Exterior Latex Wood Primer
      a. Product: S/W Premium. Wall & Wood
      b. Product: PPG 17-9517 Seal Grip Interior 100% Acrylic Latex Wood Undercoat
   2. 1st coat:
      a. Product: S/W A-100 Exterior Latex Satin
      b. Product: PPG 6-2110XI Speed-hide 100% Acrylic Exterior Latex Satin
   3. 2nd coat:
      a. Product: S/W A-100 Exterior Latex Satin
      b. Product: PPG 6-2110XI Speed-hide 100% Acrylic Exterior Latex Satin

E. Exterior Ferrous Metal -: Semi-Gloss Finish
   HM Doors, Frames and Miscellaneous Metals
   1. Primer:
      a. Product: S/W Pro industrial Pro-Cryl Universal Metal Primer
      b. Product: PPG 4020-1000 Pitt-Tech Interior/Exterior Primer Finish DTM Industrial Enamel
   2. 1st coat:
      a. Product: S/W Pro Industrial Acrylic Semi-gloss
      b. Product: PPG 4216 Pitt Tech Plus DTM Acrylic Semi-Gloss Finish
   3. 2nd coat:
      a. Product: S/W Pro Industrial Acrylic Semi-gloss
      b. Product: PPG 4216 Pitt Tech Plus DTM Acrylic Semi-Gloss Finish

F. Exterior Non-Ferrous Metal - Galvanized/Aluminum Metal Surfaces: Semi-Gloss Finish
   Handrails
   1. Primer:
      a. Product: S/W Pro industrial Pro-Cryl Universal Metal Primer
      b. Product: PPG 4020-1000 Pitt-Tech Interior/Exterior Primer Finish DTM Industrial Enamel
   2. 1st coat:
      a. Product: S/W Pro Industrial Water Based Alkyd Urethane, B53 Series
      b. Product: PPG 90-1210 Series Pitt-Tech plus Interior/Exterior
   3. 2nd coat:
      a. Product: S/W Pro Industrial Water Based Alkyd Urethane, B53 Series
      b. Product: PPG 90-1210 Series Pitt-Tech plus Interior/Exterior

G. Ferrous and Non-ferrous Metals- Alternate (Single Component Acrylic Urethane)
   1. Primer:
      a. Product: S/W Pro-Cryl Universal Metal Primer B66-310 series
      b. Product: PPG 4020-1000 Pitt-Tech Interior/Exterior Primer
   2. 1st coat:
      a. Product: S-W Shercryl Semi-Gloss, B66-350 Series

b. Product: PPG 90-1210 Series Pitt-Tech Plus

3. 2nd coat:
   a. Product: S-W Shercryl Semi-Gloss, B66-350 Series
   b. Product: PPG 90-1210 Series Pitt-Tech Plus

H. Stainless Steel Substrates: Epoxy System
1. Prime Coat: Primer, epoxy, anti-corrosive, for metal.
   a. Product: S/W Tile-Clad / 646; applied at 4 mils dft.
   b. Product: PPG Amerlock 400 High Solids Epoxy; applied at 4 mils dft.
2. Intermediate Coat:
   a. Epoxy, matching topcoat.
3. Topcoat:
   a. Product: S/W Hi-Solids Polyurethane B65W300 Gloss Ultra; applied at 3 mils dft per coat.
   b. Product: PPG Pitthane Ultra Acrylic Aliphatic Urethane Gloss, 95-812/95-819 Series; applied at 2 mils dft per coat.

2.04 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. Do not begin application of paints and finishes until substrates have been properly prepared.
B. Obtain written certification from Manufacturer's Product Representative that surfaces are ready to receive Work.
C. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially effect proper application.
D. Test shop-applied primer for compatibility with subsequent cover materials.
E. Measure moisture content of surfaces using an electronic moisture meter. Do not apply finishes unless moisture content of surfaces are below the following maximums:
1. Masonry, Concrete, and Concrete Masonry Units: 12 percent.
2. Exterior Wood: 15 percent, measured in accordance with ASTM D4442.

F. Measure the ph factor of concrete, masonry, and mortar before starting any finishing process.
1. Report results in writing to Architect before starting work.
2. If results of test indicates need for remedial action, provide written description of remedial action. If a different primer or paint systems is required, state the total cost of the change. Do not proceed with remedial action or change without receiving written authorization from Architect.

3.02 PREPARATION

A. Clean surfaces thoroughly and correct defects prior to application.
B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
C. Remove or repair existing paints or finishes that exhibit surface defects.
D. Remove or mask surface appurtenances, including electrical plates, hardware, light fixture trim, escutcheons, and fittings, prior to preparing surfaces for finishing.
E. Seal surfaces that might cause bleed through or staining of topcoat.

F. Remove mildew from impervious surfaces by scrubbing with solution of tetra-sodium phosphate and bleach. Rinse with clean water and allow surface to dry.

G. Concrete:
   1. Remove release agents, curing compounds, efflorescence, and chalk. Do not coat surfaces if moisture content or alkalinity of surfaces to be coated exceeds that permitted in manufacturer's written instructions.
   2. Clean surfaces with pressurized water. Use pressure range of 1,500 to 4,000 psi at 6 to 12 inches. Allow to dry.
   3. Prepare surface as recommended by top coat manufacturer and according to SSPC-SP 13.

H. Masonry:
   1. Remove efflorescence and chalk. Do not coat surfaces if moisture content or alkalinity of surfaces or if alkalinity of mortar joints exceed that permitted in manufacturer's written instructions. Allow to dry.
   2. Prepare surface as recommended by top coat manufacturer.
   3. Clean surfaces with pressurized water. Use pressure range of 600 to 1,500 psi at 6 to 12 inches. Allow to dry.

I. Aluminum: Remove surface contamination and oils and wash with solvent according to SSPC-SP 1.

J. Galvanized Surfaces:
   1. Remove surface contamination and oils and wash with solvent according to SSPC-SP 1.
   2. Prepare surface according to SSPC-SP 2.

K. Ferrous Metal:
   1. Solvent clean according to SSPC-SP 1.
   2. All dirt, fabrication and cutting oils, accumulated salts, rust, and mill must be removed prior to application of finish materials.
   3. Clean galvanized surfaces with nonpetroleum-based solvents so surface is free of oil and surface contaminants. Remove pretreatment from galvanized sheet metal fabricated from coil stock by mechanical or chemical methods as recommended as best practice by primer manufacturer.
   4. Shop-Primed Steel Surfaces to be Finish Painted: Use solvent or mechanical cleaning methods that comply with the Steel Structures Painting Council's (SSPC) recommendations. Touch up bare areas and shop-applied prime coats that have been damaged. Wire-brush, clean with solvents recommended by paint manufacturer, and touch up with the same primer as the shop coat. Re-prime entire shop-primed item.
   5. 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.

L. Exterior Wood Surfaces to Receive Opaque Finish: Remove dust, grit, and foreign matter. Seal knots, pitch streaks, and sappy sections. Fill nail holes with tinted exterior calking compound after prime coat has been applied. Back prime concealed surfaces before installation.

M. Metal Doors to be Painted: Prime metal door top and bottom edge surfaces.

3.03 APPLICATION

A. Remove unfinished louvers, grilles, covers, and access panels on mechanical and electrical components and paint separately.

B. Exterior Wood to Receive Opaque Finish: If final painting must be delayed more than 2 weeks after installation of woodwork, apply primer within 2 weeks and final coating within 4 weeks.

C. Apply products in accordance with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual".

D. Where adjacent sealant is to be painted, do not apply finish coats until sealant is applied.
E. Do not apply finishes over dirt, rust, scale, grease, moisture, scuffed surfaces, or other conditions detrimental to formation of a durable coating film;
F. Do not apply finishes to surfaces that are not dry. Allow applied coats to dry before next coat is applied.
G. Apply each coat to uniform appearance.
H. Vacuum clean surfaces of loose particles. Use tack cloth to remove dust and particles just prior to applying next coat.
I. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.
J. Use applicators and methods best suited for substrate and type of material being applied and according to manufacturer's instructions.
    1. Brush Application: Use brushes best suited for the type of material applied; use brush of appropriate size for the surface or item being painted; produce results free of visible brush marks.
    2. Roller Application: Use rollers of carpet, velvet back, or high-pile sheep's wool as recommended by manufacturer for material and texture required.
    3. Spray Application: Use airless spray equipment with orifice size as recommended by manufacturer for material and texture required.
K. Minimum Coating Thickness: Apply paint materials no thinner than manufacturer's recommended spreading rate; provide total dry film thickness of entire system as recommended by manufacturer.
    1. Number of coats and film thickness required are the same regardless of application method.
    2. If undercoats, stains, or other conditions show through final coat of paint, apply additional coats until paint film is of uniform finish, color, and appearance.
    3. Give special attention to ensure edges, corners, crevices, welds, and exposed fasteners receive dry film thickness equivalent to that of flat surfaces.
    4. Dark Colors and Deep Clear Colors: Regardless of number of coats specified, apply as many coats as necessary for complete hide.
L. Apply finish to completely cover surfaces with uniform appearance without brush marks, runs, sags, laps, ropiness, holidays, spotting, cloudiness, or other surface imperfections.
    1. Apply each coat of paint slightly darker than preceding coat unless otherwise approved.
    2. Before applying finish coats, apply a prime coat of material recommended by manufacturer, unless the surface has been prime coated by others; where evidence of suction spots or unsealed areas in first coat appear, recoat primed and sealed surfaces to ensure finish coat with no burn through or other defects due to insufficient sealing.
    3. Apply first coat to surface that has been cleaned, pretreated, or otherwise prepared as soon as practical after preparation and before subsequent surface deterioration.
    4. Do not apply succeeding coats until the previous coat has cured as recommended by manufacturer.
    5. Do not recoat until paint has dried to where it feels firm, does not deform or feel sticky under moderate thumb pressure, and application of another coat will not cause the undercoat to lift or lose adhesion.
    6. If manufacturer's instructions recommend sanding to produce a smooth, even surface, sand between coats.
    7. Before applying next coat vacuum clean surfaces of loose particles. Use tack cloth to remove dust and particles just prior to applying next coat.
    8. Pigmented (Opaque) Finishes: Provide smooth, opaque surface of uniform finish, color, appearance, and coverage.

3.04 FIELD QUALITY CONTROL

A. See Section 01 4000 - Quality Requirements, for general requirements for field inspection.
B. All surfaces, preparation and paint applications shall be inspected.
C. Manufacturer's Product Representative to provide field inspection and written certification of product application.
D. Painted exterior surfaces shall be considered to lack uniformity and soundness if any of the following defects are apparent to the Manufacturer's Product Representative and/or Architect:
    1. Brush/roller marks, streaks, laps, runs, sags, drips, heavy stippling, hiding or shadowing by inefficient application methods, skipped or missed areas, and foreign materials in paint coatings.
    2. Evidence of poor coverage at rivet heads, plated edges, lap joints, crevices, pockets, corners and re-entrant angles.
    3. Damage due to touching before paint is sufficiently dry or any other contributory cause.
    4. Damage due to application on moist surfaces or caused by inadequate protection from the weather.
    5. Damage and/or contamination of paint due to blown contaminants (dust, spray paint, etc.).
E. Painted surfaces shall be considered unacceptable if any of the following are evident under natural lighting source for exterior surfaces:
    1. Visible defects are evident on vertical surfaces when viewed at normal viewing angles from a distance of not less than 39 inches (1000 mm).
    2. Visible defects are evident on horizontal surfaces when viewed at normal viewing angles from a distance of not less than 39 inches (1000 mm).
    3. Visible defects are evident on ceiling, soffit and other overhead surfaces when viewed at normal viewing angles.
    4. When the final coat on any surface exhibits a lack of uniformity of color, sheen, texture, and hiding across full surface area.
F. Painted surfaces rejected by the Manufacturer's Product Representative and/or Architect shall be made good at the expense of the Contractor. Small affected areas may be touched up; large affected areas or areas without sufficient dry film thickness of paint shall be repainted. Runs and sags shall be removed by a scraper or by sanding prior to application of paint.

3.05 CLEANING

A. Collect waste material that could constitute a fire hazard, place in closed metal containers, and remove daily from site.
B. At the end of each workday, remove empty cans, rags, rubbish, and other discarded paint materials from site.

3.06 PROTECTION

A. Protect finishes until completion of project.
B. Protect other work, whether being painted or not, against damage by painting. Correct damage by cleaning, repairing or replacing, and repainting as approved by Architect.
C. Provide "Wet Paint" signs to protect newly painted finishes. Remove temporary protective wrappings provided by others to protect their work after completing painting operations.
D. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

END OF SECTION 09 9113

SECTION 09 9123

INTERIOR PAINTING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Furnish all labor, materials, equipment, tools and services required to fully complete all Interior Painting work as is indicated on the drawings and/or specified herein including, but not limited to, the following described items.
B. Surface preparation of substrates as required for acceptance of painting, including high pressure washing, abrasive blasting, cleaning, small crack repair, patching, and caulking.
C. Field application of paints.
D. Materials for backpriming woodwork.
E. Scope: Finish interior surfaces exposed to view, unless fully factory-finished and unless otherwise indicated, including the following:
    1. If a surface, material, or item is not specifically mentioned, paint in the same manner as similar surfaces, materials, or items, regardless of whether colors are indicated or not.
    2. Finish surfaces behind movable equipment and furnishings the same as similar exposed surfaces.
    3. Finish surfaces to be concealed behind permanently installed fixtures, equipment, and furnishings, using primer only, prior to installation of the permanent item.
    4. Finish semi-exposed structure, miscellaneous pipes, conduit, ducts, etc. visible through finished ceiling elements.
    5. Finish back sides of access panels and removable and hinged covers to match exposed surfaces.
    6. Both sides and edges of plywood backboards for electrical and telecom equipment before installing equipment.
    7. Elevator pit ladders.
    8. Prime surfaces to receive wall coverings.
F. 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. Tile Backer Board
    4. Items indicated to remain unfinished.
    5. Fire rating labels, equipment serial number and capacity labels, bar code labels, and operating parts of equipment.
    6. Stainless steel, anodized aluminum, bronze, terne-coated stainless steel, and lead items.
        a. Unless indicated
    7. Marble, granite, slate, and other natural stones.
    8. Floors, unless specifically indicated.
    9. Ceramic and other tiles.
    10. Brick, architectural concrete, cast stone, integrally colored plaster, and stucco.
    11. Glass.
    12. Concrete masonry units in utility, mechanical, and electrical spaces.
    13. Acoustical materials, unless specifically indicated.
    14. Concealed pipes, ducts, and conduits.

1.02 RELATED REQUIREMENTS

A. Section 09 9113 - Exterior Painting.
B. Section 09 9724 - Sealers - Interior Concrete, Precast and Masonry Sealers
C. Division 21 - Identification for Fire Suppression Piping and Equipment: Color coding scheme for items to be painted under this section.
D. Division 22 - Identification for Plumbing Piping and Equipment: Color coding scheme for items to be painted under this section.
E. Division 23 - Identification for HVAC Piping and Equipment: Color coding scheme for items to be painted under this section.
F. Division 26 - Identification for Electrical Systems: Color coding scheme for items to be painted under this section.
G. Section 32 1723 - Pavement Markings: Painted pavement markings.

1.03 DEFINITIONS

A. Comply with ASTM D16 for interpretation of terms used in this section.
B. Gloss Level 1: Not more than 5 units at 60 degrees and 10 units at 85 degrees, according to ASTM D523, a matte flat finish.
C. Gloss Level 2: Not more than 10 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D 523, a high-side sheen flat, velvet-like finish.
D. Gloss Level 3: 10 to 25 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D 523, an eggshell finish.
E. Gloss Level 4: 20 to 35 units at 60 degrees and not less than 35 units at 85 degrees, according to ASTM D 523, a satin-like finish.
F. Gloss Level 5: 35 to 70 units at 60 degrees, according to ASTM D 523, a semi-gloss finish.
G. Gloss Level 6: 70 to 85 units at 60 degrees, according to ASTM D 523, a gloss finish.

1.04 REFERENCE STANDARDS

A. 40 CFR 59, Subpart D - National Volatile Organic Compound Emission Standards for Architectural Coatings; U.S. Environmental Protection Agency; current edition.
B. ASTM D16 - Standard Terminology for Paint, Related Coatings, Materials, and Applications; 2019.
C. ASTM D4258 - Standard Practice for Surface Cleaning Concrete for Coating; 2005 (Reapproved 2017).
D. ASTM D4442 - Standard Test Methods for Direct Moisture Content Measurement of Wood and Wood-Based Materials; 2020.
E. ASTM D523 - Standard Test Method for Specular Gloss; 2014 (Reapproved 2018).
F. MPI (APSM) - Master Painters Institute Architectural Painting Specification Manual; Current Edition.
G. SSPC-SP 1 - Solvent Cleaning; 2015, with Editorial Revision (2016).
H. SSPC-SP 2 - Hand Tool Cleaning; 2018.
I. SSPC-SP 3 - Power Tool Cleaning; 2018.
J. SSPC-SP 13 - Surface Preparation of Concrete; 2018.

1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide complete list of products to be used, with the following information for each:
    1. Manufacturer's name, product name and/or catalog number, and general product category (e.g., "alkyd enamel").

2. Cross-reference to specified paint system(s) product is to be used in; include description of each system. Use same designations indicated on Drawings and in schedules.
3. Manufacturer's installation instructions.
4. Manufacturer's Instructions: Indicate special surface preparation procedures and substrate conditions requiring special attention.
5. Product characteristics.
6. Primer requirements and finish specification.
7. Storage and handling requirements and recommendations.
8. Application methods.
9. Cautions.

C. Selection Samples: Submit a complete set of color chips that represent the full range (including premium) of manufacturer's color samples available.
1. Allow 30 days for approval process, after receipt of complete samples by Architect.
2. Paint color submittals will not be considered until color submittals for major materials not to be painted, such as masonry, factory finished metals, wood doors, and casework, have been approved.
3. Where sheen is specified, submit samples in only that sheen.
4. Where sheen is not specified, discuss sheen options with Architect before preparing samples, to eliminate sheens definitely not required.
5. Within a reasonable amount of time after all color related submittals have been reviewed and accepted, the Architect will issue the "Color Schedule" for the project which will include all required paint color selections for the Contractors use.

D. Samples for Verification: For each type of paint system and in each color and gloss of topcoat.
1. Submit Samples on rigid backing, 8 inches (200 mm) square.
2. Step coats on Samples to show each coat required for system.
3. Label each coat of each Sample.
4. Label each Sample for location and application area.

E. Certification: By manufacturer that paints and finishes comply with VOC limits specified.

F. Manufacturer's Instructions: Indicate special surface preparation procedures and substrate conditions requiring special attention.

1.06 MAINTENANCE MATERIAL SUBMITTALS

A. Maintenance Data: Submit coating maintenance manual including finish schedule showing where each product/color/finish was used, product technical data sheets, material safety data sheets (MSDS), care and cleaning instructions, touch-up procedures, repair of painted and finished surfaces, and color samples of each color and finish used.

B. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
1. See Section 01 6000 - Product Requirements, for additional provisions.
2. Extra Paint and Finish Materials: 1 gallon of each color; from the same product run, store where directed.
3. Label each container with color, type, texture, and room locations in addition to the manufacturer's label.

1.07 QUALITY ASSURANCE

A. This Contractor shall have a minimum of five (5) years proven satisfactory experience and shall show proof before commencement of work that he will maintain a qualified crew of painters throughout the duration of the work. Contractor shall provide a list of the last three comparable jobs including, name and location, project manager, start/completion dates and value of painting work.

B. Material Safety Data Sheets: At project site maintain file of MSDS sheets for each product used; become familiar with and follow manufacturer's stated application and safety requirements.
C. All surfaces requiring painting/coating shall be inspected by the Painting/Coating Manufacturer's Product Representative who shall notify the Architect and General Contractor in writing of any defects or problems, prior to commencing painting work, or after the prime coat shows defects in the substrate. The Manufacturer's Product Representative shall provide a written certification of all surfaces and conditions for paint or coating system application as well as on site supervision, inspection and approval of the application.
D. The painting contractor shall receive written confirmation of the specific surface preparation procedures and primers used for all fabricated steel items from the fabricator/supplier to ascertain appropriate and manufacturer compatible finish coat materials to be used before painting any such work.
E. Manufacturer Qualifications: Company specializing in manufacturing the products specified, with minimum three years documented experience.
F. Applicator Qualifications: Company specializing in performing the type of work specified with minimum 3 years experience and approved by manufacturer.

1.08 MOCK-UP

A. See Section 01 4000 - Quality Requirements, for general requirements for mock-up.
B. Mockups: Apply mockups of each paint system indicated and each color and finish selected to verify preliminary selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
    1. Architect will select one surface to represent surfaces and conditions for application of each paint system specified in Part 3.
        a. Vertical and Horizontal Surfaces: Provide samples of at least 100 sq. ft. (9 sq. m).
        b. Other Items: Architect will designate items or areas required.
    2. Final approval of color selections will be based on mockups.
        a. If preliminary color selections are not approved, apply additional mockups of additional colors selected by Architect at no added cost to Owner.
    3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
    4. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.
C. Locate where directed by Architect.
D. Mock-up may remain as part of the work.

1.09 DELIVERY, STORAGE, AND HANDLING

A. Delivery and Handling: Deliver products to Project site in an undamaged condition in manufacturer's original sealed containers, complete with labels and instructions for handling, storing, unpacking, protecting, and installing. Packaging shall bear the manufacturer’s label with the following information:
    1. Product name and type (description).
    2. Batch date.
    3. Color number.
    4. VOC content.
    5. Environmental handling requirements.
    6. Surface preparation requirements.
    7. Application instructions.

B. Paint Materials: Store materials not in use in tightly covered containers in well-ventilated areas at minimum ambient temperature of 45 degrees F and a maximum of 90 degrees F, in ventilated area, and as required by manufacturer's instructions.
   1. Maintain containers in clean condition, free of foreign materials and residue.
   2. Remove rags and waste from storage areas daily.

1.10 FIELD CONDITIONS

A. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 95 deg F (10 and 35 deg C).
B. Follow manufacturer's recommended procedures for producing best results, including testing of substrates, moisture in substrates, and humidity and temperature limitations.
C. Do not apply materials when relative humidity exceeds 85 percent, at temperatures less than 5 degrees F above the dew point, or to damp or wet surfaces.
D. Provide lighting level of 80 ft candles measured mid-height at substrate surface.

1.11 GUARANTEE

A. This Contractor shall guarantee his work for a period of One (1) years from date of Substantial Completion. Guarantee shall be on form included in Section 01 7800.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Basis-of-Design Product: Subject to compliance with requirements, provide products indicated from one of the following:
   1. Sherwin-Williams.
   2. PPG Paints.
   3. Kelly Moore Paint Company, Inc
B. Provide paints and finishes from the same manufacturer to the greatest extent possible.
C. Substitutions: See Section 01 6000 - Product Requirements.

2.02 PAINTS AND FINISHES - GENERAL

A. Material Compatibility:
   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. Provide materials that are compatible with one another and the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.
   3. For opaque finishes, tint each coat including primer coat and intermediate coats, one-half shade lighter than succeeding coat, with final finish coat as base color.
   4. Supply each paint material in quantity required to complete entire project's work from a single production run.
   5. Do not reduce, thin, or dilute paint or finishes or add materials unless such procedure is specifically described in manufacturer's product instructions.
   6. For each coat in a paint system, provide products recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated.
B. VOC Content: Utah Administrative Code R307-361 Products shall comply with VOC limits of authorities having jurisdiction and, for interior and exterior paints and coatings applied at Project site, the following VOC limits, exclusive of colorants added to a tint base, when calculated according to 40 CFR 59, Subpart D (EPA Method 24)].
   1. Flat Paints and Coatings: 50 g/L.

2. Non flat Paints and Coatings: 100 g/L.
3. Dry-Fog Coatings: 150 g/L.
4. Primers, Sealers, and Undercoaters: 100 g/L.
5. Industrial maintenance Coatings Applied to Ferrous Metals: 250 g/L.
6. Zinc-Rich Industrial Maintenance Primers: 340 g/L.
7. Pretreatment Wash Primers: 420 g/L.
8. Floor Coatings Foot Traffic: 100 g/L.
9. Floor Coatings High Performance: 250 g/L.
10. Shellacs, Clear: 730 g/L.
11. Shellacs, Pigmented: 550 g/L.
12. Wood Coatings: 275 g/L.

C. Flammability: Comply with applicable code for surface burning characteristics.

D. Sheens: Provide the sheens specified; where sheen is not specified, sheen will be selected later by Architect from the manufacturer's full line.

E. Colors: To be selected from manufacturer's full range of available colors.
1. Selection to be made by Architect after award of contract.
2. Allow for minimum of three colors for each system, unless otherwise indicated, without additional cost to Owner.
3. Extend colors to surface edges; colors may change at any edge as directed by Architect.
4. In finished areas, finish pipes, ducts, conduit, and equipment the same color as the wall/ceiling under which they are mounted.
5. In utility areas, finish equipment, piping, conduit, and exposed duct work in colors according to the color coding scheme indicated.

2.03 PAINT SYSTEMS - INTERIOR

A. NOTE:
1. Refer to Section 03 3515 - Polished Concrete Finishing - for concrete floor sealers.
2. Refer to Section 07 1900 - Exterior Water Repellents and Graffiti Resistant Sealers for Exterior Sealers.
3. Refer to Section 09 9724 - Sealers - Interior Concrete, Precast and Masonry Sealers for Interior Sealers.
4. (Primers specified in painting schedules may be omitted on items that are factory primed or factory finished if acceptable to topcoat manufacturers.)

B. Concrete and Masonry - Walls: Acrylic, eggshell finish
1. Primer:
a. Product: S/W Loxon Concrete and Masonry Primer
b. Product: PPG 4-603 Perma-Crete Interior/Exterior Alkali Resistant Primer
2. 1st coat:
a. Product: S/W ProMar 200 Zero VOC Latex Eg-shel
b. Product: PPG Manor Hall Interior Paint 82-410 Series
3. 2nd coat:
a. Product: S/W ProMar 200 Zero VOC Latex Eg-shel
b. Product: PPG Manor Hall Interior Paint 82-410 Series

C. CMU - Walls: Acrylic, eggshell finish
For: Classrooms, offices, etc.
1. Filler:
a. Product: S/W PrepRite Block Filler.
b. Product: PPG 6-7 Speed-hide Int./Ext. Masonry Latex Block Filler
2. 1st coat:
a. Product: S/W ProMar 200 Zero VOC HP Latex Eg-shel B20 Series
b. Product: PPG Manor Hall Interior Paint 82-410 Series

3. 2nd coat:
    a. Product: ProMar 200 Zero VOC HP Latex Eg-shel B20 Series
    b. Product: PPG Manor Hall Interior Paint 82-410 Series

D. Concrete and CMU - Walls: Epoxy, semi-gloss finish.
For: Restrooms, Locker rooms, Kitchen, Gyms, Cafeteria, Hallways and Custodial.
1. Primer:
    a. Product: S/W Loxon Block Surfacer
    b. Product: PPG 4-100XI Perma Create Concrete Masonry Surfacer/Filler
2. 1st coat:
    a. Product: S/W Pro Industrial Pre-catalyzed Water-Based Epoxy
    b. Product: PPG Pitt Glaze WB1 Interior Pre-Catalyzed Semi-Gloss (16-510)
3. 2nd coat:
    a. Product: S/W Pro Industrial Pre-catalyzed Water-Based Epoxy
    b. Product: PPG Pitt Glaze WB1 Interior Pre-Catalyzed Semi-Gloss (16-510)

E. Gypsum - ceilings and soffits: Acrylic, flat finish
For: Classrooms, offices, etc.
1. Primer:
    a. Product: S/W ProMar 200 Zero VOC Interior Latex Primer
    b. Product: PPG 6-4900XI Speed-hide Zero VOC Interior High Solids Latex Primer
2. 1st coat:
    a. Product: S/W ProMar 200 Zero VOC Interior Latex Flat
    b. Product: PPG 6-4110XI SPEEDHIDE ZERO Int. Zero VOC Commercial Latex Flat
3. 2nd coat:
    a. Product: S/W ProMar 200 Zero VOC Interior Latex Flat
    b. Product: PPG 6-4110XI SPEEDHIDE ZERO Int. Zero VOC Commercial Latex Flat

F. Gypsum - walls: Acrylic, eggshell finish
For: Classrooms, offices, etc.
1. Primer:
    a. Product: S/W ProMar 200 Zero VOC Interior Latex Primer
    b. Product: PPG 6-4900XI Speed-hide Zero VOC Interior High Solids Latex Primer
2. 1st coat:
    a. Product: S/W ProMar 200 Zero VOC HP Latex Eg-shel B20 Series
    b. Product: PPG Manor Hall Interior Paint 82-410 Series
3. 2nd coat:
    a. Product: ProMar 200 Zero VOC HP Latex Eg-shel B20 Series
    b. Product: PPG Manor Hall Interior Paint 82-410 Series

G. Gypsum - walls and ceilings: Epoxy, semi-gloss finish.
For: Restrooms, Locker rooms, Kitchen, Gyms, Cafeteria, Hallways and Custodial.
1. Primer:
    a. Product: S/W ProMar 200 Zero VOC Interior Latex Primer
    b. Product: PPG 6-4900XI Speed-hide Zero VOC Interior High Solids Latex Primer
2. 1st coat:
    a. Product: S/W Pro Industrial Pre-catalyzed Water-Based Epoxy
    b. Product: PPG Pitt Glaze WB1 Interior Pre-Catalyzed Semi-Gloss (16-510)
3. 2nd coat:
    a. Product: S/W Pro Industrial Pre-catalyzed Water-Based Epoxy
    b. Product: PPG Pitt Glaze WB1 Interior Pre-Catalyzed Semi-Gloss (16-510)

H. Wood - stained: polyurethane, satin finish
1. Stain:
    a. Product: S/W Wood classics 250
    b. Product: PPG Deft 570 Series Fast Dry Oil Stain

2. 1st coat:
    a. Product: S/W Wood classics waterborne polyurethane satin
    b. Product: PPG Deft 159 interior Water based Polyurethane Satin
3. 2nd coat:
    a. Product: S/W Wood classics waterborne polyurethane satin
    b. Product: PPG Deft 159 interior Water based Polyurethane Satin

I. Ferrous Metal: Epoxy Semi-Gloss Finish

HM Doors, Frames and miscellaneous metals

1. Primer:
    a. Product: S/W Pro industrial Pro-Cryl Universal Metal Primer
    b. Product: PPG 4020 Pitt-Tech Interior/Exterior Primer Finish DTM Industrial Enamel
2. 1st coat:
    a. Product: S/W Pro Industrial Pre-catalyzed Water-Based Epoxy
    b. Product: PPG Pitt Glaze WB1 Interior Pre-Catalyzed Semi-Gloss (16-510)
3. 2nd coat:
    a. Product: S/W Pro Industrial Pre-catalyzed Water-Based Epoxy
    b. Product: PPG Pitt Glaze WB1 Interior Pre-Catalyzed Semi-Gloss (16-510)

J. Ferrous Metal: Semi-Gloss Finish

Hand Rails

1. Primer:
    a. Product: S/W Recoatable Epoxy Primer
    b. Product: PPG Americoat 385 Epoxy Primer
2. 1st coat:
    a. Product: S/W Hi Solids Polyurethane B65 Series
    b. Product: PPG Pitthane Ultra Gloss 95-812
3. 2nd coat:
    a. Product: S/W Hi Solids Polyurethane B65 Series
    b. Product: PPG Pitthane Ultra Gloss 95-812

K. Non-Ferrous Metal

1. Primer:
    a. Product: S/W Pro industrial Pro-Cryl Universal Metal Primer
    b. Product: PPG 4020 Pitt-Tech Plus Interior/Exterior Primer Finish DTM Industrial Enamel
2. 1st coat:
    a. Product: S/W Pro Industrial Acrylic Semi-gloss
    b. Product: PPG 4216 Pitt Tech Plus DTM Acrylic Semi-Gloss Finish
3. 2nd coat:
    a. Product: S/W Pro Industrial Acrylic Semi-gloss
    b. Product: PPG 4216 Pitt Tech Plus DTM Acrylic Semi-Gloss Finish

L. Exposed Ceilings: Acrylic Dryfall Flat Finish

To include: Structural Steel, Metal Deck, Pipes, Ducts, Catwalks, Ladders, Railings, Etc.

1. Primer:
    a. Product: S/W Pro industrial Pro-Cryl Universal Metal Primer
    b. Product: PPG 4020 Pitt-Tech Plus Interior/Exterior Primer Finish DTM Industrial Enamel
2. 1st coat:
    a. Product: S/W Pro Industrial Waterborne Acrylic Dryfall
    b. Product: PPG 6-725XI Speed-hide Supertech Interior Flat White Dryfall
3. 2nd coat:
    a. Product: S/W Pro Industrial Waterborne Acrylic Dryfall
    b. Product: PPG 6-725XI Speed-hide Supertech Interior Flat White Dryfall

M. Acoustic Panels: Acrylic Dryfall, flat finish
   For: Cementitious wood fiber acoustical panels
   1. 1st coat:
      a. Product: S/W Pro Industrial Waterborne Acrylic Dryfall
      b. Product: PPG 6-725XI Speed-hide Supertech Interior Flat White Dryfall
   2. 2nd coat:
      a. Product: S/W Pro Industrial Waterborne Acrylic Dryfall
      b. Product: PPG 6-725XI Speed-hide Supertech Interior Flat White Dryfall

N. Exposed Epoxy Painted Concrete Floors (noted as F4 in the Floor Finish Schedule):
   1. Primer: Type recommended by flooring manufacturer for substrate and flooring system indicated.
   2. 1st Coat:
      a. Product: S/W ArmorSeal® Floor-Plex 8100, B70-8100 Series (2.0 - 4.0 mils dry per coat)
      b. Product: PPG Aquapon WB-EP Water-Borne Epoxy 98E-1 (2.0 - 4.0 mils dry per coat)
   3. 2nd Coat:
      a. Product: S/W ArmorSeal® Floor-Plex 8100, B70-8100 Series (2.0 - 4.0 mils dry per coat)
      b. Product: PPG Aquapon WB-EP Water-Borne Epoxy 98E-1, 2.0-3.0 mils/dft. with non-skid additive. (2.0 - 4.0 mils dry per coat)
   4. Concrete must age 30 days prior to application.
   5. Muriatic acid etching prior to application.

2.04 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.

2.05 SOURCE QUALITY CONTROL

A. Testing of Paint Materials: Owner reserves the right to invoke the following procedure:
   1. Owner will engage the services of a qualified testing agency to sample paint materials. Contractor will be notified in advance and may be present when samples are taken. If paint materials have already been delivered to Project site, samples may be taken at Project site. Samples will be identified, sealed, and certified by testing agency.
   2. Testing agency will perform tests for compliance with product requirements.
   3. Owner may direct Contractor to stop applying coatings if test results show materials being used do not comply with product requirements. Contractor shall remove noncomplying paint materials from Project site, pay for testing, and repaint surfaces painted with rejected materials. Contractor will be required to remove rejected materials from previously painted surfaces if, on repainting with complying materials, the two paints are incompatible.

PART 3 EXECUTION

3.01 EXAMINATION

A. Do not begin application of paints and finishes until substrates have been adequately prepared.
B. Verify that surfaces are ready to receive work as instructed by the product manufacturer.

C. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers. Where acceptability of substrate conditions is in question, apply samples and perform in-situ testing to verify compatibility, adhesion, and film integrity of new paint application.
   1. Report, in writing, conditions that may affect application, appearance, or performance of paint.

D. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially affect proper application.
   1. Gypsum Board Substrates: Verify that finishing compound is sanded smooth.
   2. Plaster Substrates: Verify that plaster is fully cured.
   3. Spray-Textured Ceiling Substrates: Verify that surfaces are dry.

E. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

F. Test shop-applied primer for compatibility with subsequent cover materials.

G. Measure moisture content of surfaces using an electronic moisture meter. Do not apply finishes unless moisture content of surfaces is below the following maximums:
   1. Gypsum Wallboard: 12 percent.
   2. Plaster and Stucco: 12 percent.
   3. Masonry, Concrete, and Concrete Masonry Units: 12 percent.
   4. Interior Wood: 15 percent, measured in accordance with ASTM D4442.
   5. 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. Concrete:
   1. Remove release agents, curing compounds, efflorescence, and chalk. Do not coat surfaces if moisture content or alkalinity of surfaces to be coated exceeds that permitted in manufacturer's written instructions.
   2. Clean surfaces with pressurized water. Use pressure range of 1,500 to 4,000 psi at 6 to 12 inches. Allow to dry.
   3. Clean concrete according to ASTM D4258. Allow to dry.
   4. Prepare surface as recommended by top coat manufacturer and according to SSPC-SP 13.

F. Masonry:
   1. Remove efflorescence and chalk. Do not coat surfaces if moisture content, alkalinity of surfaces, or if alkalinity of mortar joints exceed that permitted in manufacturer's written instructions. Allow to dry.
   2. Prepare surface as recommended by top coat manufacturer.
   3. Clean surfaces with pressurized water. Use pressure range of 600 to 1,500 psi at 6 to 12 inches. Allow to dry.

G. 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.

H. Gypsum Board: Fill minor defects with filler compound. Spot prime defects after repair.

I. Plaster: Fill hairline cracks, small holes, and imperfections with latex patching plaster. Make smooth and flush with adjacent surfaces. Wash and neutralize high alkali surfaces.

J. Insulated Coverings: Remove dirt, grease, and oil from canvas and cotton.
K. Aluminum: Remove surface contamination and oils and wash with solvent according to SSPC-SP 1.
L. Galvanized Surfaces:
    1. Remove surface contamination and oils and wash with solvent according to SSPC-SP 1.
    2. Prepare surface according to SSPC-SP 2.
M. Ferrous Metal:
    1. Solvent clean according to SSPC-SP 1.
    2. Shop-Primed Surfaces: Sand and scrape to remove loose primer and rust. Feather edges to make touch-up patches inconspicuous. Clean surfaces with solvent. Prime bare steel surfaces. Re-prime entire shop-primed item.
    3. Steel Substrates: Remove rust, loose mill scale, and shop primer, if any. Clean using methods recommended in writing by paint manufacturer but not less than the following:
        a. SSPC-SP 2, "Hand Tool Cleaning."
        b. SSPC-SP 3, "Power Tool Cleaning."
        c. SSPC-SP 11, "Power Tool Cleaning to Bare Metal."
N. Galvanized-Metal Substrates: Remove grease and oil residue from galvanized sheet metal fabricated from coil stock by mechanical methods to produce clean, lightly etched surfaces that promote adhesion of subsequently applied paints.
O. Aluminum Substrates: Remove loose surface oxidation.
P. Wood Surfaces to Receive Opaque Finish:
    1. Wipe off dust and grit prior to priming.
    2. Seal knots, pitch streaks, and sappy sections with sealer.
    3. Fill nail holes and cracks after primer has dried;
    4. Sand between coats.
    5. Back prime concealed surfaces before installation.
Q. Glue-Laminated Beams: Prior to finishing, wash surfaces with solvent, remove grease and dirt.
R. Wood Doors to be Field-Finished: Seal wood door top and bottom edge surfaces with clear sealer.
S. Metal Doors to be Painted: Prime metal door top and bottom edge surfaces.
T. Cotton or Canvas Insulation Covering Substrates: Remove dust, dirt, and other foreign material that might impair bond of paints to substrates.

3.03 APPLICATION

A. Remove unfinished louvers, grilles, covers, and access panels on mechanical and electrical components and paint separately.
B. Apply products in accordance with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual".
    1. Use applicators and techniques suited for paint and substrate indicated.
    2. Paint surfaces behind movable equipment and furniture same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed equipment or furniture with prime coat only.
    3. Paint front and backsides of access panels, removable or hinged covers, and similar hinged items to match exposed surfaces.
    4. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
    5. Primers specified in painting schedules may be omitted on items that are factory primed or factory finished if acceptable to topcoat manufacturers.
C. Where adjacent sealant is to be painted, do not apply finish coats until sealant is applied.
D. Do not apply finishes to surfaces that are not dry. Allow applied coats to dry before next coat is applied.

E. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.
   1. Tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of same material are to be applied. Tint undercoats to match color of topcoat, but provide sufficient difference in shade of undercoats to distinguish each separate coat.
   2. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.

F. Dark Colors and Deep Clear Colors: Regardless of number of coats specified, apply as many coats as necessary for complete hide.

G. Sand wood and metal surfaces lightly between coats to achieve required finish.

H. Vacuum clean surfaces of loose particles. Use tack cloth to remove dust and particles just prior to applying next coat.

I. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.

3.04 FIELD QUALITY CONTROL

A. See Section 01 4000 - Quality Requirements, for general requirements for field inspection.

B. Dry Film Thickness Testing: Owner may engage the services of a qualified testing and inspecting agency to inspect and test paint for dry film thickness.
   1. Contractor shall touch up and restore painted surfaces damaged by testing.
   2. If test results show that dry film thickness of applied paint does not comply with paint manufacturer's written recommendations, Contractor shall pay for testing and apply additional coats as needed to provide dry film thickness that complies with paint manufacturer's written recommendations.

3.05 CLEANING

A. Collect waste material that could constitute a fire hazard, place in closed metal containers, and remove daily from site.

B. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.

3.06 PROTECTION

A. Protect finishes until completion of project.

B. Touch-up damaged finishes after Substantial Completion.

END OF SECTION 09 9123

SECTION 09 9724

SEALERS - INTERIOR CONCRETE, PRECAST AND MASONRY SEALERS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Furnish all labor, materials, equipment, tools and services required to fully complete all Interior Concrete and Masonry Finish work as is indicated on the drawings and/or specified herein including, but not limited to, the following items.
B. Sealer applied to new interior masonry and concrete walls.
C. Sealer applied to new interior pre-cast architectural concrete (benches, sills, caps, etc.).
D. Surface preparation.
E. Do not include sales tax, refer to Section 00 1115 - Advertisement for Prequalification of Bidders

1.02 RELATED REQUIREMENTS

A. Section 03 4500 - Pre-cast Architectural Concrete.
B. Section 04 2001 - Masonry Veneer.
C. Section 04 2731 - Reinforced Unit Masonry.
D. Section 07 9200 - Joint Sealants

1.03 REFERENCE STANDARDS

A. ASTM C39/C39M - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens; 2010.
B. ASTM C779/C779M - Standard Test Method for Abrasion Resistance of Horizontal Concrete Surfaces; 2010.
C. ASTM C805/C805M - Standard Test Method for Rebound Number of Hardened Concrete; 2008.
D. ASTM C1028 - Standard Test Method for Determining the Static Coefficient of Friction of Ceramic Tile and Other Like Surfaces by the Horizontal Dynamometer Pull-Meter Method; 2007e1.
E. ASTM D3359 - Standard Test Methods for Measuring Adhesion by Tape Test; 2009e2.
F. ASTM D3960 - Standard Practice for Determining Volatile Organic Compound (VOC) Content of Paints and Related Coatings; 2005.
G. ASTM D5095 - Standard Test Method for Determination of the Nonvolatile Content in Silanes, Siloxanes, and Silane-Siloxane Blends Used in Masonry Water Repellent Treatments; 2007.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene a meeting at least one week prior to starting work; require attendance of affected installers; invite Architect andMurray City School District .

1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide product description, details of tests performed, limitations, and chemical composition.
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. 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 Sealer Material: Two gallons of the type installed.

1.06 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum five years documented experience.
B. Installer Qualifications: Company specializing in performing the work of this section with minimum five years experience and approved by the manufacturer.
C. Murray City School District reserves the right to provide continuous independent inspection of surface preparation and application of sealer.

1.07 MOCK-UP

A. Masonry Walls: Prepare a representative surface 36 x 36 inch in size of Sealed Masonry Wall using specified materials and preparation and application methods on surfaces identical to those to be coated; approved mock-up constitutes standard for workmanship.
B. Concrete Floors: Prepare a representative surface 72 x 72 inch in size of Dyed and Sealed Concrete Floor using specified materials and preparation and application methods on surfaces identical to those to be coated; approved mock-up constitutes standard for workmanship.
   1. Mockup shall be dyed and densified by the individual workers who will actually be performing the Work.
   2. Obtain written approval of the mockup.
C. Locate where directed.
D. Mockup may remain as part of the Work, if undisturbed at time of Substantial Completion at the discretion of the Architect.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in manufacturer's sealed packaging, including application instructions.
B. Store materials protected from exposure to harmful environmental conditions and at temperature and humidity conditions recommended by the manufacturer

1.09 FIELD CONDITIONS

A. Maintain ambient temperature of between 50 and 90 degrees F (10 and 32 degrees C) during application and at least 48 hours after application.
B. Precautions shall be taken to avoid damage or contamination of any surfaces near the work zone. Protect completed dye work from moisture or contamination.

1.10 WARRANTY

A. Provide 5 year written guarantee on installation by sealer installer accompanied by written certification from Sealer Manufacturer verifying Manufacturer's installation requirements have been met. Guarantee shall cover defects in workmanship and include statement that sealer installer shall, at no additional expense to Owner and upon written notice from Owner, promptly correct or replace improper work and material that may become apparent within 60 months after date of final completion. Installer shall complete corrective work within 15 days of receipt of Owner's written notice unless other arrangements are made in writing with Owner. Installer's Guarantee shall be in form given in Section 01 7800.

B. Manufacturer shall provide a writteen warranty that warrants respective products applied in accordance with manufacturer's specifications for a period of 5 years from date of Substantial Completion, against water intrusion due to material failure. When notified of such conditions, in writing, by the Owner, the manufacturer shall provide materials, and the applicator shall provide the labor to correct said deficiencies promptly and without inconvenience or cost to the Owner.

PART 2 PRODUCTS

2.01 MATERIALS - GENERAL

A. Volatile Organic Compound (VOC) Content:
   1. Provide coatings that comply with the most stringent requirements specified in the following:
      a. 40 CFR 59, Subpart D--National Volatile Organic Compound Emission Standards for Architectural Coatings.
      b. Ozone Transport Commission (OTC) Model Rule, Architectural, Industrial, and Maintenance Coatings; www.otcair.org; specifically:
         1) Opaque, Flat: 50 g/L, maximum.
         2) Opaque, Nonflat: 150 g/L, maximum.
         3) Opaque, High Gloss: 250 g/L, maximum.
         4) Varnishes: 350 g/L, maximum.
      c. Architectural coatings VOC limits of State in which the project is located.
   2. Determination of VOC Content: Testing and calculation in accordance with 40 CFR 59, Subpart D (EPA Method 24), exclusive of colorants added to a tint base and water added at project site; or other method acceptable to authorities having jurisdiction.

B. Chemical Content: The following compounds are prohibited:
   1. Aromatic Compounds: In excess of 1.0 percent by weight of total aromatic compounds (hydrocarbon compounds containing one or more benzene rings).
   2. Acrolein, acrylonitrile, antimony, benzene, butyl benzyl phthalate, cadmium, di (2-ethylhexyl) phthalate, di-n-butyl phthalate, di-n-octyl phthalate, 1,2-dichlorobenzene, diethyl phthalate., dimethyl phthalate, ethylbenzene, formaldehyde, hexavalent chromium, isophorone, lead, mercury, methyl ethyl ketone, methyl isobutyl ketone, methylene chloride, naphthalene, toluene (methylbenzene), 1,1,1-trichloroethane, vinyl chloride.

C. Provide materials that are compatible with one another and the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.

D. Accessory Materials: Materials not specifically indicated but required to achieve the finishes specified; commercial quality.

2.02 INTERIOR MASONRY AND PRE-CAST ARCHITECTURAL CONCRETE SEALER

A. Low Sheen Sealer
   1. Manufacturers:
      a. Okon, Inc.; Product - "OKON S-40": www.okoninc.com.
      b. BASF Building Systems; Product - MasterProtect H 185: www.buildingsystems.basf.com.
      c. Evonik Industries (formerly Degussa); Product - "Protectosil Aqua-trete SG": www.evonik.com.
      d. Substitutions: See Section 01 6000 - Product Requirements.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.
B. Verify joint sealants are installed and cured.
C. Verify surfaces to be coated are dry, clean, and free of efflorescence, oil, or other matter detrimental to application of sealer.
    1. Unit Masonry: Below 12 percent.
    2. Concrete: Below 8 percent.

3.02 PREPARATION

A. Protection of Adjacent Work:
    1. Protect adjacent surfaces not intended to receive sealers.
B. Prepare surfaces to be coated as recommended by manufacturer for best results.
C. Do not start work until masonry mortar substrate or concrete is cured a minimum of 60 days.
D. Remove loose particles and foreign matter.
E. Remove oil and foreign substances with a chemical solvent that will not affect sealer.
F. Scrub and rinse surfaces with water and let dry.
G. Allow surfaces to dry completely to degree recommended by manufacturer before starting coating work.

3.03 MASONRY AND CONCRETE SEALER APPLICATION

A. Apply sealer in accordance with manufacturer's instructions, using procedures and application methods recommended for best results.
B. Apply at rate recommended by manufacturer, continuously over entire surface.
C. Remove sealer from unintended surfaces immediately by a method instructed by sealer manufacturer.
D. Provide manufacturer's field service representative to inspect preparation and application work for at least 3 hours on first day to ensure that manufacturer's "best practices" for preparation and application are being followed.

3.04 CLEANING AND PROTECTION

A. Collect waste material which may constitute a fire hazard, place in closed metal containers, and remove daily from site.
B. At the end of each workday, remove empty cans, rags, rubbish, and other discarded sealer materials from site.
C. Protect other work against damaged. Correct damage by cleaning, repairing or replacing, and repainting as approved by Architect.
D. Provide "Wet Paint" signs to protect newly sealed finishes. Remove temporary protective wrappings provided by others to protect their work after completing painting operations.
E. At completion of construction activities of other trades, touch up and restore damaged or defaced surfaces.

END OF SECTION 09 9724

SECTION 10 1100

VISUAL DISPLAY UNITS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Furnish all labor, materials, equipment, tools and services required to fully complete all Visual Display Board work as is indicated on the drawings and/or specified herein including, but not limited to, the following described items.
B. Markerboards and Tackboards.
C. Do not include sales tax, refer to Section 00 0102 - Notice to Contractors.

1.02 RELATED REQUIREMENTS

A. Section 09 2116 - Gypsum Board Assemblies: Concealed supports in metal stud walls.

1.03 REFERENCE STANDARDS

A. ASTM A424/A424M - Standard Specification for Steel, Sheet, for Porcelain Enameling; 2018.
B. ASTM C208 - Standard Specification for Cellulosic Fiber Insulating Board; 2022.
C. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2021a.

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 6 x 6 inch in size illustrating materials and finish, color and texture of markerboard, tackboard, and trim.
E. Test Reports: Show conformance to specified surface burning characteristics requirements.
F. Manufacturer's printed installation instructions.
G. Maintenance Data: Include data on regular cleaning and stain removal .

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum five years documented experience.

1.06 WARRANTY

A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
B. Provide five year 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:
   1. ADP Lemco, Inc: www.adplemco.com.
   2. Claridge Products and Equipment, Inc.: www. claridgeproducts.com.
   3. MooreCo, Inc.: www.moorecoinc.com.
   4. Nelson Adams NACO: www.nelsonadamsnaco.com.
   5. Polyvision Corporation: www.polyvision.com.

6. Platinum Visual System: www.pvusa.com.
7. AJW Architectural Products: https://ajw.com.
8. Substitutions: See Section 01 6000 - Product Requirements.

2.02 VISUAL DISPLAY BOARDS

A. Fixed Markerboards: Porcelain enamel on steel, laminated to core.
   1. Color: White.
   2. Metal Face Sheet Thickness: 0.024 inch (24 gage).
   3. Core: Medium Density Fiberboard, 1/2 inch thick, laminated to face sheet.
   4. Backing: Aluminum sheet, laminated to core.
   5. Sizes: As indicated on drawings.
   6. Frame: Extruded aluminum , with concealed fasteners.
   7. Frame Trim: 5/8 inch (16 mm) exposed face.
   8. Frame Finish: Satin Anodized natural.
   9. Accessories: Provide marker tray, marker tray, and marker tray.

B. Sliding Marker Boards: Porcelain enamel on steel, laminated to core.
   1. Color: White.
   2. Metal Face Sheet Thickness: 0.024 inch, 24 gage (0.61 mm).
   3. Core: Medium Density Fiberboard, manufacturer's standard thickness, laminated to face sheet.
   4. Backing: Aluminum sheet, laminated to core.
   5. Size: As indicated on drawings.
   6. Frame: Extruded aluminum , with concealed fasteners.
   7. Frame Profile: Manufacturer's standard.
   8. Frame Finish: Satin Anodized, natural.
   9. Slider Hardware: Nylon wheel carriers with roller glides at the bottom.
   10. Accessories: Provide map rail, flag holder, and marker tray.
   11. Provide music staves where indicated.
   12. Cork Thickness: 1/8 inch.
   13. Fabric: Vinyl coated fabric, Class A fire rated.
   14. Backing: Medium Density Fiberboard, 1/4 inch thick, laminated to tack surface.
   15. Surface Burning Characteristics: Flame spread index of 25, maximum, and smoke developed index of 450, maximum, when tested in accordance with ASTM E84.
   16. Size: As indicated on drawings.
   17. Frame: Extruded aluminum, with concealed fasteners.
   18. Frame Trim: 5/8 inch (16 mm) exposed face.
   19. Accessories: Provide map rail.

2.03 MATERIALS

A. Porcelain Enameled Steel Sheet: ASTM A424, Type I, Commercial Steel, with fired-on vitreous finish.

B. Vinyl-Coated Fabric: Type II roll stock, conforming to the following:
   1. Total Weight: 21 oz/sq yd.
   2. Color: As selected by Architect from Manufacturer's full line.
   3. Pattern: As selected by Architect from Manufacturer's full line.
   4. Overcoating: Stain resistant polyvinyl fluoride, 0.0005 inch thick.

C. Medium Density Fiberboard: ASTM C208, cellulosic fiber board.

D. Aluminum Sheet Backing: 0.015 inch thick.

E. 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 wide overall , full width of frame.
B. Map Supports: Formed aluminum sliding hooks and roller brackets to fit map rail.
C. Flag Holders: Cast aluminum bored to receive 1 inch diameter flag staff, bracketed to fit top rail of board. One per classroom.
D. Cleaning Instruction Plate: Provide instructions for chalkboard cleaning on a metal plate fastened to perimeter frame near marker tray.
E. Marker Tray: Aluminum, manufacturer's standard profile one piece full length of chalkboard, closed 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 on shop drawings.
B. Verify that internal wall blocking is ready to receive work and positioning dimensions are as indicated on shop drawings.

3.02 INSTALLATION

A. Install boards in accordance with manufacturer's instructions.
B. Install with bottom of perimeter frame at 30 inches above finished floor.
C. Secure units level and plumb.
D. Butt Joints: Install with tight hairline joints.

3.03 CLEANING

A. Clean board surfaces in accordance with manufacturer's instructions.
B. Remove temporary protective cover at date of Substantial Completion.

3.04 SCHEDULE - REFER TO DRAWINGS

This page intentionally left blank

SECTION 10 1400

BUILDING AND SITE SIGNAGE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Furnish all labor, materials, equipment, tools and services required to fully complete all Building Signage work as is indicated on the drawings and/or specified herein including, but not limited to, the following described items.
B. Interior acrylic signage.
C. Exterior aluminum signage.
D. Dedication plaque.
E. Interior / exterior aluminum letter signage.
F. Custom cut vinyl letter signage.
G. Site Signage (refer to civil drawings for locations and additional information).
H. Do not include sales tax, refer to Section 00 0104 - Notice to Contractors.

1.02 RELATED REQUIREMENTS

A. Section 07 4264 - Metal Composite Wall and Soffit Panels, Building Identification Signage
B. Division 22 - Identification for Plumbing Piping and Equipment.
C. Division 26 - Identification for Electrical Systems.
D. Section 26 5100 - Interior Lighting: Exit signs required by code.

1.03 REFERENCE STANDARDS

A. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design 2010.
B. ASTM D1929 - Standard Test Method for Determining Ignition Temperature of Plastics 2016.
C. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials 2020.
D. ICC A117.1 - Accessible and Usable Buildings and Facilities 2017.
E. ASTM E2072 - Standard Specification for Photoluminescent (Phosphorescent) Safety Markings 2014.
F. UL 1994 - Luminous Egress Path Marking Systems Current Edition, Including All Revisions.
G. UL 723 - Standard for Test for Surface Burning Characteristics of Building Materials Current Edition, Including All Revisions.
H. UL 94 - Tests for Flammability of Plastic Materials for Parts in Devices and Appliances Current Edition, Including All Revisions.

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. Verification Samples: Submit samples showing colors specified.
G. Manufacturer's Installation Instructions: Include installation templates and attachment devices.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum five 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.

1.08 GUARANTEE

A. The Contractor shall guarantee his work for a period of One (1) years from date of Substantial Completion. Guarantee shall be on form included in Section 01 7800.
B. Manufacturer shall provide 2 year warranty against material and manufacturing defects.

PART 2 PRODUCTS

2.01 INTERIOR ACRYLIC SIGNAGE

A. Interior Acrylic Signage:
    1. Acrylic signs shall consist of a back panel, and raised letters.
        a. Back Panel
            1) Panel thickness shall be .25 inch minimum. (1) piece of material.
            2) Color: As selected by Architect from manufacturer’s full line of colors.
                (a) Material shall be through color.
        b. Raised Letters
            1) Panel thickness shall be 0.0312 inch (0.8 mm).
            2) Finish: Matte non-glare
            3) Color: As selected by Architect from manufacturer’s full line of colors.
                (a) Material shall be through color.
            4) Font: Helvetica
        c. Braille
            1) Finish: Matte non-glare
            2) Color: As selected by Architect from manufacturer’s full line of colors.
            3) Type: Grade II Braille
        d. Corners: Square
        e. Mounting: Tape adhesive- 3M RP45 VHB Tape
            1) Glass mounting: provide graphic film on glass same size as sign to obscure mounting tape from opposite side. Gerber 220 series graphic film or equal.
    2. Signage Types:

a. Signs with window:
1) Text Placement: As indicated on the drawings.
2) Size: As indicated on the drawings.
3) Integral window:
(a) Size and placement as indicated on drawings.
(b) Clear acrylic window shall be routed into back panel with slot for card stock.
4) Context of Text: Refer to Signage drawings.
b. Static Signs:
1) Text/Pictogram Placement: As indicated on the drawings.
2) Size: As indicated on the drawings.
3. Sign Locations:
a. Refer to signage drawings.

B. Exterior Building Signage:
1. All signs are required to comply with ADAAG and ANSI/ICC A 117.1 and applicable building codes, unless otherwise indicated; in the event of conflicting requirements, comply with the most comprehensive and specific requirements.

C. Materials:
1. Exterior Metal Panels:
a. Panel Construction: 0.3125 inch aluminum panel.
b. Corner Condition: Round 1/2 inch (13 mm) diameter corner.
c. Mounting - Concealed Mount: Provide sign panel that includes a backing plate mounted to substrate with stainless steel, galvanized steel or chrome plated mechanical fasteners. Sign panel shall be adhered flush to the backing plate with factory applied VHB double-sided foam tape.

D. Signage Types:
1. Building Signage:
a. Context of Text/Pictograms: Exact verbiage/pictograms will be supplied at time of shop drawing submittal. Contractor shall coordinate with Owner/Architect.
b. Locations: As shown on drawings.

E. Finishes:
1. Panel: One (1) coat of metal primer and two (2) coats of synthetic automotive enamel.
a. Colors: As selected by Architect.
2. Text and Graphics: Two (2) coats of bulletin paint.
a. Font: ADA approved font as selected by Architect from manufacturer's full range.
b. White.

2.02 DEDICATION PLAQUE

A. General:
1. Provide unit free of pits, scale, sand, holes, and other defects, with specified raised letters, numbers, and characters.
2. Hand tool and buff to provide clean, sharp figures with bright finish.

B. Size: 36 inches (915 mm) wide by 24 inches (610 mm) high, verify with Architect

C. Material:
1. Aluminum alloy 5052, 3/8 inch (9.5 mm) thick.
2. Conform to industry standards for metal.

D. Letters:
1. Style: Raised, font to be selected by Architect.
2. Sizes: As selected by Manufacturer and approved by Architect.
3. Finish: Satin polished.

E. Border: Single line bevel.

F. Background:

1. Texture: Leatherette.
2. Color: As selected by Architect from Manufacturer's full color line.

G. Finish: Two (2) coats of clear metal lacquer, and then finished with protective coating.
H. Mounting: Bosses on back to be drilled and tapped for threaded stud for a concealed mounting.
I. Context of Text:
   1. Exact verbiage and design will be supplied at time of shop drawing submittal. Contractor shall coordinate with Owner/Architect. Changes made by the Owner/Architect during submittal process shall Not be grounds for Change Order or Increase in Price.
J. MANUFACTURERS
   1. Southwell Co: www.southwellco.com.
   2. Metal Arts: www.metalarts.net.
   3. R.K. Ramos Signage Systems: www.arkramous.com.
   4. Gemini Incorporated: www.geminisignletters.com.
   5. Metallic Arts: www.metallicarts.com.
   6. Substitutions: See Section 01 6000 - Product Requirements.

2.03 INTERIOR / EXTERIOR ALUMINUM LETTER SIGNAGE

A. 0.25 inch aluminum plate.
B. Letters:
   1. Font: As selected by Architect.
   2. Height and spacing: refer to drawings.
C. Finish:
   1. Powder Coating, AAMA 2605
   2. Color coat and clear coat.
   3. Color: As selected by architect from manufacturer's custom colors.
D. Mounting Hardware:
   1. Stud mount with and with out standoff. Refer to drawings.
E. Context of Text:
   1. Verify verbiage at time of shop drawing submittal. Contractor shall coordinate with Architect.
F. Location: Exterior building facade and interior locations as shown in drawings.

2.04 CUSTOM CUT VINYL LETTER SIGNAGE

A. Material: Vinyl.
   1. Product: 751 High Performance Cast by Oracal.
   2. Thickness: 2 mil.
   3. Adhesive: Solvent Polyacrylate Permanent.
   4. Color: As selected by Architect from manufacturer's full line.
B. Font: As selected by Architect.
C. Sizes: Refer to drawings.
D. Context of Text:
   1. Verify verbiage at time of shop drawing submittal. Contractor shall coordinate with Owner/Architect.
E. Location: As selected by Architect.

2.05 SITE SIGNAGE

A. General:
   1. All signs are required to comply with ADAAG and ANSI/ICC A 117.1 and applicable building codes, unless otherwise indicated; in the event of conflicting requirements, comply with the most comprehensive and specific requirements.

B. Materials:
   1. Exterior Steel Panels:
      a. Panel Construction: 16 gauge electro-galvanized paintlock steel, ASTM A 591.
      b. Corner Condition: Round 1/2 inch (13 mm) diameter corner.
      c. Mounting: Refer to drawings.
   2. Sign Posts:
      a. Post: Galvanized 2 inch (50 mm) square by 12 gauge steel tube with 7/16 inch (11 mm) holes at 1 inch (25 mm) on center.
      b. Ground Anchor Sleeve: Galvanized 2 1/2 inch (64 mm) square by 12 gauge sleeve.
C. Signage Types:
   1. ADA Signage and Parking Signage with Pictograms:
      a. Text/Pictogram Placement: Centered.
      b. Size/Shape: Varies, refer to drawings.
      c. Context of Text/Pictograms: Exact verbiage/pictograms will be supplied at time of shop drawing submittal. Contractor shall coordinate with Owner/Architect. Refer to Civil drawings.
      d. Locations: As shown on drawings.
D. Finishes:
   1. Panel: One (1) coat of metal primer and Two (2) coats of synthetic automotive enamel.
      a. Colors: As selected by Architect.
   2. Text and Graphics: Two (2) coats of bulletin paint.
      a. Font: ADA approved font as selected by Architect from manufacturer's full range.
      b. Color: White.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that substrate surfaces are ready to receive work.
B. Complete all finishing operations, including painting, before beginning installation of signage systems.
C. Surfaces shall be dry and free from dirt, grease and loose paint.

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 SCHEDULE - REFER TO DRAWINGS

END OF SECTION 10 1400

This page intentionally left blank

SECTION 10 1463

MARQUEE MESSAGE CENTER AND SIGN

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Furnish all labor, materials, equipment, tools and services required to fully complete all Marquee Message Center and Sign work as is indicated on the drawings and/or specified herein including, but not limited to, the following described items:
B. Electronic, full color, LED message center with 10mm pitch including control software for operating message center and other accessories for complete functional installation.
C. Do not include sales tax, refer to Section 00 1115 - Advertisement for Prequalification of Bidders.

1.02 RELATED REQUIREMENTS

A. Section 03 3000 - Cast-in-Place Concrete: Concrete footings.
B. Section 03 4713 - Tilt-Up Concrete.
C. Section 05 5000 - Metal Fabrications: Post.
D. Section 11 6643 - Interior Electronic Scoreboards: Multipurpose room scoreboard.
E. Division 26 - Electrical supply, conduit, wiring, and other electrical components for message centers and controls.

1.03 REFERENCE STANDARDS

A. American Society for Testing and Materials (ASTM) Publications:
    1. ASTM B221 - Aluminum-Alloy Extruded Bar, Rod, Wire, Shape, and Tube.
B. National Electrical Code.
C. Federal Communications Commission, Part 15 Rules & Regulations.
D. UL and C-UL standard for Electric Signs

1.04 DEFINITIONS

A. Light emitting diode (LED): Semi-conductor diode that converts DC electric energy into electromagnetic radiation at a visible frequency. Color of the LED is a function of emitted wavelength.
B. Luminosity: Brightness of light emitting image. Unit of measure is NIT equal to one candela per square meter.
C. Pitch: Spacing or distance between two elements such as pixels.
D. Pixel: The smallest element of a display which can be assigned a color. Message center pixels are LED blocks.
E. Resolution: Indication of amount of detail or sharpness of an image. Typically measured by the number of pixels displayed horizontally and vertically.

1.05 SUBMITTALS

A. See Section 01 3000 Administrative Requirements, for submittal procedures.
B. Product data for message center, controls, and accessories shall include descriptions of control functions etc.
C. Installation drawings, face layout, dimensions, construction, electrical wiring diagrams, and method of anchorage.
D. Manufacturer's installation instructions.
E. Finish Samples.

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. Message center shall be designed for exterior installation with weatherproof housing.
B. Message center and other electrical components shall be certified for use in United States and Canada by Underwriters Laboratories (UL) and shall bear UL label.
C. Message center and other electrical components shall be electrically grounded in accordance with National Electrical Code (NEC), Article 600
    1. Wireless control unit shall comply with Part 15 of FCC Rules.

1.07 GUARANTEE

A. Provide under provisions of Section 01 7800 - Closeout Submittals: 5 years parts and labor guarantee for message center to cover defects in materials and workmanship.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. The following manufacturer was used as the basis of design:
    1. Daktronics: www.daktronics.com.
B. Subject to compliance with requirements of this section the following manufacturers are acceptable:
    1. Watchfire: watchfire.com.
    2. American LED Technology: www.americanledtechnology.com
    3. Nevco: www.nevco.com
    4. Substitutions: Refer to Section 01 6000 - Product Requirements.

2.02 MATERIALS

A. Aluminum housing: Fabricated from 0.080 inch minimum thickness, ASTM B221 aluminum sheet. Finish with acrylic polyurethane paint with ultraviolet inhibitor providing long lasting finish.
    1. Color selected by architect from manufacturer’s full color range.
B. LED (light emitting diode): Designed to provide excellent visibility from all angles and sides.
C. Control cable: Fiber optic or Ethernet.
D. Fasteners, anchors, brackets, and other exposed hardware not supplied shall be corrosion resistant.

2.03 FULL COLOR LED MESSAGE CENTER

A. Type: Exterior, electronic, full color, LED, double-sided message center to be attached to concrete structure, 10mm Full Color LED Message Center.
    1. Message Center Size: 7 foot 6 inches wide by 4 foot high.
    2. Refer to architectural details.
B. Power requirements:
    1. Input: 240v.
C. Power Supply
    1. All power supplies shall be regulated, auto-ranging AC to DC power, with protection for the LED pixel, LED display and driver circuitry in the event of power spikes or surges.
    2. Each power supply and their connectors shall be fully sealed to protect from corrosive environmental factors meeting IP-67 standards.
D. Internal Wiring
    1. Wiring for LED display modules and other internal components shall be installed in the housing in a neat and professional manner.

2. Wiring shall not impede the removal of display modules, power supplies or other display components.
3. Wires shall not make contact with or be bent around sharp metal edges.
4. All wiring shall conform to the National Electric Code.

E. The display shall be protected from electrical spikes and transients.
F. The manufacturer shall provide an earth-ground lug on the display.
G. Should replacement of a block of pixels be necessary, message center shall be pixel by pixel adjustable to compensate for the effects of age degradation.
H. Maintenance access: Front.

2.04 MESSAGE CENTER CONTROL SYSTEM

A. Provide operating software and computer as required to provide turn key based solution. Cloud based solutions shall be free of charge to the owner for the life of the marquee.
B. Communications link to the message center: Ethernet, Fiber Optic, or wireless cellular.
C. Graphic capabilities: Text, animation, logos, multiple fonts, moving messages, and video file capability.
    1. Each Message Center “project file” shall contain all the required information to successfully establish message frames on a given message center, from user created “playlists’. These frames and playlists shall have user definable attributes to comply with local sign laws regarding timing and presentation.
D. Input: Control software shall have ability to import AVI, BMP, JPG and GIF image files from Adobe, Corel, and other standard computer graphics software.
E. Control software shall consist of a single MMI window. Switching between windows and programs to affect message center properties shall not be allowed.
F. Proof of Performance: Software will provide an event record as proof of performance.
G. Display dimming: 16 levels controlled manually. (Outdoor, automatic with sensor.)
H. Automatic scheduling: Provide for creating schedule to display stored messages.
I. Provide temperature probe and photocell (outdoor only).

2.05 ACCESSORIES

A. Provide message center with control cable of required length in installation drawings. Outdoor includes temperature sensor / photocell. Electrical junction boxes, conduits, mounting hardware, and other accessories as required for installation are to be provided by others.

PART 3 - EXECUTION

3.01 PREPARATION

A. Coordinate provision of message center with:
    1. Design and construction of concrete footings and steel posts and other structural framing detailed on Drawings and specified in other sections.
    2. Design and provision of electrical supply, conduit, wiring, disconnect switch, weatherproof receiver and circuit boxes, and other electrical components for powering message center and controls.
B. Prior to installation, verify type and location of power supply.

3.02 INSTALLATION

A. Before installation, field test message center for operating functions. Ensure that message center accurately performs all operations. Correct deficiencies.
B. Install message center and accessories in accordance with manufacturer's instructions and approved installation drawings.
C. Rigidly mount message center level and plumb with fasteners.

D. Protect message center from other construction operations.

3.03 DEMONSTRATING AND TRAINING

A. In accordance with Section 01 7900 - Starting, Adjusting, and Demonstrating, provide demonstration and training session for Owner's representative covering operation and maintenance of electronic message center.
   1. Provide operating manual with clear easy to follow instructions. Manufacturer will offer instruction and demonstration at the factory. Provide technical consultation by phone to answer any questions.

END OF SECTION 10 1463

SECTION 10 2110

PHENOLIC TOILET COMPARTMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Furnish all labor, materials, equipment, tools and services required to fully complete all Phenolic Toilet Compartment work as is indicated on the drawings and/or specified herein including, but not limited to, the following described items.
B. Phenolic Urinal screens.
   1. Location: Restroom A123.
C. Hardware and structural accessories.
D. Do not include sales tax, refer to Section 00 1115 - Advertisement for Prequalification of Bidders.

1.02 RELATED SECTIONS

A. Section 06 1000 - Rough Carpentry: Blocking and supports.
B. Section 09 2116 - Gypsum Board Assemblies: Concealed steel support members.
C. Section 10 2800 - Toilet, Bath, and Utility Accessories.

1.03 REFERENCES

A. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2021a.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordination: Coordinate the work with placement of support framing and anchors in walls.
B. Field Measurements: Verify dimensions in areas of installation by field measurements before fabrication and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Shop Drawings: Indicate partition plan, elevation views, dimensions, details of wall supports, door swings.
C. Product Data: Provide data on panel construction, hardware, and accessories.
D. Samples: Submit two samples of partition panels, 6 x 6 inch in size illustrating panel finish, color, and sheen.
E. Manufacturer's Installation Instructions: Indicate special procedures and perimeter conditions requiring special attention.

1.06 DELIVERY, STORAGE AND PROTECTION

A. Deliver materials in manufacturer's original packaging to protect from damage.
B. Store materials in manufacturer's original packaging in accordance with manufacturer's instructions. Store materials indoors, protected from the elements and construction hazards.
C. Handle materials in a manner that will protect the finished product.

1.07 WARRANTY

A. This Contractor shall guarantee his work for a period of One (1) year from date of Substantial Completion. Guarantee shall be in form found in Section 01 7800.

B. Provide manufacturer's Twenty-Five (25) year written limited warranty on its Panels, Pilasters and Doors, against chipping, breakage, corrosion, delamination and defects in workmanship; to be replaced without charge excluding labor.
C. Provide manufacturer's Ten (10) year written limited warranty on all Cast Stainless Steel Hardware, Hinges and Mounting Brackets, as well as on all full high aluminum mounting brackets, against defects in material and workmanship. All other hardware will be provided with a manufacturer's One (1) year written limited warranty, against all defects in material and workmanship.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Basis of Design Manufacturer:
   1. Columbia Partitions: www.psisc.com.
      a. Product - Phenolic Partitions Series 58000.
B. Other Approved Manufacturers:
   1. Bradley Corporation: www.bradleycorp.com.
   2. Bobrick Washroom Equipment, Inc: www.bobrick.com.
   3. Metpar Corporation: www.metpar.com.
   4. Accurate Partitions Corp: www.accuratepartitions.com.
   5. General Partitions: www.generalpartitions.com.
   6. Global Steel Products Corp: www.globalpartitions.com.
   7. Substitutions: Section 01 6000 - Product Requirements.

2.02 INSTALLATION TYPE

A. Toilet Compartments: Overhead-braced, floor supported.
B. Urinal Screens: Wall hung, floor to ceiling supported.

2.03 MATERIALS

A. Material shall be Solid Phenolic with a High Pressure Melamine matte finish surface made as an integral part of the core material. Laminated surfaces are not acceptable.
   1. Surface and edges shall be non-porous and shall not support fungus or bacteria. Provide material which has been selected for uniform color, surface flatness and smoothness.
   2. Exposed surfaces which exhibit discolorations, pitting, seam marks, roller marks, stains, telegraphing of core material, or other imperfections on finished units are not acceptable. Defects such as chipping along edges and corners are unacceptable.
   3. Solid Phenolic shall meet or exceed all requirements for Class B Flame Spread Rating and Smoke Developed calculated according to ASTM E84, and shall carry a Class B Fire Rating Certification. Class B Fire Rating Certification shall be in the name of the Toilet Partition Manufacturer and shall be less than six (6) months old.
B. Material Thicknesses:
   1. Doors - Minimum .75 inch (19 mm) Finished Thickness.
   2. Divider Panels - Minimum .50 inch (13 mm) Finished Thickness.
   3. Pilasters - Minimum .75 inch (19 mm) Finished Thickness.
C. Colors: To be selected by Architect from Melamine Manufacturer's full range of colors, including premium.

2.04 HARDWARE

A. Continuous Hinge: Continuous Hinge (57.5 inches) shall be made of Type 304, 14 gage (2 mm) Stainless Steel and shall have a Polished Satin Finish. Hinge shall be 3 inches (76 mm) wide and shall have cam knuckles for gravity type self-closing action. Pivot pin shall be 0.250 inch (6 mm) in diameter, and shall be made of Type 304 Stainless Steel.
   1. Pivot pin shall be 0.250 inch (6 mm) in diameter, and shall be made of Type 304 Stainless Steel.
      a. Pivot pin shall be non removable
   2. Hinges shall provide emergency access by lifting the door. Inswinging Hinges shall be preset to hold Door open at 15 degrees and Outswinging Hinges shall be preset to hold Doors in the closed position when unlatched. Hinges shall be pre-drilled for mounting to door and pilaster.
   3. Mounting holes shall be at 9 inches (229 mm) O.C. for mounting to door and pilaster with Theft Proof Stainless Steel Torx Head with Pin Through-Bolts. Brass inserts are unacceptable.
   4. Each Hinge is to be labeled by stock number, manufacturer, and left or right hand. Furnish one Hinge per door.

B. Indicator Latch: Indicator Latch shall be Heavy Duty Type 304, Cast Stainless Steel and shall have a Polished Satin Finish. The Indicator Latch shall be surface mounted and shall require less than five (5) lbs to operate. As the Latch is operated inside of the Partition, the Indicator located on the outside of the Partition will show "Green" for Unoccupied and "Red" for Occupied. The Latch Arm serves as the Keeper and shall be fitted with a Rubber Pad to protect the finish of the Door. On Standard Doors, the Latch shall be mounted to the Pilaster and on Disabled Accessible or Outswing Doors, the Latch shall be mounted on the Door. Furnish one per door.

C. Privacy Option Sightless Strike: The vertical edges of all Doors and Pilasters shall be rabbetted to a width and depth of 0.375 inch to provide for a sightless condition between the Door and Pilaster. Note: The Door width will be greater than the opening size. The rabbetted edge of the Door will overlay the rabbetted portion of the Pilaster to provide a sightless condition. The rabbetted portion of the Pilaster shall act as the Strike.

D. Coat Hook: Coat Hook shall be made of Heavy Duty Type 304 Cast Stainless Steel with a Polished Satin Finish. Coat Hook and Bumper shall be 2.340 inches (59 mm) high, 1.230 inches (31 mm) wide and shall protrude out from the door 3.05 inches (77 mm).
   1. The hook portion shall have a finished diameter of 0.250 (6 mm). Coat Hooks shall be mounted to the Door with Theft Proof Stainless Steel Torx Head with Pin Through-Bolts. Stamped Stainless Steel Coat Hooks are unacceptable.
   2. The stock number shall be molded into the back of the Coat Hook and Bumper for ease in identification. Furnish one per door.

E. Pull Handle: Pull Handle shall be made of Heavy Duty Type 304 Cast Stainless Steel with a Polished Satin Finish. Chrome Plated Zamac and Stamped Stainless Steel Door Pulls are unacceptable.
   1. Pull Handle shall protrude from the face of the door 0.940 inch (24 mm) and shall be 4.735 inches (120 mm) long. The Pull Handle shall have mounting holes drilled and tapped for 10/24 threads at 3.50 (89 mm) O.C. The Pull Handle shall be0 .655 inch (17 mm) wide.
   2. The stock number shall be molded into the back of the Pull Handle for ease in identification. Furnish two for each Disabled Accessible door.

F. Door Stop: Door Stop shall be Heavy Duty Type 304 Cast Stainless Steel with a Polished Satin Finish. Chrome Plated Zamac and Stamped Stainless Steel Door Stops are unacceptable.

1. Door Stop shall have a 2.125 inch (54 mm) base diameter and shall protrude 1.80 inches (46 mm) from the wall. The bumper at the end of the Door Stop shall be 0.250 (6 mm) thick. The diameter of the shaft shall be 0.6875 inch (17 mm).
2. The stock number shall be molded into the back of the Door Stop for ease in identification. Furnish one for each Disabled Accessible or outswing door.

G. Continuous Mounting Brackets: Brackets shall be Full High, 57.5 inches (1451 mm), Type 304 Stainless Steel and shall have a Polished Satin Finish. Continuous Double Ear and Single Ear Brackets shall be used to mount panel/pilaster to wall. Continuous 'U' Brackets shall be used to mount panel to pilaster.
1. Inside opening of Bracket shall be 0.50 inch (13 mm) for panels and 0.75 inch (19 mm) for pilasters. All holes in Brackets for mounting to wall and panel/pilaster shall be pre-drilled. Holes are to be spaced at 9 inches (229 mm) O.C. along the full length of the Bracket for a total of fourteen (14) holes for mounting to wall, and seven (7) for mounting to panel or pilaster.
2. Panels and Pilasters shall be secured to Brackets with Theft Proof Stainless Steel Torx Head with Pin Through-Bolts. Attachments made with screws into core material are unacceptable. Brackets made of Aluminum, Chrome Plated Zamak or Single High Stamped Stainless Steel are unacceptable.

H. Overhead Bracing (Headrail): Continuous Heavy Duty Extruded 6063-T5 Aluminum Headrail with Anti-Grip profile. Headrail shall have a Satin Anodized finish and shall have integral reinforcing channel and curtain track.
1. Provide Headrail Corner Brackets, Wall Brackets, and Headrail End Caps as required. The Headrail and Aluminum Headrail Corner Brackets shall have a minimum wall height of 2 inches (51 mm). The minimum wall thickness of the Headrail and Headrail Corner Brackets shall be 0.125 inch (3 mm).
2. The Headrail Wall Brackets shall be made of Type 304, 18 gage (1.3 mm) Stainless Steel.

I. Pilaster Shoes: Pilaster Shoes shall be Type 304, 18 gage (1.3 mm) Stainless Steel and shall have a #4 Polished Satin Finish. Shoes shall be 3 inches (76 mm) high and shall have an integral heel for structural connection to the floor with Stainless Steel fasteners.
1. Shoes shall be attached to Pilasters with Theft Proof Stainless Steel Torx Head with Pin Screws. Zinc Plated fasteners for connection to the floor are unacceptable.

J. Anchorages and Fasteners: All Fasteners shall be Type 304 Stainless Steel and shall have Theft Proof Torx Heads with Pin. Stainless Steel Through-Bolts shall withstand a direct pull force in excess of 2000 lbs (907 kg) each. All Fasteners shall be Through-Bolted unless noted otherwise. Chrome Plated Steel, Zinc Plated Steel and Brass Fasteners are not acceptable.
1. All Fasteners shall be Through-Bolted unless noted otherwise. Chrome Plated Steel, Zinc Plated Steel and Brass Fasteners are not acceptable.

2.05 FABRICATION

A. General: Provide Doors, Panels, Pilasters and Urinal Screens fabricated for the partition system, complete with all accessories and hardware listed above and as required for installation of a fully functional system, unless otherwise noted. Provide units with cutouts and drilled holes to receive partition-mounted hinges, accessories, and grab bars as indicated.

B. Pilasters: Each Pilaster shall have zinc plated threaded insert(s) threaded into the base of the Pilaster to receive 0.3125 x 2.5 inches (8 x 64 mm) Type 304 Stainless Steel Jack Bolt(s) for leveling purposes. Pilaster Shoe shall be 3 inches (76 mm) high Type 304, 18 gage (1.3 mm) Stainless Steel and shall have an integral heel for structural connection to the floor with Stainless Steel fasteners.

C. Doors: Unless otherwise indicated, provide 24 inches (610 mm) wide in-swinging doors for standard Toilet Partitions and 36 inches (914 mm) wide out-swinging doors with a minimum 32 inches (813 mm) wide clear opening for Partitions indicated to be Handicapped Accessible.

D. Floor Anchored Urinal Screens: Furnish Urinal Screens consisting of a pilaster and a panel of the same construction and finish as the Toilet Partitions. Furnish in accordance with the drawings.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that room dimensions are in accordance with Toilet Partition Shop Drawings. Inspect walls to insure that they are plumb and suitable for the Wall Brackets.
B. Check location of entrance doors and location of plumbing fixtures. Verify that these are in accordance with Toilet Partition Shop Drawings and that there is adequate clearance between plumbing fixtures and dividing panels or screens.
C. Have any inappropriate conditions corrected before beginning installation.

3.02 INSTALLATION

A. All partitions and screens to be installed with 16" clearance from the floor to the bottom of the partition or screen.
B. Comply with manufacturer’s written installation instructions.
    1. Install Partitions rigid, straight, plumb, and level. Provide clearances of not more than 0.50 inch (13 mm) between pilasters and panels, and not more than 1.0 inch (25 mm) between pilasters/panels and walls.
    2. No evidence of drilling, cutting and patching shall be visible in finished work.
C. Overhead-Braced Floor Supported Partitions: Secure Pilasters to floor and level, plumb, and tighten.
    1. Maintain proper Door Openings and secure continuous Overhead Brace (Headrail) to each pilaster with not less than two (2)Theft Proof Stainless Steel Torx Head with Pin Through-Bolts.
    2. Hang Doors and adjust so that tops of Doors are parallel with Overhead Brace and are the same height as the panels when doors are in closed position.
D. Screens: Attach with anchoring devices according to manufacturer’s written instructions and to suit supporting structure.
    1. Set units level and plumb.
E. Mount accessories to Partition units in accordance with accessory manufacturer’s instructions.

3.03 TOLERANCES

A. Maximum Variation From True Position: 1/4 inch.
B. Maximum Variation From Plumb: 1/8 inch.

3.04 ADJUSTING AND CLEANING

A. Hardware Adjustment: Adjust hardware according to manufacturer’s written instructions for proper operation. Adjust cam on all out-swinging doors to hold doors in closed position when unlatched. Adjust cam on all in-swinging doors to hold doors in open position when unlatched.
B. Provide final protection and maintain conditions that ensure Toilet Partitions and Screens are without damage or deterioration at the time of Substantial Completion.
C. Clean all exposed surfaces of Toilet Partitions and hardware.

END OF SECTION 10 2110

This page intentionally left blank

SECTION 10 2239

FOLDING PANEL PARTITIONS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Furnish all labor, materials, equipment, tools and services required to fully complete all Folding Panel Partition work as is indicated on the drawings and/or specified herein including, but not limited to, the following described items.
B. Manual Operation Folding Panel Partition.

1.02 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide data on fabric colors and finishes available.
C. Samples: Color samples demonstrating full range of finishes available to Architect. Verification samples shall be available in same thickness and material indicated for the work.
D. Maintenance Data: Include recommended cleaning methods, cleaning materials, and stain removal methods. Describe cleaning materials detrimental to finish surfaces and hardware finish.

1.03 WARRANTY

A. The Contractor shall guarantee his work for a period of One (1) year from date of Substantial Completion. Guarantee shall be on form included in Section 01 7800.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Basis of Design Manufacturer:
    1. Modernfold, Inc: www.modernfold.com.
        a. Manual Operation: Acousti-Seal 900 Series.
B. Other manufacturers shall be allowed to submit as a proposed substitute **before bid time, no post-bid substitution requests will be considered.** Proposed substitute manufacturers shall furnish published literature verifying that the proposed substitution meets all requirements of the Specifications and is suitable for the intended use. The Owner will evaluate any proposed substitutions and will make the final determination as to whether or not the product is acceptable to them for this project. Refer to Section 01 6000 - Product Requirements.
    1. The following components must be included in proposed substitute:
        a. Manual Operation:
            1) Minimum 11 gage steel track/trolley system.
            2) Steel Panel - Roll formed and lock welded to panel.
            3) Steel vertical astragals (seals).
            4) Automatic bottom seals.

2.02 MATERIALS

2.03 CONTINUOUSLY HINGED PANEL PARTITIONS, MANUAL OPERATION

A. Product: Acousti-Seal 900 Operable Partition by Modernfold, Inc., manually operated series of continuously hinged panels, top supported with operable floor seals.

B. Panel Construction and STC Rating: Nominal 3 inch (76 mm) thick in manufacturer's standard 48 inch (1220 mm) width by height required, with horizontal and vertical framing elements fabricated from 18 gage minimum formed steel with overlapped and welded corners. Top channel is reinforced to support suspension system components.
   1. Panel Skin: Roll-formed steel wrapping around panel edge, with panel skins lock-formed and welded directly to the frame for unitized construction with minimum STC as follows:
      a. STC 50.
   2. Hinges for Closure Panels for Steel Panels: Full leaf butt hinges, attached directly to panel frame with welded hinge anchor plates within panel to further support hinge mounting to frame.
   3. Panel Trim: No vertical trim required or allowed on vertical edges of panels; minimal groove appearance at panel joints.
   4. Panel Weight: As standard with manufacturer for STC selected, 8 to 11 pounds per sq ft.

C. Panel Finish and Exposed Trim: Factory applied as follows:
   1. Panel Finish: Reinforced heavy-duty vinyl with woven backing weighing not less than 27 ounces per lineal yard.
      a. Color: As selected by Architect from manufacturer's full range.
      b. Flammability: Shall comply with ASTM E84 and shall achieve a Class "A" rating of 0 to 25.
   2. Exposed Panel Trim Color: As selected by Architect from manufacturer's full range.

D. Panel Windows:
   1. Glass: 1 inch clear insulated glazing unit with inner pane laminated with PVB inner layer - tempered.
      a. Annealed Type: ASTM C1036, Type I - Transparent Flat, Class 1 - Clear, Quality - Q3.
      b. Kind FT - Fully Tempered Type: Complies with ASTM C1048.
   2. Size: As shown on drawings.

E. Sound Seals and Bottom Seals:
   1. Vertical Interlocking Sound Seals Between Panels: Roll-formed steel astragals, with reversible tongue and groove configuration in each panel edge for universal panel operation. Rigid plastic or aluminum astragals or astragals in only one panel edge are not acceptable.
   2. Horizontal Top Seals: Continuous contact extruded vinyl bulb shape with pairs of non-contacting vinyl fingers to prevent distortion without the need for mechanically operated parts.
   3. Horizontal Bottom Floor Seals: Automatic operable seals providing nominal 2 inch (51 mm) operating clearance with an operating range of +1/2 inch (13 mm) to -1 1/2 inch (38 mm) which automatically drop as panels are positioned, without the need for tools or cranks. (ModernFold IA2).

F. Suspension System and Soffits:
   1. Suspension System: Modernfold No. 17 Suspension System:
      a. Track: Minimum 11 gage, 0.12 inch (3.04 mm) roll-formed track, supported by adjustable steel hanger brackets, supporting the the load-bearing surface of the track, connected to structural support by pairs of 3/8 inch (9.5 mm) diameter threaded rods.
      b. Exposed Track Soffit: Steel, integral to track and pre-painted white.
      c. Carriers: Two all steel trolleys with steel tired ball bearing wheels. Suspension system shall provide automatic indexing of panels into stack area using preprogrammed switches and trolleys without electrical, pneumatic or mechanical activation (ModernFold Smart Track).

G. Special Components:

1. Single Pass Door: Same thickness and appearance as panels. Trimless ADA compliant pass door with friction latch and flush pulls for panic operation. Threshold is not acceptable.

2.04 CONTINUOUSLY HINGED PANEL PARTITIONS, ELECTRIC OPERATION

A. Product: Acousti-Seal 933E Operable Partition by Modernfold, Inc., electrically operated series of continuously hinged panels, top supported with operable floor seals.

B. Panel Construction and STC Rating: Nominal 3 inch (76 mm) thick in manufacturer's standard 48 inch (1220 mm) width by height required, with horizontal and vertical framing elements fabricated from minimum 18 gage formed steel with overlapped and welded corners. Top channel is reinforced to support suspension system components.
   1. Panel Skin: Nominal 21 gage roll-formed steel wrapping around panel edge, with panel skins lock-formed and welded directly to the frame for unitized construction with minimum STC as follows:
      a. STC 50.
   2. Hinges for Closure Panels for Steel Panels: Full leaf butt hinges, attached directly to panel frame with welded hinge anchor plates within panel to further support hinge mounting to frame.
   3. Panel Trim: No vertical trim required or allowed on vertical edges of panels; minimal groove appearance at panel joints.
   4. Panel Weight: As standard with manufacturer for STC selected, 8 to 11 pounds per sq ft.

C. Panel Finish and Exposed Trim: Factory applied as follows:
   1. Panel Finish: Acoustical, non-woven needle punch carpet, with fused fibers to prevent unraveling or fray of material.
      a. Color: As selected by Architect from manufacturer's full range.
      b. Flammability: Shall comply with ASTM E84 and shall achieve a Class "A" rating of 0 to 25.
   2. Exposed Panel Trim Color: As selected by Architect from manufacturer's full range.

D. Sound Seals and Bottom Seals:
   1. Vertical Interlocking Sound Seals Between Panels: Roll-formed steel astragals, with reversible tongue and groove configuration in each panel edge for universal panel operation. Rigid plastic or aluminum astragals or astragals in only one panel edge are not acceptable.
   2. Horizontal Top Seals: Continuous contact extruded vinyl bulb shape with pairs of non-contacting vinyl fingers to prevent distortion without the need for mechanically operated parts.
   3. Horizontal Bottom Floor Seals: Floating operable seals providing nominal 3-1/2 inches (89 mm) operating clearance within operating range of plus 1/2 inch (15 mm) to minus 3 inches (76 mm) to provide continuous floor contact as panels are positioned without the need for tools or cranks.

E. Suspension System and Soffits:
   1. Suspension System: Modernfold No. 14 Suspension System:
      a. Track: Nominal 7 gage formed steel track with adjustable steel hanger brackets supporting the load bearing surface of the track, connected to structural support by pairs of 1/2 inch (13 mm) diameter threaded rods; no failure of track or brackets at 5,000 lb. (2268 kg) static point loading at mid-span with brackets at 48 inch (1220 mm) centers.
      b. Exposed Track Soffit: Steel, removable for service and maintenance, attached to track bracket without exposed fasteners and pre-painted off-white.
      c. Carriers: All-steel trolleys with steel tired ball bearing wheels.

F. Special Components:

1. Single Pass Door: Same thickness and appearance as panels. Trimless ADA compliant pass door with friction latch and flush pulls for panic operation. Threshold is not acceptable.

PART 3 EXECUTION

3.01 EXAMINATION

A. Do not begin installation until supports and substrates have been properly prepared.
B. Verify that field measurements are as indicated on shop drawings.
C. Verify that required utilities are available, of the correct characteristics, in proper location, and ready for use.
D. Notify Architect in writing of unsatisfactory preparation prior to installation. Do not proceed until unsatisfactory conditions have been corrected.

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 and pocket doors level and plumb.
D. Install acoustic sealant to achieve required acoustic performance.
E. 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.
B. Protect installed products until completion of project.
C. Touch-up, repair or replace damaged products before Substantial Completion.

3.05 CLOSEOUT ACTIVITIES

A. Demonstrate operation of partition and identify potential operational problems.

END OF SECTION 10 2239

SECTION 10 2601

WALL AND CORNER GUARDS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Furnish all labor, materials, equipment, tools and services required to fully complete all Wall and Corner Guard work as is indicated on the drawings and/or specified herein including, but not limited to, the following described items.
B. Stainless steel corner guards.

1.02 RELATED REQUIREMENTS

A. Section 09 2116 - Gypsum Board Assemblies: Placement of supports in stud wall construction.

1.03 REFERENCE STANDARDS

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Product Data: Indicate physical dimensions, features, wall mounting brackets with mounted measurements, anchorage details, and rough-in measurements.
C. Shop Drawings: Include plans, elevation, sections, and attachment details. Show design and spacing of supports for protective corridor handrails, required to withstand structural loads.
D. Samples: Submit samples illustrating component design, configurations, joinery, color and finish.
    1. Submit two sections of corner guards, 24 inches long.
E. Warranty Documentation: Submit manufacturer warranty and ensure that forms have been completed in Murray City School District 's name and registered with manufacturer.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Deliver wall and door protection items in original, undamaged protective packaging. Label items to designate installation locations.
B. Store products in either horizontal or vertical position, in compliance with manufacturer's instructions.

1.06 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.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Basis of Design
    1. Inpro: www.inprocorp.com.
B. Other Approved Manufacturers
    1. Babcock-Davis: www.babcockdavis.com
    2. Construction Specialties, Inc: www.c-sgroup.com
    3. Koroseal Interior Products: www.koroseal.com
    4. Nystrom, Inc: www.nystrom.com
    5. Trim-Tex, Inc: www.trim-tex.com
    6. Pawling Corporation: www.pawling.com

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

2.02 COMPONENTS

A. Stainless Steel Corner Guards - Surface Mounted: One piece unit without splices, installed with adhesive.
   1. Material: Type 430 stainless steel, No. 4 finish.
   2. Thickness: 16 gage, 0.06 inch.
   3. Width of Wings: 1-1/2 inches.
   4. Length: One piece, 48 inches
   5. Styles: Provide both 90 degree corners and 180 degree wall end protectors.
   6. Products:
      a. Inpro Stainless Surface Mount Stainless Steel Corner Guard.
      b. Substitutions: See Section 01 6000 - Product 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.
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 above finished base.

3.03 TOLERANCES

A. Maximum Variation From Required Height: 1/4 inch.
B. Maximum Variation From Level or Plane For Visible Length: 1/4 inch.

END OF SECTION 10 2601

SECTION 10 2800

TOILET, BATH, AND UTILITY ACCESSORIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Furnish all labor, materials, equipment, tools and services required to fully complete all Toilet, Bath and Utility Accessory work as is indicated on the drawings and/or specified herein including, but not limited to, the following described items.
B. Accessories for toilet rooms, showers, and utility rooms.
C. Do not include sales tax, refer to Section 00 0102 - Notice to Contractors.

1.02 RELATED REQUIREMENTS

A. Section 09 2116 - Gypsum Board Assemblies: Concealed supports for accessories, including in wall framing and plates.
B. Section 08 8300 - Mirrors: Dance Room Mirrors.
C. Section 09 3000 - Tiling.

1.03 OWNER FURNISHED ITEMS

A. The following shall be supplied by the Owner for installation by the Contractor.
   1. Waste receptacle.
   2. Toilet tissue holder.
   3. Towel dispenser.
   4. Soap dispenser.
   5. Sanitary napkin dispenser.

1.04 REFERENCE STANDARDS

A. 36 CFR 1191 - Americans with Disabilities Act Accessibility Guidelines for Buildings and Facilities; Final Rule; current edition; (ADA Standards for Accessible Design).
B. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2017.
C. ASTM A269/A269M - Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service; 2015a (Reapproved 2019).
D. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2020.
E. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2015.
F. ASTM C1503 - Standard Specification for Silvered Flat Glass Mirror; 2018.

1.05 ADMINISTRATIVE REQUIREMENTS

A. Coordinate the work with the placement of internal wall reinforcement and reinforcement of toilet partitions to receive anchor attachments.

1.06 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide data on accessories describing size, finish, details of function, attachment methods.
C. Manufacturer's Installation Instructions: Indicate special procedures and conditions requiring special attention.

1.07 GUARANTEE

A. The Contractor shall guarantee his work for a period of 5 years from date of Substantial Completion. Guarantee shall be on form included in Section 01 7800.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Basis of Design Manufacturer:
   1. Bradley Corporation: www.bradleycorp.com.
B. Other Acceptable Manufacturers:
   1. A & J Washroom Accessories Inc: www.ajwashroom.com.
   2. American Specialties, Inc: www.americanspecialties.com.
   3. Bobrick Washroom Equipment Inc: www.bobrick.com.
   4. American Accessories Inc: www.aaiusaonline.com.
   5. Columbia Accessories: www.psisc.com.
C. All items of each type to be made by the same manufacturer.

2.02 MATERIALS

A. Accessories - General: Shop assembled, free of dents and scratches and packaged complete with anchors and fittings, steel anchor plates, adapters, and anchor components for installation.
   1. Grind welded joints smooth.
   2. Fabricate units made of metal sheet of seamless sheets, with flat surfaces.
B. Keys: Provide 2 keys for each accessory to Owner; master key all lockable accessories.
C. Stainless Steel Sheet: ASTM A666, Type 304.
D. Stainless Steel Tubing: ASTM A269, Type 304 or 316.
E. Galvanized Sheet Steel: Hot-dipped galvanized steel sheet, ASTM A653/A653M, with G90/Z275 coating.
F. Mirror Glass: Float glass, ASTM C1036 Type I, Class 1, Quality Q2, with silvering, protective and physical characteristics complying with ASTM C1503.
G. Adhesive: Two component epoxy type, waterproof.
H. Fasteners, Screws, and Bolts: Hot dip galvanized, tamper-proof, security type.
I. Expansion Shields: Fiber, lead, or rubber as recommended by accessory manufacturer for component and substrate.

2.03 FINISHES

A. Stainless Steel: No. 4 satin brushed finish, unless otherwise noted.
B. Chrome/Nickel Plating: ASTM B456, SC 2, satin finish, unless otherwise noted.
C. Baked Enamel: 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 TOILET ROOM ACCESSORIES

A. Grab Bars: Stainless steel, non-slip grasping surface finish.
   1. Standard Duty Grab Bars:
      a. Push/Pull Point Load: 250 pound-force, minimum.
      b. Dimensions: 1-1/4 inch outside diameter, minimum 0.05 inch wall thickness, concealed flange mounting, 1-1/2 inch clearance between wall and inside of grab bar.

c. Length and Configuration: As indicated on drawings.
d. Products:
1) 812 Series manufactured by Bradley Corporation.

B. Sanitary Napkin Disposal Unit: Stainless steel, surface-mounted, self-closing door, full-length stainless steel piano-type hinge, removable receptacle with tumbler lock.
1. Product: 4722-15 manufactured byBradley Corporation.

C. Hand Dryer:
1. Manufacturers:
a. Dyson, Inc.: Product - Dyson airblade V: www.dysonairblade.com.
b. Substitutions: Section 01 6000 - Product Requirements.
2. Finish: White.
3. Electrical: 120v, single phase, 60hz, 9A.
4. Motor: 1000w.

D. Mirrors: Stainless steel framed, 1/4 inch thick tempered safety glass, ASTM C1048.
1. Size: As indicated on drawings.
2. Frame: 0.05 inch angle shapes, with mitered, welded, and ground corners, and tamperproof hanging system; satin finish.
3. Backing: Full-mirror sized, minimum 0.03-inch galvanized steel sheet and nonabsorptive filler material.
4. Provide aluminum spaced behind mirror where tile does not extend full height. Thickness to match tile thickness.
5. Products:
a. 781 Series manufactured by Bradley Corporation.
b. Substitutions: Section 01 6000 - Product Requirements.

E. Shower Curtain Rod: Stainless steel tube, 1-1/4 inch outside diameter, 0.05 inch wall thickness, satin-finished, with 3 inch outside diameter, minimum 0.04 inch thick satin-finished stainless steel flanges, for concealed mounting.

F. Shower Curtain:
1. Material: Nylon reinforced vinyl, 0.008 inch thick, matte finish, with antibacterial treatment, flameproof and stain-resistant.
2. Grommets: Stainless steel; pierced through top hem on 6 inch centers.
3. Color: White.
4. Shower curtain hooks: Chrome-plated or stainless steel spring wire designed for snap closure.

G. Folding Shower Seat:
1. Heavy-duty hinged seat designed to fold up against wall when not in use. Provide support braces, hinges, frame, and fasteners of Type 304 stainless steel. Construct frame of all-welded tubular construction for maximum strength. Provide seat with configuration and seating surface material as follows:
a. Configuration: Rectangular shaped seat.
b. Seat Material: Phenolic or polymeric composite of either slat type of one-piece construction.
1) Color as selected from manufacturer’s standard selections.
c. Basis of Design Product: 9591 manufactured by Bradley Corporation.

H. Folding Shower Seat: ADA Transfer Type Shower:
1. Heavy-duty hinged seat designed to fold up against wall when not in use. Provide support braces, hinges, frame, and fasteners of Type 304 stainless steel. Construct frame of all-welded tubular construction for maximum strength. Provide seat with configuration and seating surface material as follows:
a. Configuration: L-shaped, right hand and L-shaped, left hand seat.

b. Seat Material: Phenolic or polymeric composite one-piece seat or seat slats, of color as selected.
   1) Color as selected from manufacturer's standard selections.
c. Basis of Design Product: 9569 manufactured by Bradley Corporation.

I. Folding Shower Seat: ADA Roll-In Type Shower:
   1. Heavy-duty hinged seat designed to fold up against wall when not in use. Provide support braces, hinges, frame, and fasteners of Type 304 stainless steel. Construct frame of all-welded tubular construction for maximum strength. Provide seat with configuration and seating surface material as follows:
      a. Configuration: Rectangular shaped seat.
      b. Seat Material: Phenolic or polymeric composite of either slat type of one-piece construction.
         1) Color as selected from manufacturer's standard selections.

J. ADA Shower Grab Bars: Stainless steel, 1-1/2 inches outside diameter, minimum 0.05 inch wall thickness, nonslip grasping surface finish, concealed flange mounting; 1-1/2 inches clearance between wall and inside of grab bar.
   1. Length and configuration: As indicated on drawings.
   2. Product: 800 Series manufactured by Bradley Corporation.

K. Towel Hook: Stainless steel, 4 7/16 inch (113 mm) extension from wall; rectangular-shaped bracket and backplate for concealed attachment, satin finish.
   1. Product: 9314 manufactured by Bradley Corporation.

L. Combination Utility Shelf/Mop and Broom Holder: 0.05 inch thick stainless steel, Type 304, with 1/2 inch returned edges, 0.06 inch steel wall brackets.
   1. Hooks: 0.06 inch (1.6 mm) stainless steel rag hooks at shelf front.
   2. Mop/broom holders: 3 spring-loaded rubber cam holders at shelf front.
   3. Length: Manufacturer's standard length for number of holders/hooks indicated on Drawings.
   4. Product: 9933/9934 manufactured by Bradley Corporation.

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 shop 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.
B. Install plumb and level, securely and rigidly anchored to substrate.
C. Mounting Heights and Locations: As required by accessibility regulations and as indicated on drawings

3.04 SCHEDULE - REFER TO DRAWINGS

END OF SECTION 10 2800

SECTION 10 4400

FIRE PROTECTION SPECIALTIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Furnish all labor, materials, equipment, tools and services required to fully complete all Fire Protection Specialty work as is indicated on the drawings and/or specified herein including, but not limited to, the following described items.
B. Fire extinguishers.
C. Knox box and mounting hardware
D. Fire extinguisher cabinets.
E. Accessories.
F. Do not include sales tax, refer to Section 00 1115 - Advertisement for Prequalification of Bidders

1.02 RELATED REQUIREMENTS

A. Section 04 2731 - Reinforced Unit Masonry: Roughed-in wall openings.
B. Section 09 2116 - Gypsum Board Assemblies: Roughed in wall openings and blocking in walls.

1.03 REFERENCE STANDARDS

A. FM (AG) - FM Approval Guide; current edition.
B. NFPA 10 - Standard for Portable Fire Extinguishers; 2017, with Errata (2018).
C. 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, extinguisher ratings and classifications, color and finish, anchorage details, and installation instructions.
C. Shop Drawings: Indicate locations of cabinets, cabinet physical dimensions, rough-in measurements for recessed cabinets, locations of individual fire extinquishers, mounting measurements for wall bracket, installation procedures, and accessories required for complete installation.
D. Manufacturer's Installation Instructions: Indicate special criteria and wall blocking coordination requirements.
E. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
F. Maintenance Data: Include test, refill or recharge schedules and re-certification requirements.

1.05 FIELD CONDITIONS

A. Do not install extinguishers when ambient temperature may cause freezing of extinguisher ingredients.

1.06 GUARANTEE

A. The Contractor shall guarantee his work for a period of One (1) year from date of Substantial Completion. Guarantee shall be on form included in Section 01 7800.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Fire Extinguishers, Cabinets, and Accessories:
   1. Ansul, a Tyco Business: www.ansul.com.
   2. Kidde, a unit of United Technologies Corp: www.kidde.com.
   3. Nystrom, Inc: www.nystrom.com.
   4. Oval Brand Fire Products; Oval Dry Chemical Fire Extinguisher - Multipurpose ABC: www.ovalfireproducts.com.
   5. Larsen's Manufacturing Co: www.larsensmfg.com.
   6. Pyro-Chem, a Tyco Business: www.pyrochem.com.
   7. Activar Construction Products Group: www.activarcpg.com.
   8. 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.
   1. Stored Pressure Operated: Deep Drawn.
   2. Class: A:B:C type.
   3. Size: 10 pound.
   4. Finish: Baked polyester powder coat red color.
   5. Temperature range: Minus 65 degrees F to 120 degrees F.
C. Wet Chemical Type Fire Extinguishers: Stainless steel tank, with pressure gage.
   1. Class: K type.
   2. Size: 1.6 gallons.
   3. Finish: Polished stainless steel.
   4. Temperature range: Minus 20 degrees F to 120 degrees F.

2.03 FIRE EXTINGUISHER CABINETS

A. Cabinet Configuration: Recessed type.
   1. Size to accommodate accessories.
   2. Provide cabinet enclosure with right angle inside corners and seams, and with formed perimeter trim and door stiles.
B. Door: 0.036 inch thick, reinforced for flatness and rigidity; latch. Hinge doors for 180 degree opening with two butt hinge. Provide nylon catch and keyed lock.
C. Door Glazing: Float glass, clear, 1/8 inch thick, and set in resilient channel glazing gasket.
D. Cabinet Mounting Hardware: Appropriate to cabinet, with pre-drilled holes for placement of anchors.
E. Weld, fill, and grind components smooth.
F. Finish of Cabinet Exterior Trim and Door: No. 4 - Brushed stainless steel.
G. Finish of Cabinet Interior: White colored enamel.

2.04 KNOX BOX

A. Furnish and install recessed Knox-Box at north main entrance
   1. Knox-Box shall be a 3272_S recessed mount with face flange and recessed mounting kit by Knoxbox.com
   2. Knox-Box keying shall be coordinated with localfire department

3. Exact mounting location shall be coordinated with local fire department and architect
4. Provide wall blocking for through bolt installation

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. Install cabinets plumb and level in wall openings.
C. Secure rigidly in place.
D. Place extinguishers in cabinets and on wall brackets.

3.03 SCHEDULES - REFER TO DRAWINGS

END OF SECTION 10 4400

This page intentionally left blank

SECTION 10 5100

METAL LOCKERS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Furnish all labor, materials, equipment, tools and services required to fully complete all Metal Locker work as is indicated on the drawings and/or specified herein including, but not limited to, the following described items.
B. Standard duty knocked down lockers.
C. Heavy duty knocked down lockers.
D. ADA-Compliant lockers of all types specified, per latest regulations.
E. Metal tops and filler panels.
F. Do not include sales tax, refer to Section 00 0102 - Notice to Contractors.

1.02 RELATED REQUIREMENTS

A. Section 03 3000 - Cast-in-Place Concrete: Concrete base construction.
B. Section 04 2731 - Reinforced Unit Masonry: Masonry base construction.
C. Section 06 1000 - Rough Carpentry: Wood blocking and nailers.
D. Section 09 3000 - Tiling: Tile base.
E. Section 11 5700 - Vocational Shop Equipment: Lockers at Shop.

1.03 REFERENCE STANDARDS

A. ADAAG - Americans with Disabilities Act, Accessibility Guidelines; current edition.
B. ASTM A 879/A 879M - Standard Specification for Steel Sheet, Zinc Coated by the Electrolytic Process for Applications Requiring Designation of the Coating Mass on Each Surface; 2006.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Manufacturer's data sheets on each product to be used, including:
    1. Preparation instructions and recommendations.
    2. Storage and handling requirements and recommendations.
    3. Installation methods.
C. Shop Drawings: Show the following:
    1. Dimensioned drawings including plans, elevations, and sections to show locker locations and interfaces with adjacent substrates.
    2. Details of assembly, erection, anchorage and clearance requirements.
    3. Field verify all locker space dimensions as a part of submittal process.
D. Samples: Submit two samples 3 x 6 inches in size, of each color selected; applied to specified base metal.
E. Manufacturer's Installation Instructions: Indicate component installation assembly.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Store products in manufacturer's unopened packaging until ready for installation.
B. Protect locker finish and adjacent surfaces from damage.

1.06 GUARANTEE

A. The Contractor shall guarantee his work for a period of 5 years from date of Substantial Completion. Guarantee shall be on form included in Section 01 7800.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Basis of Design Manufacturer:
   1. Penco Products, Inc: www.pencoproducts.com.
      a. Standard Duty Lockers: Vanguard.
      b. Heavy Duty Athletic Lockers: Invincible II.

B. Other Approved Manufacturers.
   1. Art Metal Products: www.artmetalproducts.com.
   2. Lyon Workspace Products: www.lyonworkspace.com.
   3. Republic Storage Systems Co: www.republicstorage.com.
   4. Debourgh Mfg. Company: www.debourgh.com.
   5. List Industries, Inc: www.listindustries.com.
   6. Hadrian, Inc.: www.hadrian-inc.com.
   7. Substitutions: See Section 01 6000 - Product Requirements.

2.02 MATERIALS

A. Steel: Sheet steel components shall be fabricated using zinc-coated steel free from surface imperfection, capable of taking a high-grade enamel finish and in compliance with ASTM A 879.

B. Hooks: Zinc plated forged steel, ball ends.

C. Bolts and Nuts: Zinc plated truss fin head bolts and hex nuts.

2.03 STANDARD DUTY LOCKERS (CORRIDORS, KITCHEN)

A. Locker Units:
   1. Width: 12 inches (300 mm).
   2. Depth: 15 inches (380 mm).
   3. Height: 72 inches (1830 mm).
   4. Configurations: Single and Double Tier as shown in Drawings.
   5. Locking:
      a. Corridors: Built-in combination lock (provide Combination Administration Software).
      b. Kitchen: Combination padlock hasps.
   6. Base: Fabricate for concrete base.
      a. Base Height: 6 inches (150 mm).

B. Tops, Bottoms, Backs, Sides, and Shelves: 24 gauge sheet steel.

C. Locker Body: Steel specially formed for added strength and rigidity and to ensure tight joints at fastening points.
   1. Tops and bottoms with three sides formed 90 degrees, the front offset formed to be flush with horizontal frame member.
   2. Shelves with four sides formed to 90 degrees, front edge having a second bend.
   3. Hole Spacing in Locker Body Construction: Not exceeding 9 inches (225 mm).
   4. Form door frame members to a channel shape, not less than 16 gauge steel.
   5. Provide vertical door frame members with additional 3/8 inch (9.5 mm) flange as a continuous door strike.
   6. Mortise and tenon intermembering parts; factory rivet together in a rigid assembly capable of resisting strains.
   7. Securely rivet cross frame members of channel shapes to vertical framing members to ensure rigidity, including intermediate cross frame on double and triple tier lockers.
   8. Center Partitions: 24 gauge steel vertical partitions, full depth between bottom and shelf.

D. Locker Doors: 16 gauge sheet steel.

1. Multi-Point Latch Doors: Full channel formation of adequate depth to fully conceal lock bar on lock side, channel formation on hinge side, right angle formations across top and bottom, with holes for attaching number plates.
2. Doors over 15 inches (380 mm) wide by 60 inches (1.524 m) or 72 inches (1.828 m) high: 3 inch (75 mm) wide 20 gauge full height reinforcing pan welded to inside face of door at 6 inch (150 mm) centers.
3. Ventilation: Standard louvered pattern at top and bottom of door.

E. Hinges:
1. 16 gauge, 0.0625 inch (1.58 mm) thick sheet steel, continuous type hinge riveted to the frame and welded to the door.

F. Door Handles and Latching:
1. Classic III Multi-point Latching with Recessed Handles:
   a. Recess finger-lift control handle in door.
   b. Pocket: 22 gauge brushed stainless steel securely fastened to door with two tabs and a positive tamper-resistant decorative fastener; of depth sufficient to prevent a combination padlock or built-in combination lock from protruding beyond door face.
   c. Provide lock hole cover plate for use with padlocks.
   d. Attach 14 gauge formed steel lifting piece to latching channel with one concealed retaining lug and one rivet, assuring a positive two-point connection.
   e. Handle Finger Lift: Molded, sound-deadening, attached with rivet; padlock eye for use with 9/32 inch (7.1 mm) diameter padlock shackle.
   f. Latch Clip: Glass-filled nylon engaging the door frame and holding the door shut.
      1) Doors 60 inches (1.524 m) and 72 inches (1.828 m) high: Three points.
      2) Doors 20 inches (0.508 m) to 48 inches (1.22 m) high: Two points.
   g. Locking Device: Positive, automatic type, whereby locker may be locked when open, then closed without unlocking.
   h. Firmly secure one rubber silencer in frame at each latch hook.

G. Interior Equipment:
1. ADA-Compliant Lockers:
   a. Single Tier Lockers: Hat shelf 48 inches (1.219 m) maximum off the floor.
   b. Locker Bottom: Minimum of 9 inches (230 mm) off the floor, or an extra shelf placed 9 inches (230 mm) off the floor for side access or minimum of 15 inches (381 mm) off the floor for front access.
   c. Handicapped symbol attached to door.
   d. Hooks as specified for other lockers.
2. Lockers:
   a. Single Tier: Shelf located approximately 9 inches (228 mm) below top of locker.
   b. Single and Double Tier: Three single prong wall hooks.

H. Accessories:
1. Number Plates: Provide each locker with a polished aluminum number plate, 2-1/4 inches (57 mm) wide by 1 inch (25 mm) high, with black numerals not less than 3/8 inch (9.5 mm) high; attach to face of door with two aluminum rivets.
2. Locks: Built-in three-number dialing combination locks capable of at least five different combinations changes; provide master key, combination change key, and combination control charts.
3. Continuous Sloped Hoods: 16 gauge steel, slope rise equal to 1/3 of the locker depth (18.5 degrees), plus a 1 inch (25 mm) vertical rise at front.
   a. Supplied in 72 inch (1829 mm) lengths only.
   b. Slip joints without visible fasteners at splice locations.
   c. Provide necessary end closures.
   d. Finish to match lockers.

4. Finished End Panels: Minimum 16 gauge steel formed to match locker depth and height, 1 inch (25 mm) edge dimension; finish to match lockers; install with concealed fasteners.
5. Front Fillers: 20 gauge steel formed in an angle shape, with 20 gauge slip joint angles formed in an angle shape with double bend on one leg forming a pocket to provide adjustable mating with angle filler.
    a. Attachment by means of concealed fasteners.
    b. Finish to match lockers.

2.04 HEAVY DUTY ATHLETIC LOCKERS (STUDENT AND COACH)

A. Locker Units:
    1. Widths: 12 inches (300 mm) and 18 inches (450 mm).
    2. Depth: 12 inches (300 mm) and 18 inches (450 mm).
    3. Height: 72 inches (1830 mm).
    4. Configurations: Double tier.
    5. Locking: Combination padlock hasps.
    6. Base: Fabricate for concrete base, 6 inches (150 mm) high.
B. Locker Body Construction: Steel specially formed for added strength and rigidity and to ensure tight joints at fastening points.
    1. Sides, Bottoms, Tops, and Shelves:
        a. 16 gauge steel.
        b. Ventilation: 3/4 inch (19 mm) wide by 1-1/2 inch (38 mm) high diamond-shaped perforations.
    2. Backs: Solid 18 gauge steel.
    3. Tops and bottoms with three sides formed 90 degrees, the front offset formed to be flush with horizontal frame member.
    4. Shelves with four sides formed to 90 degrees, front edge having a second bend.
    5. Hole spacing in locker body construction: Not exceeding 9 inches (225 mm).
    6. Two- and three-tier lockers: Intermediate channel-shaped horizontal frame members attached to side frames with mortise and tenon construction, securely riveted.
C. Locker Doors: 14 gauge sheet steel.
    1. Multi-Point Latch Doors: Full channel formation of adequate depth to fully conceal lock bar on lock side, channel formation on hinge side, right angle formations across top and bottom, with holes for attaching number plates.
    2. Ventilation: 3/4 inch (19 mm) wide by 1-1/2 inch (38 mm) high diamond-shaped perforations.
D. Hinges: Continuous piano hinge for the full height of the door.
E. Door Handles and Latching:
    1. Classic III Multi-point Latching with Recessed Handles:
        a. Recess finger-lift control handle in door.
        b. Pocket: 22 gauge brushed stainless steel securely fastened to door with two tabs and a positive tamper-resistant decorative fastener; of depth sufficient to prevent a combination padlock from protruding beyond door face.
        c. Provide lock hole cover plate for use with padlocks.
        d. Attach 14 gauge formed steel lifting piece to latching channel with one concealed retaining lug and one rivet, assuring a positive two-point connection.
        e. Handle Finger Lift: Molded, sound-deadening, attached with rivet; padlock eye for use with 9/32 inch (7.1 mm) diameter padlock shackle.
        f. Latch Clip: Glass-filled nylon engaging the door frame and holding the door shut.
            1) Doors 60 inches (1.524 m) and 72 inches (1.828 m) high: Three points.
            2) Doors 20 inches (0.508 m) to 48 inches (1.22 m) high: Two points.

g. Locking Device: Positive, automatic type, whereby locker may be locked when open, then closed without unlocking.
h. Firmly secure one rubber silencer in frame at each latch hook.

F. Interior Equipment:
1. ADA-Compliant Lockers:
a. Single Tier Lockers: Hat shelf 48 inches (1.219 m) maximum off the floor for unobstructed forward and side reach.
b. Locker Compartment Bottom: Minimum of 15 inches (230 mm) off the floor, or an extra shelf placed 15 inches (381 mm) off the floor for unobstructed forward and side reach.
c. Handicapped symbol attached to door.
d. Hooks as specified for other lockers.
2. Athletic Lockers:
a. Single Tier: Shelf located approximately 9 inches (228 mm) below top of locker.
b. Single and Double Tier: Three single prong wall hooks.

G. Accessories:
1. Number Plates: Provide each locker with a polished aluminum number plate, 2-1/4 inches (57 mm) wide by 1 inch (25 mm) high, with black numerals not less than 3/8 inch (9.5 mm) high; attach to face of door with two aluminum rivets.
2. Continuous Sloped Hoods: 16 gauge steel, slope rise equal to 1/3 of the locker depth (18.5 degrees), plus a 1 inch (25 mm) vertical rise at front.
a. Supplied in 72 inch (1829 mm) lengths only.
b. Slip joints without visible fasteners at splice locations.
c. Provide necessary end closures.
d. Finish to match lockers.
3. Finished End Panels: Minimum 16 gauge steel formed to match locker depth and height, 1 inch (25 mm) edge dimension; finish to match lockers; install with concealed fasteners.
4. Front Fillers: 20 gauge steel formed in an angle shape, with 20 gauge slip joint angles formed in an angle shape with double bend on one leg forming a pocket to provide adjustable mating with angle filler.
a. Attachment by means of concealed fasteners.
b. Finish to match lockers.

2.05 FABRICATION

A. Fabricate lockers square, rigid, without warp, with metal faces flat and free of distortion.
B. Knock-Down Lockers: Fabricate lockers on the unit principle, each locker with individual door and frame, individual top, bottom, back, and shelves, with common intermediate divisions separating compartments. Verify dimensions and arrangement before fabrication.
C. Finish: Enamel powder coat paint finish electrostatically applied and properly cured to manufacturer's specifications for optimum performance. Finishes containing volatile organic compounds and subject to out-gassing are not acceptable. Locker exterior and interior shall be painted the same color.
1. Powder Coat Plus - Dry Thickness: 2 to 2.2 mils (0.05 to 0.055 mm).
2. Colors: 2 alternating custom colors as selected by Architect.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that prepared bases are in correct position and configuration.
B. Verify bases and embedded anchors are properly sized.

3.02 INSTALLATION

A. Install in accordance with manufacturer's instructions.
B. Install lockers plumb, level, and square.
C. Place and secure on prepared base.
D. Secure lockers with anchor devices to suit substrate materials. Minimum Pullout Force: 100 lb.
E. Bolt adjoining locker units together to provide rigid installation.
F. Coordinate with Division 23 for required openings through sloped tops to accommodate locker room ventilation.
G. Install end panels, filler panels, and sloped tops using concealed fasteners. Provide flush hairline joints against adjacent surfaces.
H. Install accessories.
I. Install benches by fastening bench tops to pedestals and securely anchoring to the floor using appropriate anchors for floor material.
J. Replace components that do not operate smoothly.

3.03 ADJUSTING

A. Adjust doors and latches to operate without binding. Verify that latches are operating satisfactorily.
B. Adjust built-in locks to prevent binding of dial or key and ensure smooth operation prior to substantial completion.
C. Replace components that do not operate smoothly.

3.04 CLEANING AND PROTECTION

A. Clean locker interiors and exterior surfaces.
B. Touch-up with factory-supplied paint and repair or replace damaged products before substantial completion.
C. Protect installed products until completion of project.

3.05 SCHEDULES - REFER TO DRAWINGS

END OF SECTION 10 5100

SECTION 10 5613

METAL STORAGE SHELVING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Furnish all labor, materials, equipment, tools and services required to fully complete all Metal Storage Shelving work as is indicated on the drawings and/or specified herein including, but not limited to, the following described items.
B. Double rivet bulky storage units
C. Shelving accessories.
D. Do not include sales tax, refer to Section 00 1115 - Advertisement for Prequalification of Bidders.

1.02 RELATED REQUIREMENTS

A. Section 06 1000 - Rough Carpentry: Blocking and reinforcement in walls for anchoring shelving units.
B. Section 04 2731 - Reinforced Unit Masonry: Anchors in walls for shelving units.
C. Section 09 2116 - Gypsum Board Assemblies: Blocking and reinforcement in walls for anchoring shelving units.

1.03 REFERENCE STANDARDS

A. ANSI MH28.1 - Specifications for the Design, Testing, Utilization, and Application of Industrial Grade Steel Shelving; 1982.
B. ASCE 7 - Minimum Design Loads and Associated Criteria for Buildings and Other Structures; Most Recent Edition Cited by Referring Code or Reference Standard.
C. ICC (IBC)-2009 - International Building Code; 2009.

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. Rated uniform shelf loads.
    2. Details of shelving assemblies, including reinforcement.
    3. Accessories.
    4. Substrate preparation instructions and recommendations.
    5. Storage and handling requirements and recommendations.
    6. Installation methods.
    7. Specimen warranty.
    8. Maintenance methods.
C. Test Reports: Provide independent agency test reports documenting compliance with specified structural requirements.
    1. In lieu of test reports, detailed drawings stamped and sealed by a Professional Engineer licensed in the State in which the Project is locatedwill be acceptable.
D. Shop Drawings: Indicate location, type, and layout of shelving, including lengths, heights, and aisle layout, and relationship to adjacent construction.
    1. Indicate methods of achieving specified anchoring requirements.
E. Selection Samples: For each finish product specified, color chips representing manufacturer's full range of available colors and finishes.

F. Warranty: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.
G. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 01 6000 - Product Requirements, for additional provisions.
   2. Extra Shelves: Two of each size .

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years of documented experience.
B. Installer Qualifications: Company specializing in performing the work of this section with minimum 3 years of documented experience and approved by manufacturer.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Inspect for dents, scratches, or other damage. Replace damaged units.
B. Store in manufacturer's unopened packaging until ready for installation.
C. Store under cover and elevated above grade.

1.07 WARRANTY

A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
B. Provide one year manufacturer warranty covering defects of manufacturing and workmanship and rust and corrosion.
C. The Contractor shall guarantee his work for a period of One (1) year from date of Substantial Completion. Guarantee shall be on form included in Section 01 7800.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Shelving Systems:
   1. Penco Products, Inc: www.pencoproducts.com.
   2. Lyon Workspace Products: www.lyonworkspace.com.
   3. Hallowell, Div. of List Industries, Inc: www.hallowell-list.com.
   4. Substitutions: See Section 01 6000 - Product Requirements.

2.02 SHELVING - GENERAL

A. See drawings for layout and sizes.
B. Shelving: Provide products tested to comply with ANSI MH28.1 for design criteria, lateral stability, shelf connections, and shelf capacity.
C. Seismic Design: Design for Seismic Design Category D requirements, ICC (IBC) 2018.
D. Anchors: Provide anchoring hardware to secure each shelving unit to floor and wall.
   1. Provide hardware of type recommended by manufacturer for substrate.
   2. See drawings for additional details of anchorage.

2.03 DOUBLE RIVET BULKY STORAGE UNITS

A. Shelving System: Steel post-and-beam type with heavy duty angle posts, tee posts, center supports, and channel beams for maximum stability and capacity, including shelving surfaces, hanger bar components, and all appropriate "X" and ladder bracing as needed for extra strength.
   1. Unit Width: as shown on drawings
   2. Shelf Capacity: Rated uniform load of 50 psf, minimum, tested in accordance with ANSI MH28.1.

3. Shelf Deflection: L/140, maximum, under rated uniform load.
4. Adjustability of Shelving: At intervals of 1 1/2 inches on center, minimum.
5. Unit Depth: As shown on drawings.
6. Shelves per Unit: Four.
7. Unit Height: 84 inches, overall .
8. Finish: Manufacturer's standard baked poweder coat enamel finish.
9. Color: As selected by Architect from manufacturer’s full range.
10. Number of Units: As indicated on drawings.

B. Posts and Beams: Formed sheet members.
1. Metal Thickness: 16 gauge (1.65 mm).
2. Post Shape: Tee intermediate posts, angle end posts forming corners.
3. Tee Post Size: 3 3/4 inches by 1 7/8 inch (98 mm by 48 mm).
4. Angle Post Size: 1 7/8 inch by 1 7/8 inch (48 mm by 48 mm).
5. Beam Shape: Channel.
6. Beam Size: 3 inches by 1 inch (75 mm by 25 mm).
7. Connecting Hardware: Rivets.
8. Post Bases: Flat steel foot plates .

C. Shelves: 5/8 inch (16 mm) thick particle board decking covered with thermo-fused melamine on both sides.

D. Product: RivetRite Double Rivet Bulky Storage Units manufactured by Penco Products, Inc.

2.04 ACCESSORIES

A. Kick Plates: Formed sheet metal; enclose open space between bottom shelf and floor on all front sides and open ends; finished to match.

B. Shelf Partitions: Steel, full height.
1. Height: 3 inches.
2. Finish: To match shelving units.
3. Mounting: Slide-on.

C. Label Holders: Steel, attached to front face of shelf.
1. Size: 2-1/4 by 3/4 inches.
2. Finish: Manufacturer’s standard.
3. Mounting: Slide-on.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that substrate is level and that clearances are as specified.

B. Verify that walls are suitable for shelving attachment.

C. Do not begin installation until substrates have been properly prepared.

D. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.02 PREPARATION

A. Clean surfaces thoroughly prior to installation.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.03 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Anchor and reinforce as specified and as recommended by manufacturer for seismic requirements.

C. Install shelving with shelf surfaces level and vertical supports plumb; adjust feet and bases as required.

3.04 CLEANING

A. Clean shelving and surrounding area after installation.

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 10 5613

SECTION 10 7300

INSULATED TRANSLUCENT FIBERGLASS SANDWICH PANEL STRUCTURAL CANOPY SYSTEM

PART 1 GENERAL

1.01 SUMMARY

A. Section includes the structural canopy system as shown and specified. Work includes providing and installing:
   1. Structural aluminum box beam superstructure
   2. Factory prefabricated structural insulated translucent sandwich panels.
   3. Aluminum installation system.

B. Alternate No.1 - Refer to Section 01 2300 - Alternates.
   1. Base Bid - Not Included.
   2. Alternate - Insulated Translucent Fiberglass Sandwich Panel Structural Canopy System.

C. Related Sections:
   1. Section 03 3000 - Cast-in-Place Concrete: Footings and foundations

1.02 SUBMITTALS

A. Submit manufacturer’s product data. Include construction details, material descriptions, profiles and finishes of components.

B. Submit shop drawings. Include plans, elevations and details.

C. Submit manufacturer’s color charts showing the full range of colors available for factory finished exposed aluminum.
   1. When requested, submit samples for each exposed finish required, in same thickness and material indicated for the work and in size indicated below.
      a. Sandwich panels: 7 inch by 12 inch units.
      b. Factory finished aluminum: 3-inch-long sections.

D. Submit Installer Certificate, signed by installer, certifying compliance with project qualification requirements.

E. Submit product reports from a qualified independent testing agency indicating each type and class of panel system complies with the project performance requirements, based on comprehensive testing of current products. Previously completed reports will be acceptable if for current manufacturer and indicative of products used on this project.
   1. Reports required (if applicable) are:
      a. Flame Spread and Smoke Developed (((UL 723))) – Submit UL Card
      b. Burn Extent (((ASTM D635)))
      c. Color Difference (((ASTM D2244)))
      d. Impact Strength (((UL 972)))
      e. Bond Tensile Strength (ASTM C 297 after aging by ((ASTM D1037)))
      f. Bond Shear Strength (((ASTM D1002)))
      g. Beam Bending Strength (((ASTM E72)))
      h. Insulation U-Factor (((NFRC 100)))
      i. Fire Penetration of Exterior Wall Assemblies Using a Direct Flame Impingement Exposure (((ASTM E2707)))
      j. Fall Through Resistance (((ASTM E661)))
      k. Class A Roof Covering Burning Brand (((UL 790)))
      l. UL Listed Class A Roof System (((UL 790)))

1.03 CLOSEOUT SUBMITTALS

A. Provide project maintenance manuals.

1.04 QUALITY ASSURANCE

A. Manufacturer's Qualifications:
   1. Material and products shall be manufactured by a company continuously and regularly employed in the manufacture of specified materials for a period of at least ten consecutive years and which can show evidence of those materials being satisfactorily used on at least six projects of similar size, scope and location. At least three of the projects shall have been in successful use for ten years or longer.
   2. Panel system must be listed by an ANSI accredited Evaluation Service, which requires quality control inspections and fire, structural and water infiltration testing of sandwich panel systems by an accredited agency.
   3. Quality control inspections shall be conducted at least once each year and shall include manufacturing facilities, sandwich panel components and production sandwich panels for conformance with AC177 "Translucent Fiberglass Reinforced Plastic (FRP) Faced Panel Wall, Roof and Skylight Systems" as issued by the ICC-ES.

B. Single Source: Obtain primary and secondary components and structural framing members, translucent fiberglass roof panels, clips, closures, and other accessories from a single manufacturer to operate as a complete system for the intended use.

C. Installer's Qualifications: Installation shall be by an experienced installer, which has been in the business of installing specified panel systems for at least two consecutive years and can show evidence of satisfactory completion of projects of similar size, scope and type.

1.05 PERFORMANCE REQUIREMENTS

A. The manufacturer shall be responsible for the configuration and fabrication of the complete canopy system, including the aluminum box beam superstructure.
   1. When requested, include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
   2. Structural Loads; Provide canopy system capable of handling the following loads:
      a. Roof Live Load, on horizontal projected surface: 20 PSF.
      b. Roof Snow Load, on horizontal projected surface:25 PSF (includes unheated factor).
      c. Roof Snow Drift Load, on horizontal projected surface: 0 PSF.
      d. Base Wind Load +/-25 PSF (Strength Level).

B. Deflection Limits:
   1. Canopy Panels: Limited to l/60 of clear span.

C. Thermal Movements: Allow for thermal movements from ambient- and surface-temperature changes. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
   1. Temperature Change (Range): 110 degrees Fahrenheit, ambient; 150 degrees Fahrenheit, material surfaces.

1.06 DELIVERY, STORAGE AND HANDLING

A. Deliver canopy system, components and materials in manufacturer's standard protective packaging.

B. Store canopy system panels on the long edge; several inches above the ground, blocked and under cover in accordance with manufacturer's storage and handling instructions.

1.07 WARRANTY

A. Provide manufacturer's and installer's written warranty agreeing to repair or replace canopy system work, which fails in material or workmanship within one year from the date of delivery. Failure of material or workmanship shall include deterioration of finish on metal in excess of normal weathering and defects in accessories, insulated translucent sandwich panels and other components of the work.
B. The Contractor shall guarantee his work for a period of One (1) year from date of Substantial Completion. Guarantee shall be on form included in Section 01 7800.

PART 2 PRODUCTS

2.01 MANUFACTURER

A. Bais of Design Manufacturer:
   1. Structures Unlimited, Inc., Tel: (800) 225-3895 – Fax: (603) 627-0798 – Email: info@structuresunlimitedinc.com.
   2. Substitutions: See Section 01 6000 - Product Requirements.

2.02 PANEL COMPONENTS

A. Face Sheets:
   1. Translucent faces: Manufactured from glass fiber reinforced thermoset resins, formulated specifically for architectural use.
      a. Thermoplastic (e.g. polycarbonate, acrylic) faces are not acceptable.
      b. Face sheets shall not deform, deflect, or drip when subjected to fire or flame.
   2. Interior face sheets:
      a. Flame spread: Underwriters Laboratories (UL) listed, which requires periodic unannounced retesting, with flame spread rating no greater than 10 and smoke developed no greater than 350-400 when tested in accordance with UL 723.
      b. Burn extent by ASTM D635 shall be no greater than 1 inch.
   3. Exterior face sheets:
      a. Color stability: Full thickness of the exterior face sheet shall not change color more than 3 CIE Units DELTA E by ASTM D2244 after 3 years outdoor South Florida weathering at 5 degrees facing south, as measured on a white sample with and without a protective film or coating to ensure long-term color stability. Color stability shall be unaffected by abrasion or scratching.
      b. Strength: Exterior face sheet shall be uniform in strength, impenetrable by handheld pencil and repel an impact minimum of 70 feet lbs. without fracture or tear when impacted by a 3-1/4 inch diameter, 5 lb. free-falling ball per UL 972.
      c. Erosion Protection: Integral, embedded-glass erosion barrier.
   4. Appearance:
      a. Exterior face sheet: Smooth, .070 inch thick and white in color.
      b. Interior face sheet: Smooth, .045 inch thick and White in color.
      c. Face sheets shall not vary more than ± 10 percent in thickness and be uniform in color.
B. Grid Core:
   1. Aluminum I-beam grid core shall be of alloy and temper recommended by manufacturer with provisions for mechanical interlocking of muntin-mullion and perimeter. Width of I-beam shall be no less than 7/16 inch.

2.03 PANEL CONSTRUCTION

A. Provide sandwich panels of flat fiberglass reinforced translucent face sheets laminated to a grid core of mechanically interlocking I-beams. The adhesive bonding line shall be straight, cover the entire width of the I-beam and have a neat, sharp edge.
   1. Thickness: 2-3/4 inch.
   2. Grid pattern: staggered.

B. Standard panels shall deflect no more than 1.9 inch at 30 PSF in 10'-0" span without a supporting frame by ASTM E72.

C. Panels shall meet the conditions of acceptance according to ASTM E2707 Fire Penetration of Exterior Wall Assemblies Using a Direct Flame Impingement Exposure:
   1. Absence of flame penetration through the wall assembly at any time.
   2. Absence of evidence of glowing combustion on the interior surface of the assembly at the end of the 60-min observation period.
   3. Absence of evidence of flame, glow, and smoke if the test is terminated prior to the completion of the 60-min observation period.

D. Canopy System:
   1. Roof system shall pass Class A Roof Burning Brand Test by UL 790.

E. Canopy System shall meet the fall through requirements of OSHA 1910.21 as demonstrated by testing in accordance with ASTM E661, thereby not requiring supplemental screens or railings.

2.04 BATTENS AND PERIMETER CLOSURE SYSTEM

A. Closure system: Extruded aluminum 6063-T6 and 6063-T5 alloy and temper clamp-tite screw type closure system.

B. Sealing tape: Manufacturer's standard, pre-applied to closure system at the factory under controlled conditions.

C. Fasteners: Various series stainless steel screws for aluminum closures, excluding final fasteners to the building.

D. Finish: Manufacturer's factory applied finish, which meets the performance requirements of AAMA 2604. Color shall be selected by architect from manufacturers standard colors.

2.05 SUPERSTRUCTURE

A. The superstructure shall be pre-fabricated of extruded aluminum alloy 6005-T5, 6005A-T61 or 6061-T6 box beams. Ferrous metals shall not be allowed. All parts shall be pre-assembled at the factory and knocked down for shipment. System shall be a rigid frame design.

B. Finish: Manufacturer's factory applied finish, which meets the performance requirements of AAMA 2604. Color shall be selected by architect from manufacturers standard colors.

C. Aluminum structural system design and calculations must be furnished in accordance with the Aluminum Association "Specifications for Aluminum Structures" and the applicable building code. Design calculations must be prepared and stamped by a Licensed Professional Engineer.

PART 3 EXECUTION

3.01 EXAMINATION

A. Installer shall examine substrates, supporting structure and installation conditions.

B. Do not proceed with structural canopy installation until unsatisfactory conditions have been corrected by the general contractor.

3.02 PREPARATION

A. Metal Protection:

1. The general contractor shall prepare foundations, piers, curbs, footings and/or lintels isolating dissimilar materials from aluminum system, which may cause electrolysis.
2. Where aluminum will contact dissimilar metals, protect against galvanic action by painting contact surfaces with primer or by applying sealant or tape recommended by manufacturer for this purpose.
3. Where aluminum will contact concrete, masonry or pressure treated wood, protect against corrosion by painting contact surfaces with bituminous paint or method recommended by manufacturer.

B. The general contractor shall install foundations, piers, curbs, footings and/or lintels designed to withstand the thrust generated by the canopy.

C. The general contractor shall provide temporary enclosures if required.

3.03 INSTALLATION

A. Install the canopy system in accordance with the manufacturer's installation recommendations and approved shop drawings.

B. After other trades have completed work on adjacent material, carefully inspect translucent panel installation and make adjustments necessary to ensure proper installation.

3.04 CLEANING

A. Refer to manufacturer's written recommendations.

END OF SECTION 10 7300

This page intentionally left blank

SECTION 10 7500

FLAGPOLES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Furnish all labor, materials, equipment, tools and services required to fully complete all Flagpole work as is indicated on the drawings and/or specified herein including, but not limited to, the following described items.
B. Aluminum Flagpoles and Flags.
C. Do not include sales tax, refer to Section 00 1115 - Advertisement for Prequalification of Bidders.

1.02 RELATED REQUIREMENTS

A. Section 03 3000 - Cast-in-Place Concrete: Concrete base and foundation construction.
B. Dvision 26 - Electrical connection.

1.03 REFERENCE STANDARDS

A. AASHTO M 36 - Standard Specification for Corrugated Steel Pipe, Metallic-Coated, for Sewers and Drains; 2016.
B. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2017.
C. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2021.
D. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric); 2021.
E. NAAMM FP 1001 - Guide Specifications for Design Loads of Metal Flagpoles; 2007.

1.04 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. Maintenance Data: Provide lubrication and periodic maintenance requirement schedules.

1.05 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.

1.06 GUARANTEE

A. The Contractor shall guarantee his work for a period of One (1) year from date of Substantial Completion. Guarantee shall be on form included in Section 01 7800.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Basis of Design Manufacturer:
    1. Concord Industries, Inc; Product - "Titan Series": www.concordamericanflagpole.com.

B. Other Approved Manufacturers:
   1. American Flagpole: www.americanflagpole.com.
   2. Pole-Tech Co., Inc: www.poletech.com.
   3. Admiral Flag Poles : www.admiralflagpoles.com.
   4. Eder Flagpole Co.: www.ederflag.com.
   5. Morgan-Francis Flagpoles: www.morgan-francis.com.
   6. Substitutions: See Section 01 6000 - Product Requirements.

2.02 FLAGPOLES

A. Flagpoles: Designed in accordance with NAAMM FP 1001
   1. Material: Aluminum with standard satin aluminum finish.
   2. Design: Cone tapered.
   3. Mounting: Ground mounted type.
   4. Nominal Wall Thickness: 0.188 inches.
   5. Nominal Height: 35 ft; measured from nominal ground elevation.
   6. Halyard: Internal haylard winch and wire system with flush mount hinged door design
B. Performance Requirements:
   1. Wind Pressure Loading on Flagpole with Flag: Resistant without permanent deformation to 90 miles/hr wind speed, in accordance with NAAMM FP 1001; the factor of safety used is 2.5.

2.03 POLE MATERIALS

A. Aluminum: ASTM B221 (ASTM B 221M) , 6063 alloy , T6 temper.

2.04 ACCESSORIES

A. Finial Ball: Aluminum, 6 inch diameter, gold anodized with deep luster finish.
B. Truck Assembly: Cast aluminum; revolving, stainless steel ball bearings.
   1. Dual light beacon plus
      a. 3000k LED lights; 572 lumens.
      b. Power: 110v/120v input; 12v output.
C. Flag: USA Flag - 5 ft by 8 ft size, nylon fabric, brass grommets, hemmed edges.
D. Halyard Flag Snaps: Provide four chromium-plated bronze swivel snap hooks per halyard.
   1. Provide with neoprene or vinyl covers.

2.05 MOUNTING COMPONENTS

A. Foundation Tube Sleeve: AASHTO M 36, corrugated 16 gage, 0.0598 inch steel, galvanized .
   1. A steel base plate with the square dimension at least twice the butt diameter of the shaft shall be provided.
   2. The thickness of the base plate shall bee 1/2 inch (13 mm).
   3. A setting plate of the same thickness at the base plate shall be provided in a size that is half the size of the base plate.
   4. The setting plate shall be securely welded to the ground spike at least 4 inches (102 mm) below the base plate.
   5. The ground spike shall be 3/4 inch (19 mm) diameter, not less that 18 inches (457 mm) long.
B. Collar:
   1. The flash collar, or ornamental base, shall be cast aluminum, Type FC-11.
   2. The diameter of the collar shall be at least 1 inch larger than the diameter of the foundation sleeve.
   3. The finish shall be "deep luster."

2.06 FINISHING

A. Metal Surfaces in Contact With Concrete: Asphaltic paint.
B. Concealed Steel Surfaces: Galvanized to ASTM A123/A123M requirements.
C. Exposed to View Steel Surfaces: Galvanized to ASTM A123/A123M requirements.
D. Aluminum: Deep luster finish with heavy wax coating.
E. Stainless Steel: No. 4 satin finish.
F. Finial: Gold anodized 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. Electrically ground flagpole installation.
C. Install foundation plate and centering wedges for flagpoles base set in concrete base and fasten.

3.04 TOLERANCES

A. Maximum Variation From Plumb: 1 inch.

3.05 ADJUSTING

A. Adjust operating devices so that halyard and flag function smoothly.

END OF SECTION 10 7500

This page intentionally left blank

SECTION 11 0600

STAGE RIGGING AND LIGHTING CONTROL SYSTEMS

PART 1 – GENERAL

1.1 Intent

A. The intent of this specification is to define parameters for furnishing and installing a complete working system to the owner. The system is designed to meet specific operational requirements of Riverview Junior High School. Performance deviations will not be accepted.

1.2 Related Sections

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification sections, apply to work of this section.

B. Additional sections that apply to the work of this section include:

1. 26 0500 Electrical General Provisions
2. 26 0507 Electrical Connections for Equipment
3. 26 0519 Conductors and Cables
4. 26 0526 Grounding
5. 26 0529 Supporting Devices
6. 26 0532 Conduit Raceway

1.3 Scope

A. THE SCOPE OF THIS WORK INVOLVES THE FOLLOWING:

1. Complete and timely submission of all required submittal documents.
2. Coordination of stage equipment with all other trades.
3. Provide (4) 24 circuit relay panels for the Auditorium; installation and electrical connection by Division 26 contractor.
4. Provide (1) 24 circuit relay panels for the Little Theatre; installation and electrical connection by Division 26 contractor.
5. Provide and install an architectural lighting control processor for control of house lighting in both the Auditorium and Little Theatre. Electrical connections by Division 26 contractor.
6. Provide an emergency lighting transfer switch and emergency DMX bypass for emergency fixtures in Auditorium and Little Theatre; installation and electrical connection by Division 26 contractor.
7. Provide, install and program lighting control consoles.
8. Provide console outlets as indicated; installation and electrical connection by Division 26 contractor.
9. Provide new wiring devices as indicated; installation and electrical connection by Division 26 contractor.

10. All required control wiring provided and installed by division 26 contractor based on shop drawings and coordination with theatrical installer. Provide components necessary to make the system a working network. Actual length of network cabling and system layout shall be verified during the project approval process.

11. Provide and hang all theatrical lighting fixtures. Coordinate hanging locations of theatrical fixtures with the Owner. Provide accessories as indicated.

12. Provide all demonstrations as required on proper operation of all systems specified. Demonstration shall be video recorded and provided to the District with closeout documents

13. Provide all closeout documents, as-built drawing, warranties, operational manuals, and flameproofing certificates as specified.

B. Refer to responsibility matrix on sheet TH.01 for division of responsibility with Division 26 contractor. Any conflict between what is indicated in this matrix and this specification, the matrix shall take precedent.

1.4 Drawings

A. Drawings shall be furnished as follows:

1. Shop drawings and equipment data sheets shall be submitted to the Owner under general provisions within 90 days after award of the contract. Failure to comply with this 90-day requirement shall be cause for disqualification of the selected Contractor and cancellation of contract without cost to the Owner, on the basis that the selected Contractor does not have the ability or intention to comply with the specifications. Approval of submitted equipment shall be obtained prior to equipment purchasing or fabrication. If shop drawings are rejected, correct and resubmit in the manner as specified. All shop drawing information shall be submitted at the same time; no partial submittal will be accepted. Drawings shall indicate complete details, dimensions, product types and locations of all equipment, clearances required, guides, cables, sets, Contractor fabricated equipment, and all other details required to completely describe the work to be performed. Submittals drawings shall be presented at a scale of not less than ⅛" = 1'-0" for conduit plans, ¼" for equipment layouts, ½" = 1'-0" for mounting details, and ½" = 1'-0" for plate and panel details. Each sheet to allow space for approval stamps and have the name of the project, the contractors and/or the supplier's name, address telephone number, and the date submitted. Provide product information or drawings on all equipment to be supplied and installed. All product catalog sheets shall be provided in PDF format. Arrange this portion of the submittal in a logical sequence and include the following sections:

   a. Auditorium Dimming and Controls

   b. Auditorium Theatrical Lighting Fixtures

   c. Miscellaneous Equipment

2. In addition, submit the following items for Architect/Owner's approval, prior to fabrication:

   a. Electrical riser diagrams indicating the necessary power and control wiring for all motorized rigging. Provide tag number for every connection. Show all terminal blocks with wire numbers and location.

   b. Plan and elevation views indicating all electrical hardware locations and layout (all rooms).

   c. Provide full dimensions for panel layouts with finishes and materials for all custom panels.

d. Details of installation and erection, including adjoining conditions and necessary clearances.

e. Indication by arrow and boxed caption of each variation from contract drawing and specifications, except those indicated as acceptable in specifications or on drawings.

1.1 Record Drawings and Data

A. Submit in accordance with General Provisions. Also, within 30 days of final test and completion of the installation, submit the following to the Owner:

1. Three (3) complete sets of "as built and approved" drawings (rolled, not folded showing systems and elements as installed, including field modifications and adjustments.

2. Three (3) sets of maintenance data including a list indicating replacement parts lists for all items of equipment, wiring diagrams, control diagrams, any and all keys for cabinets, racks, key operated switches etc. and complete operation manuals.

1. Three (3) Certificates of Guarantee

2. Electrical distribution drawings of the Auditorium in plan view (1/4" = 1'-0") indicating all electrical outlets and their corresponding circuit number dry-mounted to foam board and framed under non-glare glass and mounted on the wall in the control booth

1.2 Quality Assurance

A. To ensure a uniform installation and single responsibility, the lighting control system shall be provided and warrantied by a single manufacturer. This manufacturer shall have manufactured electronic lighting controls for a minimum of 10 years. Companies who assemble dimming racks or banks from components supplied by others, even if that component is private labeled, are excluded from this bid. Mixing of equipment brands shall not be acceptable.

B. The manufacturer shall have a factory authorized service provider with at least one full time manufacturer certified service technician on staff located within 50 miles of the job site. In addition, the manufacturer shall provide a 24-hour service hotline.

1.3 Standards

A. All equipment, where applicable standards have been established, shall be built to the standards of Underwriters Laboratories, Inc., the National Electric Code, and the United States Institute for Theater Technology. Approved equipment shall be so labeled on delivery to the job site.

1.4 Installer Qualifications

A. The installer shall be fully experienced in the fabrication and installation of the stage equipment as herein specified. The Contractor shall have been in business for five (5) full years preceding the date of this bid doing work similar to the type specified and under the same name. The Contractor shall employ only fully trained stage riggers and mechanics for the erection of the stage equipment. The stage riggers shall be completely familiar with the type of equipment to be installed. A competent Job

Superintendent shall be on the job at all times when work is in progress. He shall represent the Contractor and all directions given by him shall be as binding as if given by the Contractor.

B. In effort to attain competitive bids on the system the following installers shall be solicited for bid of the Theatrical Lighting Systems

1. Oasis Stagewerks – SLC, UT
   a. www.oasisstage.com
   b. Tim Hansen – thansen@oasis-stage.com – 801.363.0364
2. Barbizon Light of the Rockies
   a. www.barbizon.com
   b. Peter Maurelli - pdm@barbizon.com – 303.394.9875 x 7107
3. Upstage Services – Clinton, UT
   a. www.upstagecompanies.com
   b. Burke Burkhardt - burke@upstagecompanies.com – 801.779.3030

1.5 Substitutions:

A. The equipment specified is the result of efforts on the part of the owner to select equipment for reliability, ease of maintenance and suitability for the owners' purposes. The theatrical rigging shall be by Electronic Theatre Controls, Inc. Theatrical lighting control equipment shall be by Electronic Theatre Controls, Inc or Strand Lighting. **Systems made up of components from multiple manufacturers are NOT acceptable and will not be considered.**

1. **The auditorium has been designed around the Electronic Theatre Controls Prodigy system by its design eliminate any horizontal loads on the structure. Any alternative rigging system shall also eliminate horizontal loads on the structure. If an alternate rigging system that introduces horizontal loads is proposed, the contractor shall be responsible for any costs associated with any structural redesign including redesign costs by structural engineer, additional material or labor costs and any possible rework costs.**

B. Proposals for equipment from other manufacturers, including those listed above, will be considered provided the equipment is provided/manufactured/warrantied by a single manufacturer, is fully digital in operation and sufficient documentation is submitted ten days prior to bid date to establish that it meets these specifications. Bidders seeking to use a manufacturer other than the approved list shall provide to the architect the following items: list of ten similar projects using the proposed hardware, the name of the project and a contact name and phone number. The price for alternate equipment must be identified as an alternate bid and the amount stated as an addition or deduction to the base bid.

C. Submittals shall include but not be limited to: complete Bill of Materials; one line control riser that identifies, by product name, all dimming and control equipment as well as wire types and counts; cutsheets on all proposed equipment showing full technical specifications, and a document identifying all deviations from this specification.

D. Any revision or addition to the wiring required by substitute equipment shall be the responsibility of the substituting contractor. This contractor shall also be responsible for

any additional architectural or engineering fees occasioned by the necessity of evaluating alternate proposals.

E. No exception shall be made to the requirement for optical isolation.

F. No deviation shall be permitted from the requirement for UL listing.

1.6 Fabrication

A. Fabrication shall begin only after approved drawings and a written notice to proceed have been delivered to the manufacturer at the manufacturer's place of business.

1.7 Energization

A. A qualified engineering representative certified by the manufacturer for system startups shall visit the job site after installation is complete and prior to the energization of the system to inspect, test and adjust the system. She/he shall also at that time instruct the owners' representatives in the operation and maintenance of the system. These services shall not exceed two days and shall be provided within 21 days written notice by the contractor.

1.8 Warranty

A. Electronic Theatre Controls, Inc. (ETC) warrants to the original owner that for a period of two years from date of energization of a permanently installed system, its products will be free from defects in materials and workmanship under normal use and service.

1.9 Manufacturer Services

A. Service shall be provided directly by the manufacturer and service calls shall be made within 24 hours.

PART 2 - ARCHITECTURAL CONTROL

2.1 Architectural Control Processor

A. Standards Compliance: cULus Listed. CE Compliant.

B. Functional:

1. Capacity:
    a. Channels of Control: 1,024.
    b. Stations: 128.
2. System:
    a. Net3 system interoperability including sACN.
    b. Network Time Protocol for real-time clock synchronization supporting real and astronomical events.

c. Two physical DMX ports, each configurable as an input or output.

d. Configuration of DRd dimming operations.

e. 12 control processors per system.

f. Addition of processors to a system proportionately increases the overall capacities.

3. Serial Input/Output:

a. Eight-bit word length, parity selection and one or two stop bits.

b. Fully customizable input and output messages.

c. Bi-directional.

4. Configuration Data:

a. Remote upload from a connected PC running LightDesigner or another connected Paradigm ACP.

b. Stored in removable solid-state memory for easy transfer to another Paradigm ACP.

5. Local User Interface:

a. Control functionality for control channels, zones, fixtures, groups, presets, macros, walls, and sequences.

b. Ability to schedule timed events (add/edit/delete).

c. Transfer of configuration using removable media.

d. Transfer of configuration to and from touchscreen stations using removable media.

6. User Access Controls: Two user accounts: Administrator and User. Local to each processor.

7. Web User Interface:

a. Internal web server accessible via Ethernet port.

b. Activate and deactivate presets.

c. Schedule timed events (add/edit/delete).

d. Displays status information and log files.

e. Configuration of processor settings.

f. Supports configurable user login security options.

8. Diagnostics: Standard and Critical Event logging.

9. Stations:

a. Connected to a Paradigm processor via topology-free LinkConnect, or star-topology NetConnect.

b. Discovery and binding accomplished from the local user interface or LightDesigner.

10. Operation:

a. Configurable DMX output refresh rate.

b. Support for 16-bit DMX attributes.

c. User configurable arbitration for multiple internal and external source data.

C. Mechanical:

1. For use in Unison DRd Rack Enclosure Series and Unison ERn Control Enclosure Series.
2. Microprocessor-based, solid-state technology provides multi-scene lighting and building controls.
3. Fully-contained plug-in module with no discrete wire connections.
4. Tool-free installation.
5. Front-panel user interface with backlit LCD and alphanumeric button panel.
6. RJ-45 Ethernet, Secure Digital (SD) and Universal Serial Bus (USB) media on front panel.

D. Electrical:

1. No discrete wiring connections required for use in a dimming or control enclosure.
2. Echelon LinkPower communications with remote devices, including button stations, button/fader stations, touchscreen stations, sensors, and third party LonMARK compliant products.
3. Hot swappable.
4. System configuration and programming stored in flash memory.
5. Support of ESTA BSR E1.17 Advanced Control Networks (ACN) and ESTA BSR E1.31 (sACN) Protocols.
6. EIA-RS232 serial protocol for bi-directional command and communication with third-party equipment.
7. Two discrete ESTA DMX512A ports, configurable as input or output ports.
8. User Datagram Protocol (UDP) messaging input and output for control of Paradigm or external systems.
9. Four dry-contact closure inputs.
10. Four contact-closure outputs rated 1 A at 30 VDC.

E. Operating Temperature Range: 32-104 degrees F (0-40 degrees C).

F. Relevant Humidity Non-Condensing: 10 to 90 percent.

2.2 External Control Enclosure

A. Dual Processor Enclosure-Rack Mount.

B. Standards Compliance: cULus Listed, CE Compliant.

C. General:

1. External Processing Enclosure designed for one or two control processors plus options and accessories.
2. Full 2-year Warranty.

D. Mechanical:

1. 18-gauge formed steel construction.
2. Fine-texture, scratch-resistant epoxy paint.
3. Wall-mount and 19 in rack-mount variants.
4. Rack-mount enclosure sizes: ERn2: 5U and ERn4: 8U.
5. Rack mount offers connectorized rear panel for all wiring connections.
6. Convection-cooled.
7. Hinged, Locking door with limited access to control processor. Integral electrostatic air filter.
8. Tool-free module removal and installation.
9. 19 in equipment-rack mount offers connectorized rear panel for all wiring connections.
10. Wall-mount offers front access wiring terminations.
11. Top, bottom, and side knockouts for conduit entry.

E. Electrical:

1. External control enclosure rated for 100 V, 120 V, 230 V CE or 240 V UL single phase configurations, 3.5 A maximum draw at 120 V.
    a. AC (single phase).
    b. 24 VDC (2-16 AWG).
    c. LinkConnect.
    d. Two configurable DMX512A ports.
    e. RS232 Bi-directional serial.
    f. Cat5/5e UTP Ethernet.
    g. Contact I/O, 4in/4out (14 to 26 AWG).
    h. Contact output rated 1 A at 30 VDC.
    i. Contractor-supplied input and control wiring.
    j. Factory-provided connectors for wiring terminations.

F. Operating Temperature Range: 32 to 104 degrees F (0 to 50 degrees C).

G. Relevant Humidity Non-Condensing: 10 to 90 percent.

2.3 TOUCHSCREENS:

A. 18 inch Touchscreen Control Station High-resolution interface, Configurable graphic interface with controls and information displays required for managing lighting systems.

1. Standards Compliance: UL and cUL LISTED. CE Compliant.
2. Functional:
    a. Built-in setup interface, separate from user configured pages.
    b. Configuration Upload from the Following Sources:

i. LightDesigner software.

ii. USB Flash Drive, via built in USB port.

c. SD media.

i. Ability to store multiple configurations and to select which configuration is active from an on-screen menu.

ii. Allows at least 30 separate control pages.

d. Control Functions:

i. Individual zone control.

ii. Preset record and selection.

iii. Room Combine Controls.

iv. Preset, color, sequence, macro, and custom function activation.

v. Change, initiate, or override timed events.

vi. Multi-level electronic lockout.

e. Custom controls configured from LightDesigner software.

f. Custom graphics configured from ControlDesigner software.

g. Supports Windows 7 and newer HID compliant Touchscreen Displays.

h. Software controlled lock-out and control visibility using up to 5 unique passcodes.

3. Mechanical:

a. Adjustable brightness and contrast for low light conditions.

b. Backlit, color 18.5 inch LCD display with capacitive touchscreen interface.

c. Resolution: 1366x768 WXGA TFT resolution.

i. Pixel Pitch: 300 vertical and horizontal.

ii. Luminance: 250 candles per sq m.

iii. Response Time: 5 ms.

iv. Viewing Angle: 170 degrees vertical, 160 degrees horizontal.

v. 100mm x 100mm VESA mountable.

d. Fanless operation.

e. Mounting: Rack-mount.

4. Electrical:

a. 120-240 VAC power Input to included 12 VDC power supply.

b. Built in over current and surge protection.

c. RJ-45 Socket for wiring over CAT 5/ 5e/ 6 standard Ethernet cable to the control system.

d. USB connectors for configuration and software upload.

5. Operating Temperature Range: 32 to 104 degrees F (0 to 40 degrees C).

6. Relevant Humidity Non-Condensing: 0 to 90 percent.

B. 7 inches Touchscreen

1. Standards Compliance: UL and cUL LISTED. CE Compliant.
2. Functional:
   a. Built-in setup interface, separate from user configured pages.
   b. Configuration Upload from the Following Sources:
      i. LightDesigner software.
      ii. USB Flash Drive, via built in USB port.
      iii. SD media.
   c. Ability to store multiple configurations and to select which configuration is active from an on-screen menu.
   d. Allows at least 30 separate control pages.
   e. Control Functions:
      i. Individual zone control.
      ii. Preset record and selection.
      iii. Room Combine Controls.
      iv. Preset, color, sequence, macro, and custom function activation.
      v. Change, initiate, or override timed events.
      vi. Multi-level electronic lockout.
   f. Custom controls configured from LightDesigner software.
   g. Custom graphics configured from ControlDesigner software.
   h. Supports Windows 7 and newer HID compliant Touchscreen Displays.
   i. Software controlled lock-out and control visibility using up to 5 unique passcodes.
3. Mechanical:
   a. Color LCD display with projected capacitive touchscreen interface with LED backlight.
   b. 178 degree horizontal and vertical viewing angle.
   c. Low-profile aluminum bezel finished in a fine-texture powder coat paint.
   d. No visible means of attachment.
   e. Manufacturer provided back boxes for surface and flush mount applications.
   f. Adjustable brightness and contrast for low light conditions.
   g. 7 inch WVGA, display (800x480).
4. Electrical:
   a. Connection to Paradigm Control System utilizes standard Ethernet (CAT5/ 5e).
      i. Powered by Power over Ethernet, PoE Class 2 (6-watts).
      ii. Requires ground wire.
5. Operating Temperature Range: 32 to 104 degrees F (0 to 40 degrees C).

6. Relevant Humidity Non-Condensing: 0 to 90 percent.

2.4 Button Stations

A. 1-gang, 1-button and 1-gang, 5-button.

1. Standards Compliance: cULus Listed. CE Compliant.
2. Mounting: Flush, Surface.
3. Functional:
   a. Button and keyswitch functions: preset selection, record mode activation, station lockout, raise, lower, macro activation, zone on/off control, timed-event override, and wall open/close or toggle.
   b. Custom button functionality programmable via LightDesigner configuration software.
   c. Programmable electronic lockout levels.
   d. Allows for programming of individual lockout levels.
4. Mechanical:
   a. Gangable for custom applications.
   b. Enclosed electronics assembly and faceplate included.
   c. Cantilevered switch arrays with removable caps.
   d. No visible means of attachment.
   e. Flush-mount in industry standard back box, RACO 690 or equivalent.
   f. Surface-mount backboxes available from manufacturer.
   g. Constructed of injection-molded, ABS plastic.
   h. Indelibly marked legends in a contrasting color.
   i. Integral RGB LED response indicator for each button.
   j. Integrated IR receiver.
   k. Unison Heritage Locking Cover.
5. Electrical:
   a. Connect via Echelon LinkPower control network utilizing low-voltage Class II wiring.
   b. Topology-free and polarity-independent wiring over Belden 8471 and one No. 14 ESD drain wire.
   c. Wiring may be bus, loop, home-run, or any combination of these.
   d. All station terminations are connectorized.
6. Operating temperature Range: 32 to 104 degrees F(0 to 40 degrees C).
7. Relative Humidity, Non-Condensing: 30 to 90 percent.

2.5 Dual Tech Occupancy/Vacancy Sensors.

A. Standards Compliance: UL and cUL Listed, CE Compliant.

B. Functional:

1. Supports software-configured Auto-On/Auto-Off functionality (occupancy sensing) or Manual-On/Auto-Off (vacancy sensing) functions.
2. Ceiling Sensor:
    a. 360-degree coverage pattern.
    b. Includes configurable coverage masks.
    c. Small Room: 450 sq. ft. at 8 ft ceiling, 800 sq. ft. at 12 ft ceiling.
    d. Large Room: 1800 sq. ft. at 8 ft ceiling, 3000 sq. ft. at 12 ft ceiling.
    e. High Ceiling: 300 sq. ft. at 10 ft ceiling, 7000 sq. ft. at 40 ft ceiling.
3. Supports walk-thru mode for verifying coverage area.
    a. Sensor lens illuminates for walk-thru and test mode operation.
4. Sensor coverage tested to NEMA WD 7-2000.

C. Mechanical:

1. Constructed of injection-molded, ABS plastic.
2. Electronics assembly and mounting accessories included.
3. Accessible configuration buttons.
4. No visible means of attachment.
5. Ceiling Mount:
    a. Surface- or box-mountable.
    b. Supports drywall, plaster, wood, and concrete mounting.
    c. Mounts to standard electrical box (supplied by others).
    d. Mounts to compressed fiber ceilings with included wire mounting option.

D. Electrical:

1. Connect via LinkConnect two-wire control network utilizing low-voltage Class 2 wiring.
    a. Topology-free and polarity-independent wiring over Belden 8471 or equivalent and one No. 14 ESD drain wire.
2. Wiring may be bus, loop, homerun, or any combination of these/

E. Operating Temperature Range: 32 to 104 degrees F (0 to 40 degrees C).

F. Relevant Humidity Non-Condensing: 10 to 90 percent.

G. Provide the following:

1. Refer to drawings for architectural control requirements.

PART 3 EMERGENCY CONTROL PRODUCTS

3.1 DMX Emergency Bypass Controller - 6-output

A. Model DEBC-6: DMX Emergency Bypass Controller, 6-output.

B. Capable of overriding a single universe of DMX512 control signals from "Normal" to "Bypass" when a trigger signal is detected via a contact closure trigger input.

1. Output to a single DMX output or up to six optically-isolated DMX outputs.
2. Poll bypass trigger input after a power loss and react upon start up.
3. Recalled immediately on restart if trigger is also applied at restart.

C. Capable of recording a single DMX preset (snapshot) of 512 channels for recall during "Bypass" mode.

D. Internally accessible, labeled DIP switches for configuration of:

1. DMX Record Mode: 512 channels. Selected channels, snapshot.
2. Contact Input Type: Normally open (default). Normally closed.
3. Wait Time for Restore incoming DMX; Bypass Trigger Removed: 0 Seconds (default). 10 second wait. 30 second wait. 10 minute wait.

E. Single Bypass Input Using Two Input Modes:

1. Bypass Triggering: Via a maintained contact input configurable for normally open (N.O.) or normally closed (N.C.) operation.
2. Contact Input: 12 VDC wet input for interface with fire alarm or secondary trigging systems.

F. Mechanical:

1. Surface Mounted Enclosure. Removable Front Cover: 16-gauge, formed steel.
2. Single Bi-Color LED Indicator: Visible from exterior of enclosure.
   a. Normal State: Green light when Power and DMX are present.
   b. Off indicates Power or DMX are not present.
   c. Bypass State: Red light. Includes bypass input contact trigger or 'test' active.
3. Test Button: Front enclosure accessible without removing panels.

a. Triggers bypass state if it is held down. Releases bypass state upon button release.

b. Button: Momentary only. Recessed to prevent accidental triggering.

4. Single, internally accessible button for DMX Record (snapshot) with an indicator LED for record action.

a. Record Button: Momentary only and held for 3 seconds before activation to prevent accidental recording.

b. LED indicator: Flashes rapidly when record function is active and illuminate steady when record function is complete.

G. Electrical: Internally pre-wired by Manufacturer.

1. Contractor to provide input feed and control wiring to terminals.

a. Input Power: 100 to 277 V, 50/60 Hz, 150 mA maximum current.

2. Labeled terminations for two 24 to 0 AWG solid or stranded power wires.

3. One Grounding Lug for 24 to 14 AWG solid or stranded ground wire.

4. Labeled, socketed termination connections for DMX Input and Output wiring.

a. Terminations support Belden 9729, 1583A Category 5 cable, or equivalent.

5. Labeled, socketed termination for bypass contact input.

a. Termination to support two, 30 to 12 AWG low-voltage wires.

b. Bypass Input: To maintained normally open (N.O.) or normally closed (N.C.) dry contact input.

c. Wet Contact Input: 12 VDC for fire alarm system interface.

d. Socketed DMX transceiver chips.

i. Spare chip in labeled, inactive socket.

6. Internally switch from normal DMX input (pass through) to bypass DMX output using electromechanical relays when triggered.

a. Non-Volatile Memory: For storage of single recorded sequence of 512 channels.

i. Recorded sequence to persist through power outages.

ii. Default Sequence: 512 channels at "full" if no sequence is recorded.

b. DMX Baud Rate: "Slow," 20 packets per second for increased compatibility during bypass DMX output.

7. Two versions capable of output to a single DMX line or up to six optically-isolated DMX lines.

8. Standards Compliance: UL and cUL Section 924 Listed for interaction with similarly listed products.

H. Room Operating Temperature: 32 to 104 degrees F (0 to 40 degrees C).

I. Humidity Non-Condensing: 10 to 95 percent.

3.2 Emergency Bypass Detection Kit

A. Standards Compliance: UL and cUL Section 924 Listed.

B. Surface Mounted Enclosure. Removable Front Cover: 16-gauge, formed steel.

1. Finish: Fine textured, scratch-resistant, powder coat paint.

C. Breaker: 3 pole, 10 amp for local over-current protection and simulation of normal power loss.

D. Lockable Door: Limits access to over-current protection breaker.

E. Components to be properly treated and finished.

F. Discrete high and low voltage wiring compartments with voltage barrier.

G. Accessories:

1. Emergency Bypass Detection Tap Kit
   a. Fused over-current protection for sense feed wiring without need for external circuit breaker.
   b. Install within an ETC Unison DRd Enclosure.

H. Electrical:

1. Input Power: 100 to 277 V. Field configurable for single-phase, bi-phase, and three-phase operation without additional components.
2. Phase Loss Detection Circuitry: 0.5 second delay to prevent nuisance tripping.
3. Integrated Circuit Breaker: Over-current protection and normal power loss simulation.
4. Isolated Outputs: For connection to multiple dimming products simultaneously.
   a. Three Isolated Contacts: Each support connection of four dimming products.
5. Pre-wired by Manufacturer. Contractor to provide input feed and control wiring.
6. Control Wire Connections: Terminated via factory provided connectors.
   a. Support 12 to 22-gauge wiring.
   b. Emergency Lighting Input: Support load shedding.
7. Bypass Detection Kit: Proves a normally-closed input for interface with fire alarm systems. UL and cUL Section 924 Listed for interaction with similarly listed dimming and switching panels.

I. Operating Temperature Range: 32 to 104 degrees F (0 to 40 degrees C).

J. Humidity Non-Condensing: 10 to 90 percent.

3.3 Emergency Lighting Transfer System

A. Automatic transfer of branch circuits from normal to emergency power when normal power fails.

B. Power transfer switches and control circuitry interconnected to provide protection. Transfer designated lighting load branch circuits from dimmers or secondary control outputs to a second power source in event of a power loss to dimmer rack, a normal system failure, or activation of fire alarm.

C. Standards Compliance:

1. ANSI / UL1008 Transfer Switch Equipment. ANSI / NFPA 110 Standard for Emergency and Standby Power Systems. ANSI / NFPA 70 (NEC), including Article 700, 701 and 702 safety standards.

    a. Satisfy Requirements of National Electrical Code (NFPA 70):

        i. Article 700: Emergency Systems.

        ii. Article 701: Legally Required Standby Systems.

        iii. Article 702: Optional Standby Systems.

        iv. Section 518.3(C): Assembly Occupancies.

        v. Section 520.7: Theatres and Similar Locations.

        vi. Section 540.11(C): Motion Picture Projection Rooms.

    b. Comply with US seismic requirements of International Building Code (IBC) for equipment in emergency life-safety chain and be approved for seismic applications. Seismic certification includes installation applications for Roof, Grade, Below Grade, and Intermediate Level installation in the USA with an Ss level of 3.42 and SDS level of 2.28.

    c. Comply with IBC Codes Listed:

        i. IBC 2000: Referencing ASCE 7-98 and ICC AC-156.

        ii. IBC 2003: Referencing ASCE 7-02 and ICC AC-156.

        iii. IBC 2006: Referencing ASCE 7-05 and ICC AC-156.

        iv. IBC 2009: Referencing ASCE 7-05 and ICC AC-156.

2. Self-Contained system for 24 circuits at 20 amps and available for single or three phase power (120/208V, 120/240V or 277/480V).

    a. Available with discrete emergency branch circuit feeds from external circuit breaker panel (by others) or emergency main feed with built-in branch circuit distribution and over current protection.

3. Transfer Switch:

    a. UL 1008 Listed, electrically operated, and mechanically held.

b. Positively Locked: Unaffected by voltage variations or momentary outages so constant contact pressure is maintained and temperature rise at contacts is minimized.

c. Mechanically Interlocked: To ensure one of two positions, Normal or Emergency.

d. Configured as guaranteed break-before-make.

e. Built-In Fuses: 65000 A Short Circuit Current Rating (SCCR) on connected emergency circuits. Class G on each output for compliance with NEC Section 700.27 Coordination.

i. Larger upstream breakers cannot be tripped by downstream branch circuit faults.

f. Switch Contacts: Withstand transfer without welding, with 180 degree phase displacement between Normal and Emergency power sources.

i. Both sources energized and with 80 percent load.

ii. Rated for mixed loads, including electric discharge lamps and tungsten filament lamps.

iii. Rated for 6000 cycles at full tungsten load.

4. Control Circuit:

a. Direct operation of transfer switch.

b. User Configurable Timing Delays for Power Transfer Between:

i. Loss of Normal Power and Transfer to Emergency: Up to 10 sec.

ii. Normal Power Restoration: Transfer from emergency up to 60 seconds.

c. Normally closed dry contact closure fire alarm input.

d. Connections for 5 Remote Stations which manually switch between normal and emergency power.

5. Operation:

a. Transfer to alternate supply when normal supply voltage drops below 80 V when used at 120V, or 185 V for the A phase and 80 V for the B and C phase when used at 277 V.

b. Self-supervising isolated signal input for connection to facility fire alarm. Transfers loads to Emergency power when fire alarm is activated as part of normally-closed loop.

c. Key-Operated Switch: Provided to manually control ELTS2. Automatic functions override this control. Two indicator lights show position of transfer switch.

d. Automatic functions override remote control functions. Any combination of open or shorted wiring to remote stations will not affect automatic functions or disable local switch.

6. Enclosure:

a. Mounts in a NEMA 1 interior or NEMA 4 watertight enclosure finished in textured epoxy paint. Hinged locking door.

b. Power distribution and branch circuit protection for emergency power circuits.

c. Independent of other equipment. In no instance is the ELTS2 to be enclosed in a dimmer rack or an enclosure with other equipment.

d. Approved overlay mounted on front of enclosure, stating, "EMERGENCY LIGHTING TRANSFER SYSTEM."

e. Standards Compliance: UL1008 Listed.

PART 4 – GENERAL NETWORK

4.1 NETWORK

A. GENERAL

1. The controls network shall provide data distribution over TCP/IP Ethernet networks. Data shall be layer 3 routable. Systems using proprietary formats or formats other than 10/100/100Mbit wired Ethernet or non-layer 3 routable networks shall not be accepted.

2. Connections shall be made between consoles, face panels, architectural processors, dimmers, gateways, and computers over standard Ethernet distribution systems using 100BaseT, 100BaseFL, or greater wiring. All installations shall conform to established Ethernet wiring practice, and installation shall be performed by contractors qualified to do this type of work. All wiring shall be tested at Category 5e or higher for full bandwidth operation to the appropriate IEEE standard.

3. The Lighting Control system must be supplied by a single manufacturer and must have seamless integration over Ethernet between the Entertainment and Architectural lighting control.

B. CAPACITIES

1. The network shall support DMX routing, patching, and prioritization for up to 63,399 universes (32,767,488 DMX addresses). Each address may be input or output from any port on any DMX gateway in the system. DMX input, routing and output shall be specifically supported on the system from multiple sources and locations up to the maximum number of gateways supported by the Ethernet topology.

2. The network shall support multiple network hosts including consoles, gateways, dimming racks, computers, file servers, printers, and architectural control processors with discrete command lines and control. The lighting network shall support multiple venues within a system and discrete systems on the same network.

C. System Configuration and Monitoring

1. Network device configuration shall be via Net3 Gateway Configuration Editor (GCE) software and/or ANSI E1.17 Architecture for Control Networks (ACN).

2. Patch addresses shall support viewing and manipulation via ANSI E1.17 ACN.

3. The system shall permit complete user flexibility allowing the system operator to patch each DMX input address to any ANSI E1.31 streaming ACN address, and DMX output to span streaming ACN universes.

4. The lighting system shall support assignment of DMX offsets, truncation of DMX universes, and provide choice of DMX port prioritization.

5. The lighting system shall support the DD start code extension to ANSI E1.31 which provides priority per address such that multiple control sources can share universes with discrete control per address.

6. Lighting systems that do not support the above mentioned address patching capabilities shall not be suitable.

7. The system shall allow assignable labels for all network devices to allow easy identification by system users.

8. Each network device shall have a discrete and unique IP address provided automatically by the software. The user may edit this IP address. Systems that do not support automated IP allocation with IP collision avoidance, and systems that do not allow complete reconfiguration of the above mentioned features over ANSI E1.17 ACN shall not be acceptable.

9. All configuration data for each network device shall be held at the device and system operation shall not require continuous on-line operation of the network configuration software.

10. Lighting console operators shall be able to backup the network configurations in the lighting control console. In the event of a network device failure, the operator shall be able to apply the configuration of the failed device to a replacement device of the same type without manually reentering settings. Systems that do not support configuration backup as described above shall not be accepted.

11. Architectural and Entertainment systems connected to the same network shall be capable of arbitrating control over E1.31 Streaming ACN (sACN) level data. The system shall be capable of alternating control of individual address data between architectural and entertainment systems without intervention by the user. The user shall dictate the conditions under which system shall automatically take control. The network shall allow user override of the selected defaults. Systems which require direct user intervention to allocate control of dimmers between architectural and entertainment lighting systems shall not be accepted.

12. The network shall allow multiple DMX input sources to be prioritized on the same universe as network native sources using E1.31 Streaming ACN prioritization. Multiple DMX inputs may be assigned to the same streaming ACN address (this provides multi-source control for a particular address). Likewise, the system shall support E1.31 prioritization of multiple simultaneous network sources. Systems that cannot prioritize multiple DMX inputs and multiple native network sources on a network shall not be deemed suitable.

13. The lighting network shall allow each DMX input address to be assigned a priority on the network allowing each DMX control level coming into the system to participate in full arbitration. Addresses with the highest priority shall have control, with lower priority addresses being ignored. Addresses assigned the same numeric priority, between 1 and 200, shall respond in highest level takes precedence (HTP) manor. The network shall require a valid DMX signal present at the input to initiate prioritization. Systems that do not allow for prioritized HTP for DMX inputs to the network shall not be allowed.

D. Operational Features

1. Each DMX gateway shall control up to 512 DMX addresses per port, within the confines of up to 63,999 DMX universes (32,747,488 address). The specific DMX data input or output by the gateway shall be configurable by the user.

2. Duplicate outputs of DMX data (DMX splitter) and discrete outputs shall be fully supported.
3. Merging of multiple DMX input sources on a single gateway with DMX output on the same gateway shall be supported without connection to the network. The gateway shall support assignment of priority to each input source independently
4. File transmission, synchronization and access to software shall be supported.

4.2 NETWORK GATEWAY

A. Four-Port Gateway:

1. Standards Compliance: cETLus Listed, CE compliant, EAC certified, RoHS compliant, WEEE.
2. Functional:
   a. Supports Net3/ACN (ANSI E1.31 and E1.17), RDM (ANSI E1.20), and Supports USITT DMX512-A (ANSI E1.11).
   b. Compliance: USITT DMX512 and ANSI E1.11 DMX512-A.
   c. Flexible Output Patch: Allows a 512-address universe to begin at any output address.
   d. Advanced Input Patch.
   e. Support for per-address- or per-universe-level priority.
   f. Delay Time: From input to output not greater than one packet time.
   g. Selectable DMX refresh rate: Maximum of 40 Hz.
   h. Supports 255 total RDM devices.
3. Mechanical:
   a. Intuitive four-button interface.
   b. Onboard display for identification, status, and configuration.
   c. Fabricated from 16-gauge cold-rolled steel.
   d. Finish: Black, Fine-textured, powder-coat.
   e. C-clamp and U-bolt hardware available.
   f. Half 19 inch equipment rack width allows eight DMX ports in 1U height.
   g. Network, power, and data activity LED indicators.
      i. Blue power indicator, green network activity indicator.
      ii. Bi-color DMX activity indicator.
   h. Repositionable RJ45 connector for connection to lighting network.
   i. Reset button for hard reset or forced reboot.
4. Environmental:
   a. Ambient operating temperature: 32 to 104 degrees F.
   b. Operating Humidity: 5 - 95 percent non-condensing.
   c. Storage temperature: Minus 40 to 158 degrees F.
5. Electrical:

a. Compliant with IEEE 802.3i for 10BASE-T, 802.3u for 100BASE-TX and 802.3af for Power over Ethernet.

b. Power Input: 12-24 VDC for use with non-PoE systems.

c. Maximum seven watt current draw.

d. Pluggable clamp style terminals for solid and stranded cable provided for terminal version.

6. Configuration:

a. Local configuration options.

b. Remote configuration by Concert.

i. Supports 512 DMX addresses per port.

ii. Supports 63,999 Streaming ACN universes.

c. DMX data input or output configurable by user.

d. Multiple sources may be combined to the network with each source or address allowed an independent priority

e. Individual port start address and offset

f. User-configurable labeling

B. Opto-Splitter Series:

1. Standards Compliance: cETLus Listed, CE compliant, EAC certified, RoHS compliant, WEEE.

2. Functional:

a. No configuration required.

b. Supports DMX512, DMX512 (1990), DMX512-A, ANSI E1.20 Remote Device Management (RDM).

c. Supports 256 total RDM devices

3. Mechanical:

a. Power and data activity LED indicators.

i. Blue power indicator.

ii. Green DMX activity indicator.

4. Environmental:

a. Ambient operating temperature: 32 to 104 degrees F.

b. Operating Humidity: 5 - 95 percent non-condensing.

c. Storage temperature: Minus 40 to 158 degrees F.

5. Electrical:

a. Supports DMX input and DMX thru.

b. Provides optically isolated DMX/RDM outputs.

c. DIN Box form factors include a suitable power supply.

4.3 DMX GATEWAY – TWO PORT

A. General

1. The lighting control gateway shall be a microprocessor-based unit specifically designed to provide DMX-512 control of lighting. The gateway shall permit DMX-512 data to be encoded, routed over an Ethernet network and decoded back to DMX-512. The unit shall be a Net3 DMX 1-port Gateway as provided by ETC, Inc.
2. Gateways shall communicate over Ethernet directly with at least ETC, Inc.'s entertainment and architectural lighting control products and other Ethernet interfaces.
3. Connections shall be made between gateways, consoles, architectural systems, and PCs over standard Ethernet distribution systems using 10/100BaseT.
4. The gateway shall support multiple protocols including:
   a. ANSI E1.31 Streaming ACN (sACN)
   b. ANSI E1.11 USITT DMX512-A
   c. ETCNet2 protocol suite
   d. ETCNet protocol suite
5. The gateway shall be tested to UL standards and labeled ETL Listed.
6. The gateway shall be RoHS Compliant (lead-free).
7. The gateway shall be CE compliant.
8. The gateway shall be configurable using Network Configuration Editor (NCE) software.
9. Each gateway shall have power and network activity

B. DMX Ports

1. DMX Ports shall comply with the requirements of ANSI E1.11 USITT DMX512-A standards.
2. Each DMX port shall be software-configurable for either input or output functionality.
3. Hardware configuration override setting shall be provided on the gateway.
4. DMX input shall be optically-isolated from the gateway electronics.
5. DMX output shall be earth-ground referenced.
6. DMX Port shall be capable of withstanding fault voltages of up to 250vAC without damage.
7. Each port shall incorporate one DMX512-A Connection
   a. Each DMX port location shall support a single 5-pin male XLR, 5-pin female XLR.
8. Network gateways that do not indicate input/ output port configuration or presence of valid data shall not be accepted

C. Processor

1. Maximum delay time from input to output shall not be greater than one packet time (approximately 22 mSec.).

2. A minimum DMX update rate of 40Hz shall be sustained under all conditions unless specifically configured for a slower rate for the sake of compatibility with 3rd party DMX devices.

D. Mechanical

1. The gateway faceplate shall be constructed of durable cast aluminum and mount in a standard 1 gang backbox. Faceplates manufactured of plastic shall not be acceptable.
2. Gateways shall be provided in matte black powder coat finish.
3. The gateway shall be available in two versions
   a. Wall mount gateway
      i. The wall mount gateway shall support flush or surface mount applications using a standard RACO 690 backbox or equivalent.
      ii. Dimensions shall not be more than 2.75” (70mm) wide x 4.5” (115mm) High
      iii. Wall mount gateways shall not weigh more than.35 lbs (.16kgs)
   b. Touring gateway
      i. The touring gateway shall include a complete enclosure with Ethercon and power connectors for wiring terminations.
      ii. Dimensions shall not be more than 4.5” wide (115mm) x 3.5” (89mm) deep x 6.34” (161mm) high (not including mounting hardware).
      iii. Touring gateways shall not weigh more than 2.5 lbs (1.1 kg).

E. Power

1. Power for the gateway shall be provided either over the Category 5 (or better) cable, utilizing IEEE 802.3af compliant Power over Ethernet distribution equipment. Power consumption shall not be greater than 5 watts.
2. The gateway electronics shall be electrically isolated from the power supplied over the Catagory5 (or better) cable.

F. Configuration

1. Each gateway on the network shall be individually configurable using Network Configuration Editor (NCE), running on a network connected PC. The PC shall only be required for configuration, and shall not be required for normal operation of the system.
2. Each DMX gateway shall control up to 512 DMX addresses. The specific DMX data input or output by the gateway shall be freely configurable by the user. Duplicate outputs of DMX lines (DMX splitter) and discrete outputs shall be fully supported.
3. Multiple sACN sources may be combined with a priority may be assigned to each source sending data to the gateway.

G. Network

1. Communications physical layer shall comply with IEEE 802.3i for 10BASE-T, 802.3u for 100BASE-TX and 802.3af for Power over Ethernet specifications.
2. All network cabling shall be Category 5 (or better), conforming to TIA-568A/B, and shall be installed by a qualified network installer.
3. Data transport shall utilize the TCP/IP suite of protocols to transfer the DMX data.
4. ANSI E1.31 streaming ACN (sACN) shall be supported. Gateways that do not support ANSI E1.31 shall not be acceptable.
5. Switches shall comply with power-over-Ethernet IEEE802.3af, unless a separate in-line power supply is provided.
6. Each DMX gateway shall control up to 512 DMX addresses, per DMX port within the confines of up to 64,399 universes (32,767,488 addresses) when using Streaming ACN (sACN) and 64 DMX universes (32,767 addresses) when using EDMX.
    a. Multiple sources shall be supported by prioritized Highest Takes Precedence (HTP with priority). Each source shall support assignment of priority to allow override of default HTP behavior.
    b. Each DMX port shall support its own universe and start address.
7. Gateways shall support have built in priority on a per-universe or channel-by-channel basis. Gateways that do not support prioritized merging of multiple network sources at independent priorities shall not be accepted.

H. Environmental

1. The ambient operating temperature shall be 0° to 40°C (32° to 104°F).
2. The storage temperature shall be -40° to 70°C (-40° to 158°F).
3. The operating humidity shall be 5% - 95% non-condensing.

I. Accessories

1. Hanging bracket kit shall allow gateway to be mounted using C-Clamp to U-bolt Hardware.
2. ETC Network Configuration Editor (NCE) software

J. System Requirements

1. Provide the quantity and type of gateways required, as scheduled. Gateways and software shall be as manufactured by Electronic Theatre Controls Inc. of Middleton, WI.
2. Provide Ethernet switches and power supplies as scheduled and as shown on drawings.
3. Provide a current generation PC with Windows XP operating system equipped with a 10/100 Ethernet card.
4. Systems that do not provide the above capabilities shall not be acceptable

K. Lighting control data distribution Infrastructure

1. The reconfigurable lighting control data distribution infrastructure installed in the system’s central equipment rack shall consist of a PoE Ethernet switch, RJ45 Patch.

2. The infrastructure is intended to allow any UTP cable path (debarking from the equipment rack to locations distributed throughout the facility) to be utilized for transport of various data and signal types.
    a. Infrastructure shall allow end user to patch ports on the network switch to any UTP cable for PoE Ethernet distribution.
    b. Infrastructure shall allow end user to connect remote Ethernet to DMX Conversion Gateways into RJ45 ports distributed throughout the building.
    c. Infrastructure shall allow end user to transport, over debarking UTP cables, other signal types (RS232, Video) with the use of an appropriate balyun pair

L. UTP cable plant & patch bay

1. The UTP cable infrastructure shall comply with IEEE 802.3i for 10BASE-T, 802.3u for 100BASE-TX and 802.3af for Power over Ethernet specifications.
2. On the RJ45 patch bay all outputs and inputs from lighting system data sources and UTP cables to destinations shall be terminated, labeled, and color coded:
    a. RJ45 ports on patch bay that debark to points distributed throughout the facility shall be terminated in Black connectors.
    b. RJ45 ports on patch bay that connect to DMX inputs on Conversion Gateways shall be terminated in Orange connectors.
    c. RJ45 ports on patch bay that connect to Dimming Racks shall be terminated in Blue connectors.
    d. RJ45 port on patch bay that connect to Unison Architectural processor shall be terminated in Yellow connector.

M. Refer to drawings for equipment requirements.

PART 5 – THEATRICAL POWER CONTROL

5.1 Relay Panel Mains Feed

A. General

1. Control-oriented power center. Supports up to 24 relays or dimmers with integral branch breakers. Integrated DMX and Ethernet connectivity. Optional 0-10 V, DALI, and contact input control cards. UL 924 listed for emergency lighting control.

B. Construction: Steel, 16 ga.

1. Finish: Black, fine-textured, scratch-resistant powder coat.
2. Removable Outer Panel: Includes integral locking door to limit access to electronics, breakers, and local relay overrides.
3. Full Front Access: No side clearance required.
4. Removable Covers: For access to Class 1 and 2 wiring.

C. Thermal:

1. Operating Temperature: 32 to 104 degrees F (0 to 40 degrees C).

2. Humidity: 10 to 90 percent, non-condensing.

D. Electrical:

1. Main Feed Power Input:
   a. Power: Three-Phase 4-Wire Plus Ground: 120/208 V.
2. Separate Wiring Chambers: For Class 1 and Class 2 terminations.
3. Max Input Current: 200 Amps.
4. Main Circuit Breaker: 100 or 200 Amps.
5. Branch Breaker Panel: Supports 3-phase or 1-phase sub-feed of a second panel up to 100 Amps.
6. Short-Circuit Rating: 10,000 to 42,000 Amps symmetrical.
7. Branch Circuit Breakers: 1, 2, or 3 pole. 10, 15, and 20 A. Rating: 80 percent.
8. Inrush-pulse tolerance: 8 to 10.5 times rated current for half-cycle at 60 Hz.

E. Relay Ratings:

1. Ballast (HID): 20 A.
2. Electronic Ballast: 16 A.
3. Tungsten: 20 A.
4. Motor Load: 20 A.
5. Isolation: 4000 V RMS.
6. State: Latching; mechanically held.
7. Life: 100,000 cycles at full resistive load.
8. Life: 30,000 cycles motor, inductive, or tungsten.
9. Current-Reporting Accuracy: Plus or minus 5 percent of connected load.

F. Control:

1. User interface:
   a. Graphical display with LED backlight.
   b. Button Interface With: 0 to 9 number buttons.
   c. Navigation Buttons: Up, down, back and enter.
   d. "Light bulb" test button for local preset activation, sequence and set level overrides.
   e. USB interface: For upload of setup and software updates.
2. Control Wiring Terminations:
   a. Control Terminals: Accept 12 AWG wire.
   b. Control Wiring Exiting Panel: Class 2.
   c. Control Terminations: Utilize removable connectors.
3. Relay Modes: Normal (priority/HTP), latch-lock or last-action.
4. Configurable DMX on/off threshold.

5. Status feedback for breaker state, relay state, current drawer circuit, phase voltage and energy usage per circuit.
6. Presets and sequences:
    a. Sixteen spaces with 64 presets per space configurable via local UI.
    b. One 16 step sequence per space.
7. UL924 Listed emergency control bypass.

G. Configurable Data-Loss Behavior: Play preset; Hold last look; Wait and fade.

H. Standards Compliance: Listed: cULus, UL508, UL67, and UL924. ANSI E1.11 DMX512-A and ANSI E1.31 streaming ACN.

I. Quantities and configurations of Relay Panel Mains Feed enclosures, power control cards, and accessories to be supplied as shown on project drawings.

PART 6 CIRCUIT AND DATA DISTRIBUTION

6.1 Connector Strip

A. Mechanical:

1. Construction:
    a. Raceway: 18 ga galvanized steel.
    b. End caps and junction brackets: 14 ga galvanized steel.
    c. Covers and faceplates: 16 ga galvanized steel.
2. Dimensions: (HxD): 6.25 x 3.3 in. (159 x 84 mm); Lengths as specified.
3. Weight: 6 lb per ft (8.9 kg per m).
4. Finish: Fine-textured black powder coat paint.
5. Circuit Labels:
    a. 2 in. (50 mm); vinyl; white lettering on black; front only.
6. Ship wired and folded in 6 ft (1.8 m) lengths with splicing hardware.
7. Hanger Brackets: 1.50 x 0.188 inch ASTM A36 steel with ASTM A307 grade 5 hardware. Finish: Fine-textured black powder coat paint.
    a. Wire rope suspension mount, double pipe batten.
    b. Catwalk railing mount.

B. Electrical:

1. Internal Wiring: Sized to circuit ampacity. Rated at 125 degrees C.
2. Power Output Pigtails and Receptacles:
    a. Pigtails and Receptacles: Mounted on 3 in (76 mm) plates.
    b. Pigtails: Three-wire type "S" jacketed cable sized for the maximum circuit ampacity. Available in 18 in, 24 in., 36 in., or custom length.
        i. Available in any combination of the following on a single strip:

c. 20 Amp grounded stage pin (GPC/2P&G).

3. Available Data Outlets: Supports the following options per connector strip:

a. Max total of 6 data inputs, Active Pass-thru chains count as two inputs:

b. Chain of 5-pin XLR DMX/RDM Active Pass-thru connectors.

i. Max of 24 connectors and 32 RDM devices per chain.

c. Passive 5-pin XLR DMX outputs (1 connector per data input; upstream optosplitter or DMX gateway required for multiple inputs).

d. RJ45 Ethernet (sACN) ports (1 connector per data input).

e. Integrated ETC Response 1-port Gateways (1 per data input).

f. Integrated ETC Response 2-port Gateways (1 per data input).

C. Standards Compliance: cULus Listed to UL 1573 and CSA C22.2 No. 166.

D. Connector strips to be supplied as shown on project drawings.

6.2 Pigtail and outlet boxes – Gridiron junction boxes – Electronic control plug-in boxes (ECPB).

A. Mechanical:

1. Construction: Boxes constructed from 18 ga and 14 ga steel. NEMA and ECPB faceplates constructed of aluminum.
2. Finish: Fine-textured black powder coat.
3. Include mounting brackets and hardware.

B. Electrical:

1. Wire Entry: Conduit knockouts to feed-through terminals individually labeled with corresponding circuit numbers.
2. Wire Exit: Connectorized receptacles, conduit knockouts, or cable glands.
3. Low voltage barriers or junction boxes as required.
4. Circuit Labels: 2 in. (50 mm); vinyl; white lettering on black; front only.
5. Standards Compliance: cULus Listed to UL 1573 and CSA C22.2 No. 166.
6. Power and data distribution equipment to be supplied as shown on project drawings.

C. Refer to drawings for equipment requirements.

PART 7 –THEATRICAL LIGHTING CONSOLE

7.1 LIGHTING CONSOLE

A. General:

1. Model Ion Xe 20 2K: Ion Xe 20 console, 2,048 outputs (base)
2. Power consumption: Approximately 2 A at 120 V or 230/240 V.

3. Ambient Room Temperature: 32 to 95 degrees F (0 to 35 degrees C).
4. Ambient Humidity: Up to 90 percent non-condensing.
5. Regulatory Compliance: CE compliant, cETLus listed, UKCA marked, FCC compliant, RoHS compliant, and WEEE.
6. Hardware and Interfaces:
    a. Supports two external display port monitors (1920 x 1080 min, 3840 x 2160 max). Optional single-touch or multi-touch screen control and DDC/CI support.
    b. Twenty 45 mm standard faders, 100 10-fader pages configurable as channels, submasters, palettes/presets, timing, and effect rate/speed playback control.
    c. Two internal monochromatic LCD displays for fader content.
    d. Main Playback with two 100 mm standard faders.
    e. Four encoders for non-intensity parameter control.
    f. Dedicated high-resolution intensity level wheel.
    g. Backlit Eos keypad.
    h. Included USB keyboard.
    i. Solid-state hard drive.
    j. IEC Power Input: 100 to 240 VAC at 50/60 Hz, fused mains power switch, locking regionalized power cable included.
    k. Two individually configurable Gigabit Ethernet ports, RJ45 connectors.
    l. One 802.11ac Wi-Fi Ethernet adapter. To be enabled with future software.
    m. Bluetooth 5.1 for connecting input accessories. To be enabled with future software.
    n. sACN and Art-Net network output protocols.
    o. Four DMX-512 / RDM 5-pin XLR ports.
    p. Contact closure triggers via D-Sub connector.
    q. USB 3.1 ports, for flash drives, pointing devices, keyboards.
    r. USB-A Ports: 5. USB-C Ports: 2
    s. One Littlite XLR port.
    t. One Kensington lock port.
    u. Multiple MIDI and/or SMPTE timecode inputs, MIDI In and Out, Analog/Serial Inputs, OSC transmit/receive, UDP transmit/receive through network interface or Response Gateways.

B. Refer to drawings for equipment requirements.

PART 8 –THEATRICAL LIGHTING INSTRUMENTS

8.1 COLOR MIXING LED PROFILE FIXTURE

A. General

1. The fixture shall be a color-mixing high-intensity LED illuminator with DMX control of intensity and color.
2. The fixture shall be UL 1573 listed for stage and studio use
3. The fixture shall comply with the USITT DMX-512A standard

B. Physical

1. The unit shall be constructed of rugged, die cast aluminum, free of burrs and pits.
2. The following shall be provided:
    a. Lens secured with silicone shock mounts
    b. Shutter assembly shall allow for +/-25° rotation
    c. 20 gauge stainless steel shutters
    d. Interchangeable lens tubes for different field angles with Teflon guides for smooth tube movement
    e. Sturdy integral die cast gel frame holders with two accessory slots, and a top-mounted, quick release gel frame retainer
    f. Rugged steel yoke with two mounting positions allowing 300°+ rotation of the fixture within the yoke
    g. Positive locking, hand operated yoke clutch
    h. Slot with sliding cover for motorized pattern devices or optional iris
3. The housing shall have a rugged black powder coat finish
4. Power supply, cooling and electronics shall be integral to each unit.
5. The unit shall ship with:
    a. Theatrical-style hanging yoke as standard
    b. 5’ cable with Neutrik PowerCon™ to choice of connector as standard
    c. Gate diffuser
    d. A-size pattern holder
6. Available options shall include but not be limited to:
    a. Bare-end, Stage-Pin or Twist-lock type-equipped power leads
    b. PowerCon to PowerCon cables for fixture power linking
    c. Smooth Wash Diffuser for overlapping beams of light from multiple fixtures

C. Optical

1. The light beam should have a 2-to-1 center-to-edge drop-off ratio

2. The unit shall provide, but not be limited to:
    a. Low gate and beam temperature
    b. Sharp imaging through a three-plane shutter design
3. The unit shall provide, but not be limited to:
    a. 5, 10, 14, 19, 26, 36, 50, 70 and 90 degree field angles
    b. High-quality pattern imaging
    c. Sharp shutter cuts without halation
    d. Shutter warping and burnout in normal use shall be unacceptable
    e. Adjustable hard and soft beam edges
4. 19, 26, 36, and 50 degree units shall have optional lens tubes available for precision, high-contrast imaging.

D. Environmental and Agency Compliance

1. The fixture shall be ETL and cETL LISTED and/or CE rated, and shall be so labeled when delivered to the job site.
2. The fixture shall be ETL LISTED to the UL1573 standard for stage and studio use
3. The fixture shall be rated for IP-20 dry location use.

E. Thermal

1. Fixture shall be equipped with a cooling fan.
2. The fixture shall utilize advanced thermal management systems to maintain LED life to an average of 70% intensity after 54,000 hours of use
    a. Thermal management shall include multiple temperature sensors within the housing to include:
        i. LED array circuit board temperatures
        ii. Fixture ambient internal temperature
3. The fixture shall operate in an ambient temperature range of 0°C (32°F) minimum, to 40° C (104°F) maximum ambient temperature. Lamp

F. Electrical

1. The fixture shall be equipped with a 100V to 240V 50/60Hz internal power supply
2. The fixture shall support power in and thru operation
    a. Power in shall be via Neutrik® PowerCon™ input connector
    b. Power thru shall be via Neutrik ® PowerCon ™ output connector
    c. Fixture power wiring and accessory power cables shall be rated to support linking of multiple fixtures up to the capacity of a 15A breaker
3. The fixture requires power from a non-dim source
4. Fixtures shall have droop compensation to prevent thermal shift of color or intensity
5. Power supply outputs shall have self-resetting current-limiting protection
6. Power supply shall have power factor correction

G. LED Emitters

1. The fixture shall contain a minimum of four different LED colors to provide color characteristics as described in the Color Section below.
2. All LEDs used in the fixture shall be high brightness and proven quality from established and reputable LED manufacturers.
3. Manufacturer of LED emitters shall utilize an advanced production LED binning process to maintain color consistency.
4. LED emitters should be rated for nominal 20,000-hour LED life to 70% intensity
5. All LED fixtures (100% of each lot) shall undergo a minimum three-hour burn-in test during manufacturing.
6. LED system shall comply with all relevant patents

H. Calibration

1. Fixture shall be calibrated at factory for achieve consistent color and intensity output between fixtures built at different times and/or from different LED lots or bins
   a. Calibration data shall be stored on the control card as a permanent part of on-board operating system
   b. All arrays, including replacement arrays shall be calibrated to the same standard to insure consistency
   c. Fixtures not offering LED calibration shall not be acceptable

I. Color

1. The fixture shall utilize an minimum of 60 LED emitters
   a. These emitters shall be made up of Red, Green, Blue and Lime for ColorSource
   b. These emitters shall be made up of Red, Green, Indigo and Lime for ColorSource Deep Blue

J. Dimming

1. The LED system shall use 15-bit nonlinear scaling techniques for high-resolution dimming.
2. The fixture shall utilize an Incandescent dimming curve
3. Dimming curve shall be optimized for smooth dimming over longer timed fades.
4. The LED system shall be digitally driven using high-speed pulse width modulation (PWM)
5. LED control shall be compatible with broadcast equipment in the following ways:
   a. PWM control of LED levels shall be imperceptible to video cameras and related equipment
   b. PWM shall be capable of being set via RDM to 25,000hz

K. Control and User interface

1. The fixture shall be USITT DMX 512A-compatible via In and Thru 5-pin XLR connectors or RJ45 connectors

2. The fixture shall be compatible with the ANSI RDM E1.20 standard
    a. All fixture functions shall accessible via RDM protocol for modification from suitably equipped control console
    b. Temperature sensors within the luminaire shall be viewable in real time via RDM
    c. Fixtures not offering RDM compatibility, feature set access or temperature monitoring via RDM shall not be compatible
3. The fixture shall be equipped with a 7-segment display
4. The fixture shall be equipped with a three-button user-interface
5. The fixture shall be controlled via RGB data input
    a. 5-channel footprint (IRGBS)
6. A variable-rate strobe channel shall be provided
7. The fixture shall offer stand-alone functionality eliminating the need for a console
    a. Fixture shall ship with 12 preset colors accessible as a stand-alone feature
    b. Fixture shall ship with 5 sequences accessible as a stand-alone feature
    c. Each color and sequence can be modified by the end user via RDM
    d. Fixtures can be linked together with standard DMX cables and controlled from designated master fixture
        i. Up to 32 fixtures may be linked
    e. Fixtures in a stand-alone state shall restore to the settings present prior to power cycling, eliminating the need for reprogramming
    f. Fixtures without stand-alone operation features described above shall not be acceptable.

8.2 COLOR MIXING LED THEATRICAL WASH FIXTURE

A. General

1. The fixture shall be a color-mixing high-intensity LED illuminator with DMX control of intensity and color.
2. The fixture shall be UL 1573 listed for stage and studio use
3. The fixture shall comply with the USITT DMX-512A standard

B. Physical

1. The fixture shall be contained in a rugged all-metal die-cast housing, free of burrs and pits.
2. The housing shall have a rugged black powdercoat finish
3. Power supply, cooling and electronics shall be integral to each unit.
4. Fixture housing shall provide two easy-access slots for secondary lenses and other accessories
    a. Slots shall be equipped with locking retaining clip
5. The unit shall ship with:
    a. Theatrical-style hanging yoke as standard

b. 5’ power lead with Edison connector as standard

6. Available options shall include but not be limited to:
   a. Yoke with floor stand conversion feature
   b. Bare-end, Stage-Pin or Twist-lock type-equipped power leads
   c. PowerCon to PowerCon cables for fixture power linking
   d. Multiple secondary lens options to include multiple angles in the following patterns:
      i. Linear
      ii. Round
      iii. Oblong
7. Light output shall be via a round aperture
   a. Accessories available as options shall include but not be limited to:
      i. Gel/diffusion frames
      ii. Top hats
      iii. Barndoors
      iv. Egg crate louvers
      v. Concentric ring louvers
      vi. Multiple secondary lensing options

C. ENVIRONMENTAL AND AGENCY COMPLIANCE

1. The fixture shall be UL and cUL LISTED and/or CE rated, and shall be so labeled when delivered to the job site.
2. The fixture shall be UL LISTED to the UL1573 standard for stage and studio use
3. The fixture shall be rated for IP-20 dry location use.

D. THERMAL

1. The fixture shall be cooled with a variable speed fan.
2. The fixture shall utilize advanced thermal management systems to maintain LED life to an average of 70% intensity after 20,000 hours of use
   a. Thermal management shall include multiple temperature sensors within the housing to include:
      i. The LED array
      ii. The control board
3. The fixture shall operate in an ambient temperature range of 0°C (32°F) minimum, to 40° C (104°F) maximum ambient temperature.

E. ELECTRICAL

1. The fixture shall be equipped with 100V to 240V 50/60 Hz internal power supply
2. The fixture shall support power in and thru operation
   a. Power in shall be via Neutrik® PowerCon™ input connector
   b. Power thru shall be via Neutrik ® PowerCon ™ output connector

c. Fixture power wiring and accessory power cables shall be rated to support linking of multiple fixtures up to the capacity of a 15A breaker

3. The fixture requires power from non-dim source
4. Power supply outputs shall have self-resetting current limiting protection
5. Power supply shall have power factor correction

F. LED Emitters

1. The fixture shall contain a minimum of 4 different LED colors to provide color characteristics as described in Section H below.
2. All LEDs used in the fixture shall be high brightness and proven quality from established and reputable LED manufacturers.
3. Manufacturer of LED emitters shall utilize an advanced production LED binning process to maintain color consistency.
4. LED emitters should be rated for nominal 20,000 hour LED life to 70% intensity
5. All LED fixtures (100% of each lot) shall undergo a minimum three-hour burn-in test during manufacturing.
6. LED system shall comply with all relevant patents

G. CALIBRATION

1. Fixture shall be calibrated at factory for achieve consistent color between fixtures built at different times and/or from different LED lots or bins
   a. Calibration data shall be stored in the fixture as a permanent part of on-board operating system
   b. All arrays, including replacement arrays shall be calibrated to the same standard to insure consistency
   c. Fixtures not offering LED calibration shall not be acceptable

H. COLOR

1. The fixture shall utilize an minimum of 40 LED emitters
   a. These emitters shall be made up of Red, Green, Blue and Lime for ColorSource
   b. These emitters shall be made up of Red, Green, Indigo and Lime for ColorSource Deep Blue

I. DIMMING

1. The LED system shall use 15-bit nonlinear scaling techniques for high-resolution dimming.
2. The dimming curve shall be optimized for smooth dimming over longer timed fades.
3. The LED system shall be digitally driven using high-speed pulse width modulation (PWM)
4. LED control shall be compatible with broadcast equipment in the following ways:
   a. PWM control of LED levels shall be imperceptible to video cameras and related equipment

b. PWM rates shall be adjustable by the user via RDM to avoid any visible interference to video cameras and related equipment

J. CONTROL AND USER INTERFACE

1. The fixture shall be USITT DMX 512A-compatible via In and Thru 5-pin XLR connectors
2. The fixture shall be compatible with the ANSI RDM E1.20 standard
   a. All fixture functions shall accessible via RDM protocol for modification from suitably equipped control console
   b. Temperature sensors within the luminaire shall be viewable in real time via RDM
   c. Fixtures not offering RDM compatibility, feature set access or temperature monitoring via RDM shall not be compatible
3. The fixture shall be equipped with a 7-segment display for easy-to-read status and control
4. The fixture shall be equipped with a three-button user-interface
5. The fixture shall offer RGB control
6. The fixture shall operate in Regulated mode for droop compensation
7. The fixture shall offer stand-alone functionality eliminating the need for a console
   a. Fixture shall ship with 12 preset colors accessible as a stand-alone feature
   b. Fixture shall ship with 5 Sequences accessible as a stand-alone feature
   c. Each color and sequence can be modified by the end user
   d. Fixtures can be linked together with standard DMX cables and controlled from designated master fixture
      i. Up to 32 fixtures may be linked
   e. Fixtures in a stand-alone state shall restore to the settings present prior to power cycling, eliminating the need for reprogramming
   f. Fixtures without stand-alone operation features described in a, b, c, d, and e shall not be acceptable.

8.3 COLOR MIXING LED THEATRICAL CYC FIXTURE

A. General

1. The fixture shall be a broad-spectrum color-mixing LED illuminator with DMX control of intensity as well as color changing.
2. All LED fixtures shall be provided by a single manufacturer to ensure compatibility.
3. The fixture shall comply with USITT DMX-512 A.

B. Physical

1. The unit shall be black in color and contained in a rugged all-metal extruded and formed-metal housing, free of burrs and pits.
2. Power supply, cooling and electronics shall be integral to each unit.

3. The unit shall provide, but not be limited to:
    a. 1/2” Mounting bolts on each end
    b. 5’ power lead with Edison connector
    c. Easy-access slots for secondary lenses for varied beam spreads
    d. Optional yoke (11” and 21” only), trunnion, and hanging bracket mounting kits.
    e. Bare-end, Stage-Pin or Twist-Loc power leads shall be available
4. Four sizes shall be available:
    a. 11in (280mm) long by 7.1in (180mm) high by 7.1in (180mm) deep, with a weight of 11.5 lbs (5.2 kg) not including mounting hardware
    b. 21.5in (547mm) long by 7.1in (180mm) high by 7.1in (180mm) deep with a weight of 20 lbs (9.1 kg) not including mounting hardware
    c. 42.5in (1080mm) long by 7.1in (180mm) high by 7.1in (180mm) deep with a weight of 35 lbs (15.9 kg) not including mounting hardware
    d. 63.5in (1613mm) long by 7.1in (180mm) high by 7.1in (180mm) deep with a weight of 53 lbs (24.1 kg) not including mounting hardware

C. Environmental and Agency Compliance

1. The fixture shall operate in an ambient temperature range of 0°C minimum, to 40° C (104°F) maximum ambient temperature. The fixture shall be rated for IP-20 dry location use.
2. The fixture shall utilize advanced thermal management systems for long LED life
3. The fixture shall provide on-board fan speed control
4. LED fixture housing shall be designed to transfer heat from the LED board to the outside environment.
5. The fixture shall be ETL and cETL LISTED, and shall be so labeled when delivered to the job site. The fixture shall be ETL LISTED to UL1573.

D. ELECTRICAL

1. The fixture shall be equipped with 100V to 240V 50/60 Hz internal power supply
2. The fixture shall receive power via Neutrik® PowerCon™ input connector
3. The fixture requires power from non-dim source
4. Power/data supply outputs shall have current limiting protection.
5. Power/data supply shall provide miswiring protection.
6. Power/data supply shall have power factor correction.
7. Power/data supply shall be UL listed for Class 1 or Class 2 wiring
8. Power/data supply shall come with a housing that meets a minimum IP20 rating for dry location installation

E. LED Emitters

1. The fixture shall utilize red, red-orange, amber, green, cyan, blue, and indigo emitters for maximum spectral output.
2. All LEDs used in the LED fixture shall be high brightness and proven quality from established and reputable LED manufacturers.

3. Manufacturer of LED systems shall utilize an advanced production LED binning process to maintain color consistency.
4. LED emitters should be rated for nominal 50,000 hour LED life
5. The fixture shall utilize Luxeon® Rebel™ 2.5W LED emitters
6. All LED fixtures (100% of each lot) shall undergo a minimum eight-hour burn-in test during manufacturing.
7. LED system shall comply with all relevant patents.

F. COLOR

1. The fixture shall utilize the exclusive x7 Color System™ 7-color LED array
2. Each 11” cell shall contain 40 LEDs
3. Each 11” cell shall contain seven different colors of LED emitters for maximum spectral output
4. The fixture shall optimized for excellent pastel and saturated colors
5. The LED system shall be capable of at least 15-bit control of each color level in each cell for greater than 1 billion possible color combinations.
6. The fixture shall interact seamlessly with conventional sources
7. The fixture shall render light tints and skin tones similar to tungsten-sourced fixtures.

G. CONTROL

1. Each 11” cell of every fixture shall have the capability to be set to a unique and individual address.
    a. 21” fixture provides 2 independently controlled cells
    b. 42” fixture provides 4 independently controlled cells
    c. 63” fixture provides 6 independently controlled cells
2. The fixture shall be DMX 512 compatible via In and Thru 5-pin XLR connectors
3. The LED system shall be digitally driven using high-speed pulse width modulation (PWM).
4. LED control shall be compatible to broadcast equipment
    a. PWM control of LED levels shall be imperceptible to video cameras and related equipment
5. Each 11” cell of every fixture shall provide 8 channel control (7 color plus intensity)
    a. An intensity channel shall be utilized for each cell to minimize color shift during dimming.
6. The LED system shall use 15-bit nonlinear scaling techniques for high-resolution dimming.
7. Dimming curves shall be optimized for smooth dimming at low intensities and over longer timed fades.

8.4 Provide the following – Auditorium:

A. THEATRICAL CONSOLE

1. 1 – ETC ION XE 2K – with (2) 17” LCD monitors, dust cover and 25’ network cable.

B. THEATER ELIPSOIDAL FIXTURES:

1. 6 - ETC CSSPOTS – ColorSource 19° LED Spotlight(s) complete with “C” clamp, color frame, safety cable, 1M lead with 20A Stage Pin connector and 10’ DMX cable.
2. 24- ETC CSSPOTS – ColorSource 26° LED Spotlight(s) complete with “C” clamp, color frame, safety cable, 1M lead with 20A Stage Pin connector and 10’ DMX cable.
3. 24 - ETC CSSPOTS – ColorSource 36° LED Spotlight(s) complete with “C” clamp, color frame, safety cable, 1M lead with 20A Stage Pin connector and 10’ DMX cable.
4. 6 - ETC CSSPOTS – ColorSource 50° LED Spotlight(s) complete with “C” clamp, color frame, safety cable, 1M lead with 20A Stage Pin connector and 10’ DMX cable.

C. THEATER LED WASH FIXTURES

1. 16 – ETC ColorSource PAR LED fixture, complete with "C" clamp, yoke, safety cables, 1M leads with 20A Stage Pin connectors and 10’ DMX cable, narrow, medium and wide flood round field lenses.

D. THEATER LED CYC

1. 16 – ETC ColorSource Spot Engine Body with CYC Adapter, complete with "C" clamp, yoke, safety cables, 1M leads with 20A Stage Pin connectors and 10’ DMX cable.

E. THEATER FIXTURE ACCESSORIES:

1. 24 - 400PH-B - Pattern holder (B size)
2. 10 - 400PH-G - Glass pattern holder
3. 20 – 5’ DMX cable
4. 10 – 10’ DMX cable
5. 5 – 15’ DMX cable
6. 5 – 20’ DMX cable
7. 6 – 5 pin DMX 120 Ohm terminator

F. THEATER GHOST LIGHT:

1. 1—Altman stage lighting Ghost light, with stand

G. THEATER FOLLOWSPOTS:

1. 2—Lycian Superstar 600w LED followspots or equivalent, complete with, stand, 6 color boomerang

H. THEATER WORKLIGHTS:

1. 12—Osram Kreios Flood Lights – KREIOSFLX90W or equivalent: complete with “C” clamp, safety cable, 1M lead with 20A Twist-Lok connector

8.5 Provide the following – Little Theatre:

A. THEATRICAL CONSOLE

1. 1 – ETC COLORSOURCE 40 CONTROL CONSOLE – with (1) 17” LCD monitors, dust cover and 25’ network cable.

B. THEATER ELIPSOIDAL FIXTURES:

1. 3 - ETC CSSPOTS – ColorSource 26° LED Spotlight(s) complete with “C” clamp, color frame, safety cable, 1M lead with 20A Stage Pin connector and 10’ DMX cable.
2. 16 - ETC CSSPOTS – ColorSource 36° LED Spotlight(s) complete with “C” clamp, color frame, safety cable, 1M lead with 20A Stage Pin connector and 10’ DMX cable.
3. 16 - ETC CSSPOTS – ColorSource 50° LED Spotlight(s) complete with “C” clamp, color frame, safety cable, 1M lead with 20A Stage Pin connector and 10’ DMX cable.

C. THEATER LED WASH FIXTURES

1. 10 – ETC ColorSource PAR LED fixture, complete with "C" clamp, yoke, safety cables, 1M leads with 20A Stage Pin connectors and 10’ DMX cable, narrow, medium and wide flood round field lenses.

D. THEATER FIXTURE ACCESSORIES:

1. 12 - 400PH-B - Pattern holder (B size)
2. 3 - 400PH-G - Glass pattern holder
3. 10 – 5’ DMX cable
4. 5 – 10’ DMX cable
5. 5 – 15’ DMX cable
6. 3 – 5 pin DMX 120 Ohm terminator

PART 9 EXECUTION

9.1 INSTALLATION OF LIGHTING CONTROL EQUIPMENT:

A. Install a complete stage lighting and dimming system and components and ancillary equipment as indicated, in accordance with equipment manufacturer's written instructions, and with recognized industry practices, to ensure that lighting control equipment complies with requirements.

B. Employ the services of a Factory Authorized Theatrical Dealer/Integrator for complete theatrical systems/fixture purchase and project coordination. Dealer/Integrator shall provide the following services:

1. Attendance at prebid walkthrough(s) to answer questions about theatrical systems.
2. Coordination with electrical contractor throughout full term of project.
3. Review all theatrical low voltage terminations made by the electrical contractor.
4. Review the complete theatrical system(s) prior to energization and supervise the energization of system.
5. Complete programming of the system including all button stations and touchscreens and to ensure all architectural fixtures are dimming smoothly and flicker free down to 1%. Two additional site visits shall be provided after the building has been turned over, at six months and one year, to make any changes to the programming that may be required by the Owner.
6. Initial hang and focus of theatrical fixtures per engineer’s/owner’s requirements.
7. The theatrical installer or qualified technician representing the installer shall be present at the first tech rehearsal and first performance within the Auditorium. Owner will coordinate with installer 3 weeks in advance for personal trained on the system to help with the show and be onsite in case there are any problems. The theatrical installer shall provide this within their bid.

C. Comply with requirements of NEC, and applicable portions of NECA's "Standard of Installation" pertaining to general electrical installation practices.

D. Coordinate with other electrical work, including raceways, and electrical boxes and fittings, as necessary to interface installation of lighting control equipment work with other work. Contractor shall be on site as required, to adjust lighting control units for proper light levels as directed by engineer.

E. Provide all required drawings for each system identified; show all hardware configurations, panel required schedules and numbering. All panel wiring diagrams and typical wiring diagrams for each component.

9.2 FIELD QUALITY CONTROL:

A. Upon completion of installation and after circuitry has been energized, demonstrate capability and compliance of system with requirements.

B. Where possible, correct malfunctioning units at site, then retest to demonstrate compliance; otherwise, remove and replace with new units, and proceed with retesting.

9.3 MANUFACTURER AUTHORIZED PERSONNEL TRAINING:

A. Building Operating Personnel Training: Train Owner's building personnel in procedures for start-up, testing and operating lighting control system equipment. Provide video recorded training for Owners Use

END OF SECTION 26 5561

SECTION 11 1616

SECURITY SAFES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Furnish all labor, materials, equipment, tools and services required to fully complete all Security Safe work as is indicated on the drawings and / or specific herein oncluding, but not limited to, the following described items.
B. Security safe.
C. Do not inlcude sales tax, refer to Section 00 0104 - Notice to Contractors.

1.02 RELATED REQUIREMENTS

A. Section 03 3000 - Cast In Place Concrete: Anchorage of safes to floors.
B. Section 04 2731 - Reinforced Unit Masonry: Anchorage of safes to walls
C. Section 09 2116 - Gtypsum Board Assemblies: Anchorage of safes to walls.

1.03 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide manufacturer's product data..
C. Operation Data: Provide manufacturer's operatin instructions..
D. Maintenance Data: Provide manufacturer's maintenance products..
E. Warranty: Submit manufacturer warranty and ensure that forms have been completed in Murray City School District'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 safes to project site in manufacturer's packaging.
B. Store safes under cover and protected.

1.06 WARRANTY

A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
B. Provide five year manufacturer warranty.

PART 2 PRODUCTS

2.01 BASE BID MANUFACTURER

A. SentrySafe Group: www.sentrysafe.com.
    1. Security safe - Model D888.
B. Other Acceptable Manufacturers:
    1. Substitutions: See Section 01 6000 - Product Requirements.

2.02 MANUFACTURED UNITS

A. Security Safe:
    1. Exterior Dimensions: 37 3/4 inches (958mm) high by 21 11/16 inches (551mm) side by 19 1/2 inches (495mm) deep.

2. Interior Dimensions: 36 9/16 inches (928mm) high by 20 1/2 inches (520mm) side by 14 5/32 inches (359mm) deep.
3. Capacity: 6.11 cu. feet (173.2 cu. lit)
4. Weight: 230 lbs (104.3 kg)
5. Features:
   a. Combination Lock
   b. Hardened steel plate protects lock from drill attack.
   c. Re-locker.
   d. Solid steel pry-resistant door.
   e. Concealed hinges.
   f. 3 live-locking bolts.
   g. 3 adjustable shelves.
6. Hardware: Anchoring bolts for attachment to wall and floor.
7. Color: To be selected from manufacturer's full range.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verification of Conditions: Verify that wall and floor surfaces are completed.

3.02 INSTALLATION

A. Install in accordance with manufacturer's instructions.
B. Anchor to wall and floor.
C. Position so that hinge will be opposite to wall.

3.03 ADJUSTING

A. Adjust safes for smooth operation.

3.04 CLEANING

A. Clean exterir and interior of safes.

3.05 CLOSEOUT ACTIVITIES

A. Demonstrate proper operation of equipment to Owner's designated representative.

3.06 PROTECTION

A. Protect installed safes from subsequent construction operations.

END OF SECTION 11 1616

SECTION 11 3100

RESIDENTIAL APPLIANCES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Furnish all labor, materials, equipment, tools and services required to fully complete all Residential Appliances work as is indicated on the drawings and/or specified herein including, but not limited to, the following described items.
B. Residential applicances.
   1. An allowance shall be provided for items under this section.
C. Do not include sales tax, refer to Section 00 0104 - Notice to Contractors.

1.02 RELATED REQUIREMENTS

A. Division 22 - Plumbing: Plumbing connections for appliances.
B. Division 26 - Electrical: Electrical connections for appliances.

1.03 REFERENCE STANDARDS

A. UL (DIR) - Online Certifications Directory; Current Edition.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Product Data: Manufacturer's data indicating dimensions, capacity, and operating features of each piece of residential equipment specified.
C. Copies of Warranties: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than five years of documented experience.
B. Electric Appliances: Listed and labeled by UL and complying with NEMA standards.
C. Gas Appliances: Bearing design certification seal of AGA.

1.06 WARRANTY

A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
B. Provide five (5) year manufacturer warranty on refrigeration system of refrigerators.
C. Provide ten (10) year manufacturer warranty on magnetron tube of microwave ovens.
D. Provide ten (10) year manufacturer warranty on tub and door liner of dishwashers.

PART 2 PRODUCTS

2.01 APPLIANCES SCHEDULE

A. All Equipment Eligible for Energy Star Rating: Energy Star Rated.
   1. A104 Locker: Washer and Dryer.
   2. A122 Self-Contained: Washer and Dryer.
   3. B137 Faculty:
      a. (3) Microwave built-in.
      b. (1) Refrigerator.
   4. B145 Sick: Mini refrigerator / freezer.

5. C106 Laundry: Washer and Dryer.
6. D116 Laundry: Washer and Dryer.
7. D123 Laundry: Washer and Dryer.
8. D139 Foods:
    a. Student (3) electric range / oven.
    b. Student (3) gas range / oven.
    c. Student (6) microwaves.
    d. Demo station (1) electric cook top.
        1) 30 inch (4) burner.
    e. Demo station (2) refrigerator.
    f. Demo station (1) microwave built-in.
    g. Demo station (1) oven built-in.
    h. Demo station (1) dishwasher.
9. D140 Workroom: Washer and Dryer.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify utility rough-ins are present and correctly located.

3.02 INSTALLATION

A. Install in accordance with manufacturer's instructions.
B. Anchor built-in equipment in place.

3.03 ADJUSTING

A. Adjust operating equipment to efficient operation.

3.04 CLEANING

A. Remove packing materials from equipment.
B. Wash and clean equipment.

SECTION 11 4000

FOOD SERVICE EQUIPMENT

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK

A. The extent of Food Service Equipment is shown on the drawings and by schedules and equipment lists.

1.2 RELATED DOCUMENTS

A. Drawings and general provisions of the contract documents, including General and Supplementary Conditions and Division 1- Specification sections apply to work of this section.

B. Bidder is responsible for information and requirements located and identified on every part of the contract plans and specifications.

C. Mechanical and Electrical Work: Refer to this project's specification sections Division 15 and Division 16, respectively, for mechanical and electrical services and connections for individual items of Food Service Equipment.

1.3 QUALITY ASSURANCE

A. Standards:
   1. Except as otherwise indicated, comply with the following standards as applicable to the manufacture, fabrication and installation of the work of this section:
   2. NSF Standards: Comply with National Sanitation Foundation standards and criteria, and provide NSF "Seal of Approval" on each manufactured item and on major items of custom-fabricated work.
   3. UL Standards: For electrical components and assemblies provide either UL labeled products or, where no labeling service is available, "recognized markings" to indicate listing in the UL "Recognized Component Index".
   4. ANSI Standards: For gas-burning equipment. Comply with ANSI Z21-Series standard and provide labels indicating name of testing agency. Comply with ANSI B57.1 for compressed Gas Association for compressed gas piping. Comply with ANSI A40.4 and A40.6 for water connection air gaps and vacuum breakers.
   5. NFPA Standards: Comply with NFPA No. 96 for exhaust systems.
   6. ASME Code: Comply with ASME Boiler code requirements for steam generating and steam heated equipment; provide ASME inspection stamp and registration with National Board.
   7. National Electrical Code: comply with NFPA Volume 5 for electrical wiring and devices included with Food Service Equipment, ANSI C2 and C73, and applicable NEMA and NECA standards.

B. Manufactured Products; Fabrication: Provide standard or custom manufactured products to comply with requirements; otherwise, shop fabricate the work to the greatest extent possible, in shops which are skilled and experienced with a minimum of three years experience in the production of Food Service equipment.

1.4 SUBMITTALS

A. Production Data:
   1. Submit (7) complete sets, prior to ordering and/or fabrication, of manufacturer's or shop fabricator's product information and installation instructions for each item of Food Service Equipment. For operating equipment include data on performance and operating characteristics, power/fuel consumption, rough-in dimensions and sizes, drainage requirements and similar information.
   2. Provide (7) complete sets of bound maintenance manuals, operating instructions, spare parts list, precautions against hazards, manufacturer's warranties and similar information. Distribute an additional copy of installation and start-up instructions to the installer. Mark each data sheet or brochure with the project name and applicable project equipment number(s).

B. Shop Drawings
   1. Submit (7) complete sets, including (1) reproducible set, prior to ordering and/or fabrication, of shop drawings showing layouts, elevations, sections and details of custom fabricated work (work not shown by manufacturer's standard product data sheets). Show plan layouts at ¼" scale, elevations at ½" scale and details at 1 ½" or larger scales, as required.

C. Samples
   1. Submit (3) samples of each exposed finish on shop-fabricated and field-fabricated Food Service Equipment. Submit 12" squares of sheet materials and 24" lengths of linear materials. Architect for color, pattern, and texture will review samples; compliance with other requirements is the exclusive responsibility of the contractor.

1.5 PRODUCT HANDLING

A. Protect metal finishes from damage during shipping, storage, handling, installation and construction of other work in the same space. Wrap and crate each item of equipment as needed for protection from damage. Covers exposed stainless steel surfaces with self-adhesive protective paper, of a type recommended by the metal manufacturer, and do not remove until work is installed and ready for cleaning and start-up.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Metals:
   1. Stainless Steel (S/S): AISI Type 302/304, hardest workable temper, No. 4 directional polish.
   2. Galvanized Steel Sheet (G.I.): ASTM A526, except ASTM A527 for extensive forming; ASTM A525, G90 zinc coating, chemical treatment. Where painted finish is indicated, provide mill-phosphatized treatment in lieu of chemical treatment.
   3. Steel Sheet: ASTM A 569 hot-rolled carbon steel.
   4. Galvanized Steel Pipe: ASTM A53 or ASTM A120, welded or seamless, schedule 40, galvanized.
   5. Steel Structure Members: Hot rolled or cold formed, carbon steel unless stainless is indicated.
   6. Galvanized Finish (G.I): ASTM A123 hot-dipped zinc coating applied after fabrication.
   7. Aluminum: ASTM B209/B221 sheet, plate and extrusions (as indicated); alloy, temper and finish as determined by manufacturer/fabricator, except 0.40-mil natural anodized finish on exposed work unless another finish is indicated.

B. Plastic Laminate:
   1. NEMA LD3, Type 2, 0.051" thick, except Type 3, 0.042" for post-forming smooth (non-texture) white unless another texture and color is indicated or selected by Architect. Comply with NSF No. 35 where applicable.

C. Hardwood Work Surfaces:
   1. Laminated edge-grained hard maple (Acer saccharum), NHLA First Grade with Knots, holes and other blemishes culled out, kiln dried at 8% or less moisture, waterproof glue, machined, sanded, and finished with NSF approved oil-sealer.

D. Insulation:
   1. Cooled Component Insulation: Rigid, closed-cell polyurethane foam; either heat-aged slab stock for adhesive lamination with face sheets, or foamed in place using Freon 11 as expanding agent; k-value of 0.15; not less than 1.7 lbs. Per cu ft. density.
   2. Heated-Component Insulation: Rigid board, semi-rigid blanket or adhesive applied blanket of glass fiber or other mineral fiber insulation, certified by manufacturer to withstand long-term exposure to heat (temperature rating of each insulated equipment item) without deterioration. K-value of not more than 0.30; density of not less than 1.5 lbs. Per cu. Ft.

E. Joint Materials:
   1. Sealant: 1-part or 2-part, polyurethane or silicone based, liquid elastomeric sealant, non-solvent release type, Shore A hardness of 30 except 45 if subject to traffic.
   2. Backer Rod: Polyurethane rod stock, larger than joint width.
   3. Gaskets: Solid of hollow (but not cellular) neoprene or polyvinyl chloride; light gray, minimum of 40 Shore A hardness, self-adhesive or prepared for either adhesive application or mechanical anchorage.

F. Paint and Coatings:
   1. Provide the types of painting and coating materials which, after drying or curing are suitable for use in conjunction with foodservice, and which are durable, non-toxic, non-dusting, non-flaking, mildew resistant, and comply with governing regulations for Food Service.

G. Sound Deadening:
   1. Heavy-bodied resinous coating, filled with granulated cork or other resilient material, compounded for permanent, non-flaking adhesion to metal in a 1/8" thick coating.
      a. Galvanized Repair Paint: MIL-P-21035.
      b. Pretreatment: SSPC-PT2 or PT3, or FT C490.
   2. Primer Coating for Metal: FS TT-P-86 type suitable for baking where indicated.
   3. Enamel for Metal: Synthetic types, FS TT-P-491, type suitable for baking where indicated.

2.2 FABRICATED PRODUCTS

A. Hardware:
   1. General: Manufacturer's standard, but not less than ANSI 156.9 Type 2 (Institutional), satin finish stainless steel or dull chrome finish on brass, bronze or steel.
      a. Cabinet Catches: Heavy-duty magnetic type, except as otherwise indicated.
      b. Drawer Slides: Ball bearing type, side-mounting, self-closing, 250 lb. capacity.
      c. Sliding Door Hardware: Overhead track with tandem nylon wheel hangers for door leaves over 5 sq. ft. area; roller less sanitary slides for smaller doors (comply with NSF standards).

B. Casters:
   1. Type and size as recommended by caster manufacturer, NSF approved, for the type and weight of equipment supported; but not less than 4" diameter with 15/16" tread width, with sealed self-lubricating ball bearings, cadmium-plated steel disc wheels and solid light-gray synthetic rubber tires. Provide stainless steel horns and accessories. Unless otherwise indicated, equip each item with 2 swivel-type casters ad 2 fixed casters, and provide foot brakes on 2 castors on opposite corners of equipment.
      a. Caster Bumpers: Unless equipment item is equipped with another form of all-around protective bumper provide circular rotating bumper above each caster, 5" diameter tire of light gray synthetic rubber (hollow or closed-cell) on cadmium-plated disc.

C. Plumbing Fittings, Trim and Accessories:
   1. General: Where exposed or semi-exposed, provide bright chrome-plated brass or polished stainless steel units. Provide copper or brass where not exposed.

D. Water Outlets:
   1. Water Fill Devices: At sinks and at other locations where water is supplied (by manual, automatic or remote control), provide commercial quality faucets, valves, dispensers or fill devices, of the type and size indicated, and as required to operate as indicated.
   2. Vacuum Breakers: Provide with Food Service Equipment where specified/required.
   3. Waste Fittings: Except as otherwise indicated, provide 2" remote-lever waste valves, and 3.5" strainer basket. Integrate unit for direct connection with waste grinder where indicated.
   4. P-Traps: Include removable P-traps where drains are indicated for direct connection to drainage system.

E. Electrical Materials:
   1. General: Provide standard materials, devices and components as recommended by the manufacturer/fabricator, selected and installed in accordance with NEMA standards and recommendations; and as required for safe and efficient use and operation of the Food Service Equipment without objectionable noise, vibration and sanitation problems.
      a. Controls and Signals: Provide recognized and commercial grade signals, "on-off" push button or switches, and other speed and temperature controls as required for operation, complete with pilot lights and permanent signs and graphics to assist the user of each item. Provide stainless steel cover plates at control and signal electrical boxes.
      b. Connections: Equip each item requiring electrical power with either a terminal box for permanent connection or cord-and-plug for interruptible connection as indicated. Provide standard ground-type plugs, matching outlets (specified in Division 15), light gray (plug and cord)
      c. Motors: Totally enclosed type, except drip-proof type where not exposed to a dust or moisture condition; ball bearings, except sleeve bearings and small timing motors; winnings impregnated to resist moisture; horse-power and duty-cycle ratings as required for the service indicated.
      d. Power Characteristics: Refer to Division 16 specifications for project power characteristics. Also, refer to individual equipment requirements for loads and ratings.

2.3 FABRICATION OF METALWORK

A. General Fabrication Requirements:
   1. Remove burrs form sheared edges of metalwork, ease the corners and smooth to eliminate cutting hazard. Bend sheets of metal at not less than the minimum radius required avoiding grain-separation in the metal. Maintain flat, smooth surfaces without damage to finish. Reinforce metal at locations of hardware, anchorage and accessory attachments, wherever metal is less than 14 gauge or requires mortise application. Conceal reinforcements to the greatest extent possible. Weld in place on concealed faces.
   2. Where fasteners are permitted, provide Phillips head, flat or oval head machine screws. Cap threads with acorn nuts unless fully concealed in inaccessible construction, and provide nuts and lock washers unless metal for tapping is at least 12 gauge. Match fastener head finish with finish of metal fastened.
   3. Provide removable panels for access to mechanical and electrical service connections that are concealed behind or within foodservice equipment, but only where access is not possible and not indicated through other work.

B. Metal and Gauges:
   1. Except as otherwise indicated, fabricate exposed metalwork of stainless steel; fabricate the following components from the gauge of metal indicated, and other components from not less than 20-gauge metal:
      a. Table tops, Counter tops, Sinks, Drain-boards: 14 Gauge.
      b. Shelves: 16 gauge, 18 gauge if less than 12” wide.
      c. Front Drawer/Door Panels: 18 gauge (double-pan type).
      d. Single-Pan Doors and Drawer Fronts: 16 gauge
      e. Enclosed Base Cabinets: 18 gauge
      f. Enclosed Wall Cabinets: 18 gauge
      g. Exhaust Hoods: 18 gauge
      h. Pan Type Inserts and Trays: 16 gauge
      i. Skirts and Enclosure Panels: 18 gauge
      j. Closure and Trim strips over 4” wide: 18 gauge
      k. Hardware Reinforcement: 12 gauge
      l. Gusset Plates: 10 gauge

C. Work-Surface Fabrication:
   1. Fabricate metal work surfaces by forming and welding to provide seamless construction, using welding rods matching sheet metal, grinding and polishing. Where necessary for disassembly, provide waterproof gaskets draw-type joints with concealed bolting.
   2. Reinforce work-surfaces 30” o.c. both ways with galvanized or stainless concealed structural members, reinforce edges which are not self-reinforced by formed edges.
   3. Sound deaden underside of metal work-surfaces, including sinks and similar units, with a coating of sound deadening material. Hold coating back 3” from sanitary edges that are open for cleaning.

D. Structural Framing:
   1. Except as otherwise indicated, provide framing of minimum 1”-pipe-size round pipe or tube members, with mitered and welded joints and gusset plates, ground smooth. Provide 14 gauge stainless steel tube joints for exposed framing and galvanized steel pips for concealed framing.
   2. Where indicated, flange rear and end edges up to form splashes integrally with top, with vertical and horizontal corners coved on not less than ¼” radius, die formed. Turn back splashes 1” to wall across top and ends with rounded edge on break unless otherwise specified.
   3. For die-crimped edges, use inverted “V” ½” deep inside and 2” deep on outside, unless otherwise shown. For straight down flanges, make 1 ¾” deep on outside. For bull nose edges, roll down 1 ¾”.

a. Edges: die-formed, integral with top. For rounded corners, form to 1" radius, weld, and polish to original finish.

E. Field Joints:
1. For any field joint required because of size of fixture, butt-joint, reinforce on underside with angles of same material, bolt together with non-corrosive bolts and nuts, field weld, grind and polish.

F. Pipe Bases:
1. Construct pipe bases of 1-5/8" diameter 18 gauge stainless steel tubing. Fit legs with polished stainless steel sanitary adjustable bullet feet to provide for adjustment of approximately 1 ½" without exposing threads.
2. Space legs to provide ample support for tops, preclude any possibility of buckling or sagging and in no case more than 6'-0" centers.

G. Shelves:
1. Construct solid shelves under pipe base tables of 16 gauge stainless steel, with 1 ½" turned down and under edges, and 2" turn up at rear, against walls, welded to pipe legs.

H. Sinks:
1. Construct sinks of 14 gauge stainless steel No. 4 finish inside and outside. Form back, bottom, front, of one piece with ends, partitions, welded into place.
2. Partitions: double thickness, 1" minimum space between walls.
3. Cove interior vertical and horizontal corners of each tub not less than ¼" radius, die formed. Outside ends of drain boards to have roll rim risers not less than 2 ½" high.
4. Drill faucet holes in splashes 2 ½" below top edge on 8" centers.
5. Weld sinks set into drain boards by 1 ½" x 14 gauge stainless steel angle brackets, securely welded to sinks and galvanized cross angles spot welded to underside of drain boards.
6. Sink Drains: Install in center of bottom of each sink bowl 1 ½" I.P.S. quick opening pop-up lever type drain approximately 4" high, with a 4 ½" flange with lugs, and fit with 3-1/8" stainless steel strainer plate.
7. Lever Handle: Of sufficient length to extend to front of sink, threaded at one end and fitted with tension spring. No riveting, screws or soldering permitted to fit drains to sinks, with all parts of drains easily removable for servicing and replacement.
8. Slope bottom of sink bowls toward outlet. Include chrome-plated tailpiece and trap.

I. Workmanship:
1. Best quality in the trade. Field verify dimensions, check measurements before fabricating; conform all items to dimensions of building; neatly fit around pipes, offsets and other obstructions.
2. Fabricate only in accordance with approved shop drawings, showing all pipes, obstructions to be built around, and location of utilities and services.
3. After the General Contractor has approved Shop Drawings, he is responsible for preventing additional obstructions being placed in way of kitchen equipment.
4. Where equipment is exposed to customer view, provide enclosure of service lines, operating components and mechanical and electrical devices.

J. Enclosures:
1. Provide enclosures, including panels, housings and skirts for service lines, operating components and mechanical and electrical devices associated with the Food Service Equipment, except as specifically indicated to be "open".

K. Casework:
1. At fabricator's option, and unless otherwise indicated, provide either box-type face framing or open-channel-type (complying with NSF requirements in either case).

a. Enclosure: Except as otherwise indicated, provide each unit of casework (base, wall, overhead and free-standing) with a complete enclosure metal cabinet, including fronts, backs, tops, bottoms, and sides.
b. Door and Drawer Fronts: Except where single-pan construction is indicated, provide double-pan type, not less than 5/8" thick, with seams on inside face. Weld hardware reinforcement inside of inner pan. Sound deaden by either coating both pans on concealed face, or inserting mineral wool insulation between pans.
c. Shelves: Except as otherwise indicated, provide adjustable standards for positioning and support of shelves in casework. Turn back-edge of shelf unit up 2" and hem. Turn other edges down to form open channel. Reinforce shelf units to support 40 lbs. per sq. ft. loading, plus 100% impact loading.
d. Drawer Bodies: Except as otherwise indicated, draw-form drawer bodies from a single piece of metal to provide seamless construction. Flange top edge to protect slides from spillage.
e. Closed Base: Where casework is indicated to be located on a raised-floor base, prepare casework for support without legs, and for anchorage and sealant application, as required for a completely enclosed and concealed base.
f. Support from Floor: Equip floor-supported mobile units with casters and equip items indicated as "roll-out" units with manufacturer's standard one-directional rollers. Otherwise, and except for closed-base units, provide pipe or tube legs, with adjustable bullet-design feet for floor-supported items of fabricated metalwork. Provide 1 ½" adjustment of feet (concealed threading).

L. Exhaust Hood Fabrication:
1. Comply with NFPA -96, including Appendix A.
2. Grease Removal: Provide type indicated (removable filters if not otherwise indicated), with drip-channel gutters, drains and collection basing.
3. Light Fixtures: Fluorescent fixtures, UL listed for hoods with sealed safety lenses flush with inside of hood; stainless steel conduit for wiring/or UL listed for hoods, incandescent fixtures with sealed safety lenses surface mount.
4. Exhaust Duct: Galvanized steel, except stainless steel where exposed to view inside the building.
5. Exhaust Fan: Manufacturer's standard type (complying with section 5 of NFPA-96) (see also Mech. Section).

M. Fire Extinguishing System:
1. Material: System is to utilize a Wet Chemical system complying with NFPA No. 17 and 96 and UL 300.
2. The bidder is responsible to submit the necessary shop drawings and submittals required by the local authorities for a review of the Fire and Life Safety requirements of the specified system(s).
3. Shop Drawings: The Fire Suppression System Contractor is to submit shop drawings for the fire suppression system that are to include:
a. The name of the Owner/Occupant.
b. Site address and compass orientation indication.
c. Installing Fire Suppression Contractor's name, address and telephone number.
d. Graphic representation of scale for the drawings.
e. Hazard analysis with sufficient detail and dimensions to evaluate the hazard. Details are to include materials involved, location and arrangement and exposure to the hazard, combustibles, air handling equipment and heat sources.
f. Information and calculations on the amount of suppression agent to be used.
g. Indicate the size, length and arrangement of connected piping or piping and hose, including all fittings.
h. Indicate the description and location of nozzles to be used including flow rates of nozzles for engineered systems.
i. Indicate with details to identify apparatus and devices to be used.
j. Indicate location of all alarm-initiating and alarm-signaling devices.

k. Indicate location and function of operating devices, auxiliary equipment and electrical circuitry if used.
l. Show location of annunciation panel.
m. Show location of power connection for fire extinguishing system as applicable including breaker number(s).
n. Show location of gas connection and shut off as applicable.
o. Identify type and location of manual activating device to operate the fire extinguishing system.
p. Type and model of fire extinguishing devices.
q. Manufacturer of fire extinguishing devices.
r. Manufacturer catalog data sheets for fire extinguishing devices.
s. Listing and capability of all equipment with the fire extinguishing system.

4. Certificate of Compliance: The Fire Suppression System Contractor must provide at the completion of the project, certification that the system has been installed in accordance with the approved plans and the manufacturer's listed installation and maintenance manual.
5. Operation Instructions and As-Built Drawings: The Fire Suppression System Contractor must provide at the completion of the project, one set of manufacturer's listed installation and maintenance manuals or listed owner's manual that describes the system's operation, required maintenance and recharging to the Owner.
6. System Alterations: When field conditions necessitate any substantial changes from the approved plans, the corrected As-Installed plans are to be prepared and submitted.
7. Equipment List: Provide a complete equipment list for approval and before the installation of the fire alarm system identifying:

N. Shop Painting:
1. Clean and prepare metal surfaces to be painted; remove rust and dirt, apply treatment to zinc-coated surface that has not been mill-phosphatized. Coat welded and abraded areas of zinc-coated surfaces with galvanized repair paint. Apply 1.5 mil (dry film thickness) metal primer coating, followed by 2, 1.0 mil (dry film thickness) metal, enamel finish coatings. Bake primer and finish coatings in accordance with paint manufacturer's instructions for a baked enamel finish.

2.4 REFRIGERATION EQUIPMENT

A. Provide either single or multiple compressor units, as recommended by the manufacturer for the sizes and variations between connected evaporator loads as indicated.

B. Provide units of the capacities indicated, arranged to respond to multiple-evaporator thermostats and defrosting timers. Include coils, receivers, compressors, motors, motor starters, mounting bases, vibrations insulation units, fans, dryers, valves, piping, insulation, gauges, winter control equipment, high ambient control equipment, and complete automatic control system.

C. Refrigerant: Pre-charge units with type or types recommended by manufacturer for services indicated, with quick disconnect type connections where specified, ready to receive refrigerant piping runs to evaporators and (where remote) to condensers.

D. Provide air-cooled condensers, located with the compressors, complete with refrigerant piping installed at the factory. Locate exterior units as shown with weather housings and protective enclosures.

E. The minimum outdoor operating ambient temperature for design of units is -10 degrees F. Maximum ambient condition for load on the air cooled condenser is 95 degrees F. with 75% relative humidity in basically still air, or units to be provided with high ambient temperature controls.

2.5 CARBON DIOXIDE (CO2) EQUIPMENT

A. Where equipment requires connection with compressor CO2 cylinder for operation, provide 2-cylinders manifold and control system (integral with equipment) with proper connectors for Department of Transportation's (DOT) approved type cylinders, and complete with cylinder safety devices and supports. Comply with ANSA B57.1 "Compressed Gas Cylinder Valve Outlet and Inlet Connections", and comply with applicable standards of the Compressed Gas Association.

2.6 MISCELLANEOUS MATERIALS AND FABRICATION

A. Nameplate:
   1. Wherever possible, locate nameplates and labels on manufactured items in accessible position, but not within customer's normal view. Do not apply nameplates or labels on custom-fabricated work, except as required for compliance with governing regulations, insurance requirements or operator performance.

B. Manufactured Equipment Items:
   1. Furnish items as scheduled or herein specified. Verify dimensions, spaces, rough in and service requirements and electrical characteristics before ordering. Provide all trim, accessories, and miscellaneous items for complete installation.

PART 3 - EXECUTION

3.1 INSPECTION AND PREPARATION

A. The installer of the Food Service Equipment must examine the rough in of mechanical and electrical services by others, and the conditions under which the work is to be done and must verify dimensions of the services and substrates before fabricating the work. Notification of unsatisfactory conditions for the proper installation of the Food Service Equipment must be made in writing to the General Contractor.

B. Do not proceed with the fabrication and installation until unsatisfactory dimensions and conditions have been corrected in a manner acceptable to the installer.

C. Bidder is to verify site conditions to allow for the physical installation of each piece of equipment. Any consideration or associated cost required allowing for the installation is to be the responsibility of the bidder.

3.2 INSTALLATION

A. Water Connections: Install water connections and outlets at each item of equipment, with air gaps, vacuum breakers and similar provisions to comply with governing regulations, but not less than compliance with ANSI Standards A40.4 and A40.6.

B. Gas burners: Install gas burning appliances, including gas vents if necessary, to comply with NFPA No. 54.

C. Electrical Work: Assemble electrical components of equipment in accordance with applicable "Standards of Installation" by the National Electrical Contractors Association.

D. Service Line and Equipment Connections: Refer to division 15 sections for piping connections and piping systems. Refer to division 16 sections for electrical work including equipment connections.

E. Jointing and Anchoring:
   1. Set each items of non-mobile and non-portable equipment securely in place and level and adjust to correct height. Anchor to supporting substrate where indicated and where required for sustained operation and use without shifting or dislocation. Conceal anchorage wherever possible. Adjust counter tops and other work surfaces to a level tolerance of 1/6" (maximum offset, and plus-or-minus on dimensions, and maximum variation in 2'-0" run from level of indicated slope).
   2. Complete field assemble joints in the work (joints which cannot be completed in the shop) by welding, bolting and gaskets, or similar methods as indicated. Grind welds smooth and restore finish. Set or trim flush, except for "T" gaskets as indicated.
   3. Treat enclosed spaces (inaccessible after equipment installation) by covering horizontal surfaces with powdered borax at a rate of 4 oz. per sq. ft..
   4. Install closure plates and strips where required, with joints coordinated with units of equipment.
   5. Install sealant and gaskets all around each unit to make joints air tight, waterproof, vermin-proof, and sanitary for cleaning purposes.
   6. In general, make sealed joints not less than 1/8" wide, and stuff with backer rod to shape sealant bead properly, at ¼" depth.
   7. Shape exposed surfaces of sealant slightly concave, with edges flush with faces of material joint.
   8. At internal-corner joints, apply sealant or gasket to form a sanitary cove, of not less than 3/8" radius.
   9. Provide sealant-filled or gasket joints up to 3/8" joint width; metal closure strips for wider joints, with sealant application each side of strips. Anchor gaskets mechanically or with adhesives to prevent displacement.

3.3 CLEANING:

A. After completion of installation, and completion of other major work in Food Service areas, remove protective coverings, if any, and clean Food Service Equipment, internally and externally.

B. Restore exposed and semi-exposed finishes to remove abrasions and other damages; polish exposed-metal surfaces; touch-up painted surfaces. Replace work that cannot be successfully restored.

C. Remove and dispose off site any and all crating and packaging material.

3.4 TESTING AND START-UP:

A. Delay the start-up of equipment until service lines have been tested, balanced, and adjusted for pressure, voltage and similar consideration; and until water and steam lines have been cleaned and treated for sanitation.

B. Test each item of operational equipment to demonstrate that it is operating properly, and that controls and safety devices are functioning. Repair or replace equipment that is found to be defective in its operation, including units that are below capacity or operating with excessive noise or vibration.

C. Final Cleaning: After testing and start-up, clean and sanitize the Food Service Equipment, and leave in a condition ready for use in food service.

3.5 INSTRUCTIONS AND TRAINING:

A. Instruct the owner and any and all representatives of the owner in the proper operation and maintenance of each piece of operational equipment.

3.6 WARRANTY:

A. Each item is to include a parts and labor warranty of no less than one year, and longer as standard to the manufacturer's warranty.

3.7 INSTALLATION SCHEDULE:

A. Bidder is to review the projected construction schedule with the General Contractor prior to bidding and be able to accomplish the installation of the Food Service Equipment within the requirements of the project schedule.

3.8 BIDDING FORMAT:

A. Bidder will provide a completed bid form for each section of work being bid, as per the General Conditions of this specification.

B. The successful bidder will be required to submit an itemized list with individual costs for each piece of equipment included in the bid. Freight is to be included in the itemized cost for each item. Installation costs are to be itemized separately. A total amount is to be listed that includes all costs to complete the work.

C. Change orders requested by the owner or required by job conditions to add to the equipment requirements are to be on a 'cost plus' basis. Bidder is to submit a proposal for a percentage amount that will be applied to equipment costs for all change orders.

D. Change orders to delete equipment items will be directly related to the itemized costs breakdown provided.

3.9 DISCREPANCIES:

A. Any discrepancies or errors located or identified in or between the specifications and plans are to be brought to the attention of the designer in writing prior to, or with the bid submittal. Any such item not identified which would cause the bid to increase, will be the responsibility of the bidder to correct.

3.10 ACCEPTABLE SUBSTITUTE MANUFACTURERS:

A. The items listed are to be bid as specified. Manufacturers requesting to be approved as an equal substitute are to submit their request in writing to the Food Service Consultant for consideration at least (7) days prior to the bid date. Manufacturers will be considered approved and will be accepted as part of the bid only after being stated as such in writing in the form of an addendum and will be accepted only if they equally meet the specifications and standards of the specified manufacturer. A list of approved substitute manufacturers is to be submitted with the successful bidders itemized equipment list.

B. The bidder is solely responsible to insure that the requirements of any alternate or approved equal manufacturer's piece of equipment provided by them, comply with the design intent of these documents including physical size, utility requirements and function.

3.11 EXCLUSIONS:

A. The Owner reserves the right to exclude any and all items from the final contract.

PART 4 - ITEMIZED LIST OF EQUIPMENT

ITEM #K-01 DRY STORAGE SHELVING

Quantity: (1) lot
Manufacturer: Inter Metro
Model Number: MetroMax i
Dimensions: (3) 60”W x 24”D x 86”H
(4) 54”W x 24”D x 86”H
Utility Requirements: None
Accessories: A) Lot to include: (15) #MX2460G shelves
(20) #MX2454G shelves
(20) #MX86P posts
(40) ‘S’ clips
Installation Instructions: A) Assemble, set and level as per plan. (Verify actual field dimensions for compliance.)

ITEM #K-02 WALK-IN COOLER/FREEZER BOX

Quantity: (1) lot
Manufacturer: Kolpack
Model Number: #NS (Nominal Size/Custom)
Dimensions: Freezer: 9’-7 1/2”W x 14’-5 1/2”D x 9’-6”H
Cooler: 9’-7 1/2”W x 14’-5 1/2”D x 9’-6”H
Utility Requirements: A) (2) 115/60/1, 2.8 amps at door. Interconnect with (8) lights. (4) in freezer and (4) in each cooler.
B) (2) 115/60/1, .2 amps, heated air vent at doors. (2) each
Accessories: A) Provide (2) each 36” stainless steel door unit with view window. (1) at each box.
B) Provide (6) additional vapor proof light for a total of (4) lights at freezer box and (4) lights in each cooler.
C) Provide vacuum relief heated air vent at each door.
D) Provide side trim to walls.
E) Common center wall between coolers and freezer.
F) Provide additional door hinge to each door.
G) White finish on exposed exterior surface of box. Galvalume finish on all other exterior surfaces of box.
H) White galvalume finish on interior exposed surface of box.
I) Provide ‘Thermo Curtain’ at each door.
J) Provide a temperature sensor capable of being connected to a communications data port.
Installation Instructions: A) Assemble and set in place as per plans to sub floor with PVC floor screens.
B) General Contractor to provide floor tile and base.
C) Tile floor with base to be applied after box installation. Door height to compensate for floor tile dimension.
D) General Contractor to provide an insulated floor system at freezer as per plans and details.

ITEM #K-03A COOLER REFRIGERATION SYSTEM: CONDENSER

Quantity: (1) system
Manufacturer: Kolpak
Model Number: #PC149MOP-3
Dimensions: 33”W x 26”D x 20”H
Utility Requirements:
A) 208/60/3, 7.7 amps, 1.5 H.P. (To be connected to emergency generator)
B) Interconnect refrigeration lines with item #K-3B
Accessories:
A) Include: Pre piped Tecumseh hermetic compressors with dryers, sight glasses and head pressure controls; pre-wired electrical panel, defrost clock, pressure controls and crankcase heaters. (Verify all requirements with manufacturer).
B) Interconnect with evaporator item #K-3B.
C) Verify location of unit on roof.
D) Provide with low ambient temperature kit.
E) Provide with mounting skids.
F) Size to maintain +35°F in box as per plan.
G) Exterior housing.
H) Electrical Contractor to interconnect refrigeration system as required.
Installation Instructions:
A) Mount on roof as per manufacturers shop drawings.
B) Interconnect refrigeration lines with blower Coil, item #K-3B.
C) Set refrigeration equipment on roof curb, mount evaporator coils in cooler/freezer box, provide and install expansion coils, T-Stat, solenoid valves.
D) Provide and install refrigeration piping, insulation, fittings, hangers, supports and hook-ups.
E) Charge each system with the refrigerant as specified by the manufacturer.
F) Check, test, start up and final adjustments are to be provided.
G) Provide and install drain lines from blower coils in box.
H) General Contractor to provide floor and wall penetrations to roof installation location, roof curb and roof penetration sealing at refrigeration lines.
I) Electrical Contractor to interconnect refrigeration system as required.

ITEM #K-03B COOLER REFRIGERATION SYSTEM: BLOWER COIL

Quantity: (1) system
Manufacturer: Kolpak
Model Number: #AM26-115-1EC-PR-4
Dimensions: 46”W x 15”D x 16”H
Utility Requirements:
A) 120/60/1, 3.8 amps. (To be connected to emergency generator)
B) Indirect drains to floor sink.
C) Interconnect refrigeration lines with item #K-3A.
Accessories:
A) Mounting hardware.
B) Size to maintain +35°F in box as per plan.
C) Provide a temperature sensor capable of being connected to a communications data port.
Installation Instructions:
A) Mount from Walk-In Box ceiling.
B) Interconnect with Refrigeration Condenser Item #K-3A.

ITEM #K-04 SPARE NUMBER

ITEM #K-05A FREEZER REFRIGERATION SYSTEM: CONDENSER

Quantity: (1) system
Manufacturer: Kolpak
Model Number: #PC299LOP-3
Dimensions: 33”W x 40”D x 23”H
Utility Requirements:
A) 208/60/3, 14.3 amps, 3 H.P. (To be connected to emergency generator)
B) Interconnect refrigeration lines with item #K-5B
Accessories:
A) Include: Pre piped Tecumseh hermetic compressors with dryers, sight glasses and head pressure controls; pre-wired electrical panel, defrost clock, pressure controls and crankcase heaters. (Verify all requirements with manufacturer).
B) Interconnect with blower coils #K-5B.
C) Verify location of unit on roof.
D) Provide with low ambient temperature kit.
E) Provide with mounting skids.
F) Size to maintain +0°F in box as per plan.
G) Exterior housing
Installation Instructions:
A) Mount on roof as per manufacturers shop drawings.
B) Interconnect refrigeration lines with blower Coil, item #K-5B.
C) Set refrigeration equipment on roof curb, mount evaporator coils in cooler/freezer box, provide and install expansion coils, T-Stat, solenoid valves.
D) Provide and install refrigeration piping, insulation, fittings, hangers, supports and hook-ups.
E) Charge each system with the refrigerant as specified by the manufacturer.
F) Check, test, start up and final adjustments are to be provided.
G) Provide and install drain lines from blower coils in box.
H) General Contractor to provide floor and wall penetrations to roof installation location, roof curb and roof penetration sealing at refrigeration lines.
I) Electrical Contractor to interconnect refrigeration system as required.
J) Electrical Contractor to provide defrost electrical inter-connect to freezer units.

ITEM #K-05B FREEZER REFRIGERATION SYSTEM: BLOWER COIL

Quantity: (1) system
Manufacturer: Kolpak
Model Number: #EL36-120-2EC-PR-4
Dimensions: 64”W x 15”D x 16”H
Utility Requirements:
A) Fan: 208/60/1, 1.35 amps. (To be connected to emergency generator)
Heater: 208/60/1, 13 amps. (To be connected to emergency generator)
B) Indirect drains to floor sink.
C) Interconnect refrigeration lines with item #K-5A
Accessories:
A) Interconnect with condenser Item #K-5A.
B) Mounting Hardware.
C) Size to maintain +0°F in box as per plan.
D) Provide a temperature sensor capable of being connected to a communications data port.
Installation Instructions:
A) Mount from walk-in ceiling.

B) Interconnect with Refrigeration Condenser, #K-5A as part of pre-assembled remote system.
C) Electrical Contractor to interconnect refrigeration system as required including defrost cycle.

ITEM #K-06 WALK-IN BOX SHELVING

Quantity: (1) lot
Manufacturer: Inter Metro
Model Number: MetroMax i
Dimensions: (2) 60”W x 24”D x 74”H
(8) 54”W x 24”D x 74”H
Utility Requirements: None
Accessories: A) Lot to include: (8) #MX2460G shelves
(24) #MX2454G shelves
(32) #MX74P posts
(24) ‘S’ clips
Installation Instructions: A) Assemble, set and level as per plan. (Verify actual field dimensions for compliance.)

ITEM #K-07 WALK-IN DUNNAGE RACK

Quantity: (1) lot
Manufacturer: InterMetro
Model Number: #HP2248PD
Dimensions: (4) 36”W x 22”D x 14 1/2”H
Utility Requirements: None
Accessories: A) Polymer material with bow tie.
Installation Instructions: A) Assemble and set in place as per plan.

ITEM #K-08 GENERAL PURPOSE CART: MOBILE

Quantity: (1) each
Manufacturer: New Age
Model Number: #97180
Dimensions: 22”W x 37”D x 41”H
Utility Requirements: None
Accessories: A) Casters with brakes.
Installation Instructions: A) Set in place as per plan.

ITEM #K-09 SPEED RACK: MOBILE

Quantity: (2) each
Manufacturer: New Age
Model Number: #1331 PBCL
Dimensions: 23”W x 30”D x 70”H
Utility Requirements: None
Accessories: A) Perimeter bumpers.
B) (20) 18” x 26” pan capacity.
C) Set of heavy-duty locking casters.
Installation Instructions: A) Assemble and set in place as per plan.

ITEM #K-10	WALL MOUNT HAND SINK
Quantity:	(6) each
Manufacturer:	Advance
Model Number:	#7-PS-50
Dimensions:	17”W x 15”D x 13”H
Utility Requirements:	A) 1/2” hot and cold water. B) 1-1/2” Direct drain.
Accessories:	A) Provide with towel and soap dispenser assembly. B) Provide with heavy duty 1/4 turn faucet and drain.
Installation Instructions:	A) Clip and seal to wall as per plan. B) General Contractor to provide blocking in wall as required.

ITEM #K-11	STAINLESS STEEL WORK TABLE
Quantity:	(1) each
Manufacturer:	Custom Metal Fabricated
Model Number:	Custom as per plans and details
Dimensions:	96”W x 30”D x 36”H
Utility Requirements:	None.
Accessories:	A) 8” back splash. B) Stainless steel under shelf. C) (2) Drawer mounted at each side.
Installation Instructions:	A) Set and level as per plan. B) Clip and seal back splash to wall.

ITEM #K-12	STAINLESS STEEL WALL SHELF
Quantity:	(1) each
Manufacturer:	Custom Metal Fabricated
Model Number:	Custom, as per plans and details.
Dimensions:	96’W x 1’-2”D.
Utility Requirements:	None
Accessories:	A) Provide with (3) mounting brackets.
Installation Instructions:	A) Mount to wall at +62” A.F.F. as per plan. B) General Contractor to provide blocking in wall as required.

ITEM #K-13	SLICER
Quantity:	(1) each
Manufacturer:	Hobart
Model Number:	#HS9
Dimensions:	25”W x 28”D x 24”H
Utility Requirements:	A) 120/60/1, 5.6 amp.
Accessories:	A) Automatic, heavy duty, angle feed 13” cleancut blade. B) Removeable knife feature.
Installation Instructions:	A) Set in place as per plans.

ITEM #K-14	30 QUART MIXER
Quantity:	(1) each
Manufacturer:	Hobart
Model Number:	#HL-300
Dimensions:	21”W x 22”D x 45”H
Utility Requirements:	A) 120/60/1, 9.5 amp.
Accessories:	A) Timer, thermal overload and starter. B) Three fixed speeds. C) Stainless steel bowl and bowl guard. D) Attachment hub. E) “B” beater and “D” stainless steel wire whip
Installation Instructions:	A) Assemble and set in place as per plan.

ITEM #K-15	STAINLESS STEEL THREE COMPARTMENT PREP SINK
Quantity:	(1) each
Manufacturer:	Custom Metal Fabricated
Model Number:	Custom as per plans and details
Dimensions:	108”W x 30”D x 44”H
Utility Requirements:	A) 1/2” Hot and cold water. B) 1-1/2” Indirect drain.
Accessories:	A) 8” Back splash B) (2) 12” swing faucet. C) (3) Lever handle drains. D) (3) 20” x 24” sink compartments. E) (2) 24” drain boards.
Installation Instructions:	A) Set and level as per plan. B) Clip and seal back splash to wall.

ITEM #K-16	STAINLESS STEEL UTENSIL RACK
Quantity:	(1) each
Manufacturer:	Custom Metal Fabricated
Model Number:	Custom, as per plans and details.
Dimensions:	9’-0”W x 1’-2”D
Utility Requirements:	None
Accessories:	A) Provide with (4) mounting brackets. B) Provide with (24) pothooks. C) Provide with upper and middle stainless steel hanging bar.
Installation Instructions:	A) Mount to wall at +78” a.f.f. as per plan. B) General Contractor to provide blocking in wall as required.

ITEM #K-17	STAINLESS STEEL ISLAND WORK TABLE
Quantity:	(4) each
Manufacturer:	Custom Metal Fabricated
Model Number:	Custom as per plans and details
Dimensions:	96”W x 36”D x 36”H
Utility Requirements:	None.
Accessories:	A) Flat top. B) Stainless steel under shelf. C) (2) Drawers mounted at each side.
Installation Instructions:	A) Set and level as per plan.

ITEM #K-18 KITCHEN SHELVING: MOBILE

Quantity: (2) each
Manufacturer: Inter Metro
Model Number: MetroMax i
Dimensions: 48”W x 24”D x 74”H
Utility Requirements: None
Accessories: A) Each to include: (4) #MX2448G Shelves
(4) #MX74P posts
(1) Set of four stem swivel lockable casters with bumpers.
Installation Instructions: A) Assemble, set and level as per plan.

ITEM #K-19 SPARE NUMBER

ITEM #K-20 SPARE NUMBER

ITEM #K-21 STAINLESS STEEL WORK TABLE

Quantity: (2) each
Manufacturer: Custom Metal Fabricated
Model Number: Custom as per plans and details
Dimensions: 72”W x 30”D x 36”H
Utility Requirements: None.
Accessories: A) 8” back splash.
B) Stainless steel under shelf.
C) (2) Drawers mounted at each side.
Installation Instructions: A) Set and level as per plan.
B) Clip and seal back splash to wall.

ITEM #K-22 STAINLESS STEEL WALL SHELF

Quantity: (2) each
Manufacturer: Custom Metal Fabricated
Model Number: Custom, as per plans and details.
Dimensions: 72’W x 1’-2”D.
Utility Requirements: None
Accessories: A) Provide with (2) mounting brackets.
Installation Instructions: A) Mount to wall at +62” A.F.F. as per plan.
B) General Contractor to provide blocking in wall as required.

ITEM #K-23 MICROWAVE OVEN

Quantity: (1) each
Manufacturer: Panasonic
Model Number: #NE-12521
Dimensions: 17”W x 20”D x 14”H
Utility Requirements: A) 120/60/1, 17.7 amp.
Accessories: A) Standard features.
Installation Instructions: A) Set in place as per plan.

ITEM #K-24	FOOD PROCESSOR
Quantity:	(1) each
Manufacturer:	Hobart
Model Number:	#HCM61
Dimensions:	12W x 14”D x 19” H.
Utility Requirements:	A) 120/60/1, 15.4 amp
Accessories:	A) Provide ‘Coolcutter’ cut/mix knives. Verify knives required with opertor.
Installation Instructions:	A) Set in place as per plans.

ITEM #K-25	STAINLESS STEEL EXHAUST HOOD with MAKE UP AIR PLENUM
Quantity:	(1) loth
Manufacturer:	Captiveaire
Model #:	#6030 ND-2-PSP-F
Dimensions:	(2) each 16’-6”W x 5’-0”D x 2’-6”H in Four Sections 8’-3”W x 5’-0”D x 2’-6”H (16” Additional depth at make-up air plenum at each hood). To make two 16’-6” wide hoods at both sides of UDS, item #K-27, as per plan
Utility Requirements:	A) 120/60/1, 1,800 watt. Pre-wired to Utility Distribution System, item #K-27. B) Total exhaust of 7672 CFM with (2) 14”D duct collars at 1856 cfm at 0.741”W.C. SP at 1736 duct velocity and (2) 14”D duct collars at 1980 cfm at 0.843”W.C. SP at 1852 duct velocity. C) Total make-up air of 5936 CFM with (4) 12” x 28” duct collars at 742 cfm at 0.207”W.C. SP and (4) 12” x 28” duct collars at 792 cfm at 0.234”W.C. SP.
Accessories:	A) Perforated front, low velocity, make-up air plenum. B) Recessed round LED fixture and LED light with 3500K warm output. C) Stainless steel enclosure panels from hood to ceiling. D) Wall Canopy type units with 12” spacer to accommodate Utility Distribution System, item #K-27. E) Provide duct heat sensor assembly at each exhaust duct connections including control box to comply with current code.
Installation Instructions:	A) Mount from structure above as per plan. (2,161 lb.) B) Mechanical Contractor to connect exhaust ducts and make up air ducts to duct collars. C) Heat Sensor to be installed by KEC and interconnected by the Electrical Contractor to the hood exhaust system as required to activate exhaust system when activated by heat.

ITEM #K-26 FIRE PROTECTION SYSTEM

Quantity: (1) lot
Manufacturer: Ansul
Model Number: #R-102
Dimensions: -
Utility Requirements: -
Accessories:
A) Provide gas shut off valve and five electrical shut off contacts as required for protected equipment, for installation by mechanical and electrical contractors.

Installation Instructions:
A) Provide a complete self-contained and certified system.
B) To protect Exhaust Hoods, items #K-25. Tanks to be located on end of hood as per plan. Verify placement.
C) Al conduits and piping to be concealed in walls and ceiling. Exposed piping in hood to be chrome.
D) Verify placement of emergency pull station with architect.

ITEM #K-27 UTILITY DISTRIBUTION SYSTEM

Quantity: (1) system
Manufacturer: Captiveaire
Model #: #UDS-ISLAND
Dimensions: 16’-6”W x 12”D x 2’-6”H (7’-0” height to hood)
Utility Requirements:
A) Single point 120-208/60/1-3 electrical connection, to provide power for equipment under the hood including hood lights as per plan. Total 40 amp, 22.9 amp connected, 17.1 amp future load.
B) Provide switch/controls for exhaust hood.
C) Single point gas connection, to provide gas for equipment under the hood. Total 2,900 MBH, 1,196 MBH connected, 1,704 future load.
D) Single point hot and cold water connection, to provide water to equipment under the hood.

Accessories:
A) 16’-6” x 12”D x 30”H, 16 gauge stainless steel chase with factory supplied electrical wiring and plumbing as required by equipment in plan.
B) Floor mounted with 6’-8” side risers with 3” adjustable riser trim collar.
C) Electrical service is to be complete including main panel, interchangeable point of use circuit breaker, light switch for hood lights, and switch for hood exhaust/make up air system and grounding type receptacles for each power point connection.
D) Hot and cold water lines are factory plumbed to individual connection with shut off valves, quick disconnects and NSF approved flexible hoses for each piece of equipment. 2” looped gas supply system, factory plumbed with individual shut off valves, quick disconnects and NSF/AGA approved flexible gas hoses for each piece of equipment.
E) Provide one gas solenoid valve factory mounted and wired, and electrical power shut off as required.
F) Provide (2) water filters with windows.

Installation Instructions:
A) Set and level as per plan. Extend to bottom of hoods

ITEM #K-28 SPARE NUMBER

ITEM #K-29 SPARE NUMBER

ITEM #K-30 SPARE NUMBER

ITEM #K-31 STACKED CONVECTION OVEN

Quantity: (2) each
Manufacturer: Vulcan
Model Number: #VC66D
Dimensions: 41”W x 42”D x 70”H
Utility Requirements:
A) (2) 3/4” gas, 100,000 BTU/hr
B) (2) 115/60/1, 8 amp.
Accessories:
A) Stainless steel finish including top and sides.
B) Set of heavy-duty locking casters.
C) Provide with cord and plug.
D) Manifold each oven gas connection to a single point gas connection.
E) 48” Quick disconnect flexible hose gas connection with wall tether.
F) Provide leak limiter pressure regulator as required.
G) Bakery deep depth.
Installation Instructions:
A) Set in place as per plan.
B) Rough-in connection to be quick disconnect.
C) Adjust for local altitude as required.

ITEM #K-32 COMBI STEAMER/OVEN

Quantity: (2) each
Manufacturer: Rational
Model Number: #iCombi Pro 6-full size + 6-full size G UG
Dimensions: 42”W x 47”D x 74”H (77”H to top of flue).
Utility Requirements:
A) (2) each 3/4” natural gas, 106,500 BTU/Hr. from UDS, item #K-27.
B) (2) each 208/60/1, 900 watt. from UDS, item #K-27.
C) (2) each 3/4” cold water. Drinking quality only. (14.5) to (87) psi required. Consumes 3.17 GPM. Provide flexible connection to allow for movement of oven from UDS, item #K-27.
D) 1” cold water direct connection to drain tempering device connected to drain after manifold connection from UDS, item #K-27.
E) (2) each 2” indirect drain manifolded to a single connection to floor sink.
Accessories:
A) Rear gas connection.
B) Clima Plus
C) Dynamic air circulation
D) Delta-T cooking.
E) Right hand door hinge.
F) Care System cleaning.
G) (12) 18” x 26” or (24) 12” x 20” pan capacity.
H) Accessories including:
   a. (10) each 12”x 20” x 2-1/2” perforated gastronorm pans.
   b. (5) each 12” x 20” stainless steel grid shelves.
   c. (10) each 12” x 20” fry baskets.
   d. (4) each 12” x 20” Teflon perforated baking trays.
   e. (4) 12” x 20” non-stick coated pans.

I) Rational Certified Installation.
J) Rational Certified Chef training
K) Stackable Combi-Duo kit
L) Adjustable 6” feet
M) Water filter to meet quality standards set above.
N) 48” Quick disconnect flexible hose gas connection with wall tether.
O) Provide leak limiter pressure regulator as required.
P) Provide CDF #DTV-HV drain water tempering kit for installation at drain by plumbing contractor.

Installation Instructions:
A) Assemble and set in place and level as per plan, set as far back under the hood as possible.
B) Utility connection to be quick disconnect to Utility Distribution System, item #K-38.
C) Adjust for local altitude as required.

ITEM #K-33 40 GALLON TILT SKILLET

Quantity: (1) each
Manufacturer: Cleveland
Model Number: #SGM-40-T
Dimensions: 48”W x 34”D x 39”H
Utility Requirements:
A) 3/4” natural gas, 130,000 BTU/Hr.
B) 1/2” hot and cold water.
Accessories:
A) Console mounted water faucet.
B) Pan carrier.
C) Cord and plug.
D) 48” Quick disconnect flexible hose gas connection with wall tether.
E) Provide leak limiter pressure regulator as required.
Installation Instructions:
A) Set and level as per plans.
B) Rough-in connection to be quick disconnect.
C) Adjust for local altitude as required.

ITEM #K-34 FLOOR TROUGH: PROVIDED BY PLUMBING DIVISION

Quantity: (1) each
Dimensions: 8’-0”W x 18”D

ITEM #K-35 25 GALLON TILT KETTLE

Quantity: (1) each
Manufacturer: Cleveland
Model Number: #KGL-25-T
Dimensions: 42”W x 37”D x 40”H
Utility Requirements:
A) 120/60/1, 5 amps.
B) 1/2” hot and cold water for faucet.
C) 3/4” Natural gas, 90,000 BTU/Hr.
Accessories:
A) Smooth action tilt.
B) 2” tangent draw off valve.
C) Flanged feet.
D) Kettle markings.
E) Hot and cold faucet.
F) Spring assisted kettle cover. Verify clearance to adjacent equipment.
G) 48” Quick disconnect flexible hose gas connection with wall tether.
H) Provide leak limiter pressure regulator as required

Installation Instructions:	A) Set and level as per plans. Bolt to floor. B) Rough-in connection to be quick disconnect. C) Adjust for local altitude as required.

ITEM #K-36 SIX BURNER RANGE WITH CABINET BASE

Quantity:	(1) each
Manufacturer:	Vulcan
Model Number:	#VGB36B
Dimensions:	36”W x 38”D x 36”H
Utility Requirements:	A) 3/4” natural gas, 198,000 BTU/Hr.
Accessories:	A) Casters, 2 with locks. B) Rear gas connection. C) Stainless steel sides. B) Open front cabinet base. D) (6) burners. E) 48” Quick disconnect flexible gas hose connector and fittings, with wall tether. F) Provide leak limiter pressure regulator as required.
Installation Instructions:	A) Set in place as per plans. B) Rough-in connection to be quick disconnect. C) Adjust for local altitude as required.

ITEM #K-37 FLAT TOP GRIDDLE RANGE WITH CABINET BASE

Quantity:	(1) each
Manufacturer:	Vulcan
Model Number:	#VGMT36B
Dimensions:	36”W x 38”D x 36”H
Utility Requirements:	A) 3/4” natural gas, 90,000 BTU/Hr. B) 115/60/1, 1 amp.
Accessories:	A) Casters, 2 with locks. B) Rear gas connection. C) Stainless steel sides. D) Open front cabinet base. E) Flat top griddle top. F) 48” Quick disconnect flexible gas hose connector and fittings, with wall tether. G) Provide leak limiter pressure regulator as required.
Installation Instructions:	A) Set in place as per plans. B) Rough-in connection to be quick disconnect. C) Adjust for local altitude as required.

ITEM #K-38 STAINLESS STEEL CORNER GUARDS

Quantity:	(1) lot
Manufacturer:	Custom Metal Fabricated
Model Number:	Custom, as per plans and details.
Dimensions:	3” x 3” x 48”H
Utility Requirements:	None
Accessories:	A) Lot to include approximately (47) guards as per plan.
Installation Instructions:	A) Attach to wall with glue and stainless steel screws as per plan.

ITEM #K-39 LOCKERS: PROVIDED BY OTHER SECTION

Quantity: (1) lot

ITEM #K-40 SPARE NUMBER

ITEM #K-41 SPARE NUMBER

ITEM #K-42 KITCHEN SHELVING

Quantity: (4) each
Manufacturer: Inter Metro
Model Number: MetroMax i
Dimensions: (4) 60”W x 24”D x 74”H
(1) 54”W x 24”D x 74”H
Utility Requirements: None
Accessories: A) Each to include: (16) #MX2460G Shelves
(4) #MX2454G Shelves
(20) #MX74P posts
Installation Instructions: A) Assemble, set and level as per plan.

ITEM #K-43 STAINLESS STEEL FOUR COMPARTMENT SINK

Quantity: (1) each
Manufacturer: Custom Metal Fabricated
Model Number: Custom, as per plans and details.
Dimensions: 15’-6”W x 30”D x 44”H
Utility Requirements: A) 1/2” hot and cold water.
B) 1-1/2” indirect drain.
Accessories: A) (2) each, 14” faucet.
B) (4) each, lever operated drain with built in overflow.
C) (3) each faucet knock outs.
D) Sink compartments to be 30”W x 24”D.
E) 30" Drain board on each side.
Installation Instructions: A) Set and level as per plan.
B) Clip and seal back splash to wall.

ITEM #K-44 STAINLESS STEEL POT RACK/WALL SHELF

Quantity: (1) each
Manufacturer: Custom Metal Fabricated
Model Number: Custom, as per plans and details.
Dimensions: (1) 11’-2”W x 12”D & (1) 3’-4”W x 12”D
Utility Requirements: None
Accessories: A) (48) Pothooks.
Installation Instructions: A) Mount level to wall at +6’6” a.f.f. to top of unit shelf as per plan.
B) General Contractor to provide wall blocking as required.

ITEM #K-45	STAINLESS STEEL WALL FLASHING
Quantity:	(1) lot
Manufacturer:	Custom Metal Fabricated
Model Number:	Custom, as per plans and details.
Dimensions:	5’-3” x 15’-10” “L” to Ceiling.
Utility Requirements:	None
Accessories:	A) Stainless steel wall flashing on pot sink wall from floor base to ceiling. Include left side wall to center of wall. B) Provide stainless steel “J” and “T” trim at seams and at top edge.
Installation Instructions:	A) Mount to wall as required.

ITEM #K-46	PRE-RINSE SPRAY
Quantity:	(1) each
Manufacturer:	T & S Brass
Model Number:	#B-0133-B
Dimensions:	36”H
Utility Requirements:	A) 1/2” hot and cold water.
Accessories:	A) Provide wall bracket. A) Splash Mount. B) Provide with #B0107 Spray valve
Installation Instructions:	A) Mount to Four Compartment Sink, item #K-43, as per plan.

ITEM #K-47	HOSE REEL
Quantity:	(1) each
Manufacturer:	T&S Brass
Model Number:	#B-1444-CV
Dimensions:	Verify
Utility Requirements:	A) 1/2” Hot & Cold Water.
Accessories:	A) Concealed Installation. B) Retractable Reel. C) Provide with continuous pressure back flow preventors. D) Shut off valve. E) 50’ of hose. F) High pressure trigger gun spray #MV-2522. G) Stainless steel enclosure
Installation Instructions:	A) Mount to underside of right drain board of Four Compartment Sink, item #K-43, as per plan. Verify height at top to be approximately 30” a.f.f. B) Install mixing valve with bracket to underside of drainboard.

ITEM #K-48 SPARE NUMBER

ITEM #K-49	ICE MAKER and BIN
Quantity:	(1) each
Manufacturer:	Manitowoc
Model Number:	#IYT-1500A with #D-970 (bin).
Dimensions:	48”W x 34”D x 80”H
Utility Requirements:	A) 3/8” cold water. B) 1/2” indirect drain to floor sink. C) 3/4” indirect drain to floor sink. D) 208/60/1, 18.5 amp.
Accessories:	A) Stainless steel finish. B) Provide filter for incoming water. C) Self contained, air-cooled.
Installation Instructions:	A) Water pressure to be 20-80 PSIG. B) Set and level as per plan.

ITEM #K-50	SPARE NUMBER

ITEM #K-51	STAINLESS STEEL DIRTY DISH TABLE
Quantity:	(1) each
Manufacturer:	Custom Metal Fabricated
Model Number:	Custom, as per plans and details.
Dimensions:	8’-6”W x 2’-6”D x 34”H. Verify with field measurements.
Utility Requirements:	A) 1-1/2” indirect drain to floor sink
Accessories:	A) Built-in pre-rinse sink with removable scrap basket. B) 8” back splash. C) 4’-0” stainless steel under shelf as per plan.
Installation Instructions:	A) Set and level as per plans. B) Clip and seal back splash to wall. C) Verify entry requirements of dish machine to gently slope table back to machine.

ITEM #K-52	STAINLESS STEEL DISH RACK WALL SHELF
Quantity:	(1) each
Manufacturer:	Custom Metal Fabricated
Model Number:	Custom, as per plans and details.
Dimensions:	4’-6”W x 21”D (Angled)
Utility Requirements:	None
Accessories:	A) Provide with (2) mounting brackets.
Installation Instructions:	A) Mount to wall at +54” a.f.f. to the bottom, as per plan. B) General Contractor to provide blocking as required.

ITEM #K-53	PRE-RINSE SPRAY
Quantity:	(1) each
Manufacturer:	T & S Brass
Model Number:	#B-0133-B
Dimensions:	36”H
Utility Requirements:	A) 1/2” hot and cold water.
Accessories:	A) Provide wall bracket. B) Splash Mount. C) Provide with #B0107 Spray valve
Installation Instructions:	A) Mount to dirty dish table item #K-51 as per plan.

ITEM #K-54	DISHWASHER: ELECTRIC
Quantity:	(1) each
Manufacturer:	Hobart
Model Number:	#CL-54eN-EGR ELECTRIC
Dimensions:	54”W x 31”D x 69”H
Utility Requirements:	A) 1/2” Hot water connection. 110 Degrees F. 15 to 25 PSI required. B) 1/2” Cold water connection, maximum 80 Degree F. C) 1/8” Inlet to be provided for detergent dispenser as required. D) 2” indirect drain to extra deep floor sink. E) 208/60/3, 55 amp. Motors, controls & electric tank heat. F) 208/60/3, 83.9 amp. Booster heater
Accessories:	A) Electric tank heat. B) Left to right operation as per plan. C) Stainless steel finish. D) Single point electrical connection. E) Table limit switch.
Installation Instructions:	A) Set and level as per plan. B) Attach dish tables as required.

ITEM #K-55	STAINLESS STEEL VENT HOOD: TYPE II
Quantity:	(1) each
Manufacturer:	Captiveaire
Model Number:	#4830 ND-2
Dimensions:	6’-6”W x 3’-6”D x 2’-6”H
Utility Requirements:	A) Total exhaust of 1050 CFM with (1) 12”D duct collar at 0.129” W.C. SP and 1337 duct velocity. B) Total make-up air of 840 CFM to be provided to the space by the mechanical system.
Accessories:	A) Stainless steel enclosure panels to ceiling and trim to wall.
Installation Instructions:	A) Mount from structure above at +6’-9” a.f.f. to the bottom of the hood, as per plan. (253 lb.) B) To be provided and installed by the Food Service Equipment Contractor. C) General Contractor to provide structural reinforcement and support as required.

ITEM #K-56 STAINLESS STEEL WALL FLASHING

Quantity: (1) lot
Manufacturer: Custom Metal Fabricated
Model Number: Custom, as per plans and details.
Dimensions: 5’-3” x 19’-1” x 3’-0” x to Ceiling.
Utility Requirements: None
Accessories:
A) Stainless steel wall flashing on dish washer wall from right side wall, half way across back wall of dishwashing assembly and left side wall return from floor base to ceiling.
B) Provide stainless steel “J” and “T” trim at seams and at top edge.
Installation Instructions:
A) Mount to wall as required.

ITEM #K-57 SPARE NUMBER

ITEM #K-58 STAINLESS STEEL CLEAN DISH TABLE

Quantity: (1) each
Manufacturer: Custom Metal Fabricated.
Model Number: Custom, as per plans and details.
Dimensions: 7’-8”W x 2’-6”D x 34”H
Utility Requirements: None
Accessories:
A) 8” back splash.
B) Provide 4’-0”W under shelf as per plan.
Installation Instructions:
A) Set and level as per plan.
B) Clip and seal back splash to wall.
C) Verify entry requirements of dishwasher. Gently slope table back to dishwasher.

ITEM #K-59 STAINLESS STEEL WALL SHELF

Quantity: (1) each
Manufacturer: Custom Metal Fabricated
Model Number: Custom, as per plans and details.
Dimensions: 5’-10”W x 1’-2”D
Utility Requirements: None
Accessories:
A) Provide with (2) mounting brackets.
Installation Instructions:
A) Mount to wall at +62” A.F.F. as per plan.
B) General Contractor to provide blocking in wall as required.

ITEM #K-60 SPARE NUMBER

ITEM #K-61	CONVEYOR OVEN: STACKED
Quantity:	(2) each
Manufacturer:	TurboChef
Model Number:	Hhc-2020
Dimensions:	60”W x 36”D x 30”H
Utility Requirements:	A) 208/60/3, 40 each.
Accessories:	A) Stand with heavy-duty casters. B) Left to right operation. C) 50/50 Split belt on upper oven. D) Provide stacked ovens. E) Cord and plug.
Installation Instructions:	A) Set in place on Utility Counter, item #K-63, as per plan.

ITEM #K-62	STAINLESS STEEL VENT HOOD: TYPE II
Quantity:	(1) each
Manufacturer:	Captiveaire
Model Number:	#5430 VHB-G-REM1
Dimensions:	6’-0”W x 4’-6”D x 2’-6”H
Utility Requirements:	A) Total exhaust of 900 CFM with (1) 12”D duct collar at 0.105” W.C. SP and 1146 duct velocity. B) Total make-up air of 720 CFM to be provided to the space by the mechanical system.
Accessories:	A) Stainless steel enclosure panels to ceiling and trim to wall. B) Provide with stainless steel wall flashing wall behind hood from floor base to underside of hood. Provide stainless steel “J” and “T” trim at seams and at top edge.
Installation Instructions:	A) Mount from structure above at +6’-9” a.f.f. to the bottom of the hood, as per plan. (251 lb.) B) To be provided and installed by the Food Service Equipment Contractor. C) General Contractor to provide structural reinforcement and support as required.

ITEM #K-63	STAINLESS STEEL UTILITY COUNTER
Quantity:	(1) each
Manufacturer:	Custom Metal Fabricated
Model Number:	Custom, as per plans and details.
Dimensions:	8’-0”W x 36”D x 36”H and 28”H
Utility Requirements:	None.
Accessories:	A) 8” back splash from +36”af.f. B) Finished sides and cabinet base. C) Provide 30”W x 36”H counter with bottom shelf and (1) drawer centered on left side and 66”W x 28”H counter with bottom shelf at right side.
Installation Instructions:	A) Set and level as per plan. B) Clip and seal back splash to wall.

ITEM #K-64	STAINLESS STEEL WALL SHELF
Quantity:	(1) each
Manufacturer:	Custom Metal Fabricated
Model Number:	Custom, as per plans and details.
Dimensions:	30'W x 1'-2"D.
Utility Requirements:	None
Accessories:	A) Provide with (2) mounting brackets.
Installation Instructions:	A) Mount to wall at +62" A.F.F. as per plan. B) General Contractor to provide blocking in wall as required.

ITEM #K-65	REACH-IN REFRIGERATOR: DOUBLE SECTION
Quantity:	(1) each
Manufacturer:	True
Model Number:	#STR2R-2S-HC
Dimensions:	53"W x 35"D x 85"H
Utility Requirements:	A) 115/60/1, 5.9 amp.
Accessories:	A) Self-contained air-cooled refrigeration. B) Finished sides. C) Door lock. D) Set of heavy-duty locking casters. E) Hinge doors as per plan. F) Kit #3 Universal Tray slides on top section and Kit #4 Chrome shelves on lower section.
Installation Instructions:	A) Set in place as per plan.

ITEM #K-66	PASS-THROUGH REFRIGERATOR: DOUBLE SECTION
Quantity:	(2) each
Manufacturer:	True
Model Number:	#STR2RPT-2S-2S-HC
Dimensions:	53"W x 40"D x 85"H
Utility Requirements:	A) 115/60/1, 5.9 amp.
Accessories:	A) Self contained, air-cooled refrigeration. B) Finished sides. C) Door lock. D) Set of heavy-duty locking casters. E) Hinge doors as per plan. F) Kit #3 Universal Tray slides on top section and Kit #4 Chrome shelves on lower section.
Installation Instructions:	A) Set in place as per plan.

ITEM #K-67	PASS-THROUGH HOT FOOD WARMING CABINET: DOUBLE SECTION
Quantity:	(2) each
Manufacturer:	True
Model Number:	#STR2HPT-2S-2S
Dimensions:	53”W x 40”D x 84”H
Utility Requirements:	A) 208/60/1, 3,000 Watt.
Accessories:	A) Stainless steel doors. B) Finished sides. C) Door lock. D) Set of heavy-duty locking casters. E) Cord and plug. F) Kit #3 Universal Tray slides on top section and Kit #4 Chrome shelves on lower section.
Installation Instructions:	A) Set in place as per plans.

ITEM #K-68	REFRIGERATED FOOD PREP TABLE
Quantity:	(2) each
Manufacturer:	True
Model Number:	#TSSU-48-18M-B-HC
Dimensions:	49”W x 34”D x 36”H (47”H Cover)
Utility Requirements:	A) 115/60/1, 5.8 amp.
Accessories:	A) Stainless steel finish. B) Self contained, air cooled refrigeration. C) (18) 1/6 pan insert top configuration. D) Set of heavy-duty locking casters.
Installation Instructions:	A) Set in place as per plan.

ITEM #K-69	STAINLESS STEEL UTILITY COUNTER with UTILITY SINK
Quantity:	(1) each
Manufacturer:	Custom Metal Fabricated
Model Number:	Custom, as per plans and details.
Dimensions:	7’-0”W x 32”D x 36”H
Utility Requirements:	None.
Accessories:	A) 8” back splash. B) Stainless steel bottom shelf. C) Utility sink welded into top center with 4” O.C. splash mounted 1/4 turn faucet and drain. D) Stainless steel apron mounted in front of utility sink. E) Finished sides and cabinet base. F) Provide (2) drawers mounted at each side
Installation Instructions:	A) Set and level as per plan. B) Clip and seal back splash to wall.

ITEM #K-70	STAINLESS STEEL WALL SHELF
Quantity:	(1) each
Manufacturer:	Custom Metal Fabricated
Model Number:	Custom, as per plans and details.
Dimensions:	7’-0”W x 1’-2”D.
Utility Requirements:	None
Accessories:	A) Provide with (4) mounting brackets.
Installation Instructions:	A) Mount to wall at +62” A.F.F. as per plan. B) General Contractor to provide blocking in wall as required.

ITEM #K-71	STAINLESS STEEL WALL SHELF
Quantity:	(2) each
Manufacturer:	Custom Metal Fabricated
Model Number:	Custom, as per plans and details.
Dimensions:	52”W x 1’-2”D.
Utility Requirements:	None
Accessories:	A) Provide with (2) mounting brackets.
Installation Instructions:	A) Mount to wall at +62” A.F.F. as per plan. B) General Contractor to provide blocking in wall as required.

ITEM #K-72	REACH-IN REFRIGERATOR: DOUBLE SECTION
Quantity:	(1) each
Manufacturer:	True
Model Number:	#STR2R-2S-HC
Dimensions:	53”W x 35”D x 85”H
Utility Requirements:	A) 115/60/1, 5.9 amps.
Accessories:	A) Self-contained, air-cooled refrigeration. B) Finished sides. C) Door lock. D) Set of heavy-duty locking casters. E) Hinge doors as per plan. F) Kit #3 Universal Tray slides on top section and Kit #4 Chrome shelves on lower section.
Installation Instructions:	A) Set in place as per plan.

ITEM #K-73	STAINLESS STEEL UTILITY COUNTER with UTILITY SINK
Quantity:	(1) each
Manufacturer:	Custom Metal Fabricated
Model Number:	Custom, as per plans and details.
Dimensions:	5’-0”W x 32”D x 36”H
Utility Requirements:	None.
Accessories:	A) 8” back and side splash. B) Stainless steel bottom shelf. C) Utility sink welded into top right side with faucet and drain. D) Stainless steel apron mounted in front of utility sink. E) Finished sides and cabinet base. F) Provide (1) drawers mounted at left side
Installation Instructions:	A) Set and level as per plan. B) Clip and seal back splash to wall.

ITEM #K-74	STAINLESS STEEL WALL SHELF
Quantity:	(1) each
Manufacturer:	Custom Metal Fabricated
Model Number:	Custom, as per plans and details.
Dimensions:	5’-0”W x 1’-2”D.
Utility Requirements:	None
Accessories:	A) Provide with (2) mounting brackets.
Installation Instructions:	A) Mount to wall at +62” A.F.F. as per plan. (Clear oven below on counter) B) General Contractor to provide blocking in wall as required.

ITEM #K-75	TURBO OVEN
Quantity:	(1) each
Manufacturer:	Turbo Chef
Model #:	#I-3
Dimensions:	24”W x 32”D x 22”H
Utilities Requirements	A) 208/60/1, 40 amp.
Accessories:	A) Standard features.
Installation Instructions:	A) Set onto Utility Counter, item #K-73, as per plan.

ITEM #K-76	PIZZA STAINLESS STEEL SERVICE COUNTER
Quantity:	(1) each
Manufacturer:	Custom Metal Fabricated
Model Number:	Custom, as per plans and details.
Dimensions:	14’-1” x 10’-8” “L” x 3’-6”D x 2’-10”H. Verify with field measurements.
Utility Requirements:	None
Accessories:	A) Stainless steel top as per plans and details. B) Stainless steel adjustable bullet feet on steel frame as per details. C) Stainless steel bottom shelf as per details. D) Stainless steel apron as per details. E) 4”H x 1”D stainless steel side splash to side walls and bulkheads as per details. F) Set and level counter top as required on front half wall provided by General Contractor. G) Stainless steel base plate attached to feet at back of counter as per details. H) Provide holes with grommet covers, through counter top for cord and plugs as required
Installation Instructions:	A) Set and level as per plan. B) Clip and seal side splash to wall. C) Build in items #K-78, as per plan. D) Build on item #K-77, as per plan.

ITEM #K-77 SELF SERVICE ADJUSTABLE BREATH PROTECTOR

Quantity: (1) each
Manufacturer: BSI
Model Number: ZGuard #ZG9500
Dimensions: 9'-0"W x 1'-11"H. Verify with field measurements.
Utility Requirements: None
Accessories:
A) Two section three dimension adjustable self serve food shields with stainless steel finish at pizza thermal shelf, as per plans and details.
B) Stainless steel below counter heavy-duty flange supports mounted through counter top to base counter structure.
Installation Instructions:
A) Build onto Pizza Service Counter, item #K-76.

ITEM #K-78 DROP-IN THERMAL SHELF

Quantity: (2) each
Manufacturer: Hatco
Model #: #GRSBF-48-S
Dimensions: 49"W x 25"D x 3"H
Utility Requirements:
A) 120/60/1, 10.2 amp.
Accessories:
A) Mount controls to back apron of Pizza Service Counter, item #K-76.
Installation Instructions:
A) Build into Pizza Service Counter, item #K-76 as per plan.

ITEM #K-79 SPARE NUMBER

ITEM #K-80 SPARE NUMBER

ITEM #K-81 ENTRÉE STAINLESS STEEL SERVICE COUNTER

Quantity: (1) each
Manufacturer: Custom Metal Fabricated
Model Number: Custom, as per plans and details.
Dimensions: 9'-6"W x 3'-6"D x 2'-10"H. Verify with field measurements.
Utility Requirements: None
Accessories:
A) Stainless steel top as per plans and details.
B) Stainless steel adjustable bullet feet on steel frame as per details.
C) Stainless steel bottom shelf as per details.
D) Stainless steel apron as per details.
E) 4"H x 1"D stainless steel side splash to side walls and bulkheads as per details.
F) Set and level counter top as required on front half wall provided by General Contractor.
G) Stainless steel base plate attached to feet at back of counter as per details.
H) Provide holes with grommet covers, through counter top for cord and plugs as required
Installation Instructions:
A) Set and level as per plan.
B) Clip and seal side splash to wall.
C) Build in items #K-83 and #K-84, as per plan.
D) Build on item #K-82, as per plan.

ITEM #K-82	SELF SERVICE ADJUSTABLE BREATH PROTECTOR
Quantity:	(1) each
Manufacturer:	BSI
Model Number:	ZGuard #ZG9500
Dimensions:	8’-2”W x 1’-11”H. Verify with field measurements.
Utility Requirements:	None
Accessories:	A) Two section three dimension adjustable self serve food shields with stainless steel finish at drop-in cold pan and hot food warmer, as per plans and details. B) Stainless steel below counter heavy-duty flange supports mounted through counter top to base counter structure.
Installation Instructions:	A) Build onto Entrée Service Counter, item #K-81.

ITEM #K-83	DROP-IN MECHANICALLY REFRIGERATED COLD PAN
Quantity:	(1) each
Manufacturer:	Hatco
Model Number:	#CWB-3
Dimensions:	45”W x 27”D x 12”H, (26”H to Refrigeration.)
Utility Requirements:	A) 120/60/1, 3.8 amp. B) 1” Indirect drain to floor sink.
Accessories:	A) Self contained, air-cooled refrigeration. B) (3) Full size hotel pan capacity. C) Provide ventilation at base of serving counter, as required. D) Provide with cord and plug with switch connected to outlet.
Installation Instructions:	A) Build into Entrée Serving Counter, item #K-81, as per plan. B) Mount switch to back apron of serving counter.

ITEM #K-84	DROP-IN HOT FOOD WARMER
Quantity:	(1) each
Manufacturer:	Hatco
Model Number:	#HWBI-3D
Dimensions:	44”W x 24”D x 11”H
Utility Requirements:	A) 208/60/1, 17.4 amp. B) 1” Indirect drain to floor sink. B) 3/8” Hot water.
Accessories:	A) Drain manifold with lever operated drain valve at each compartment. B) Individual thermostat controls. C) Wet or dry operation per compartment. D) Swivel hot water fill faucet. E) (3) compartments.
Installation Instructions:	A) Build into Entrée Serving Counter, item #K-81, as per plan. B) Mount controls to back apron of Serving Counter.

ITEM #K-85	ALA CART STAINLESS STEEL SERVICE COUNTER
Quantity:	(1) each
Manufacturer:	Custom Metal Fabricated
Model Number:	Custom, as per plans and details.
Dimensions:	15’-6”W x 3’-6”D x 2’-10”H. Verify with field measurements.
Utility Requirements:	None
Accessories:	A) Stainless steel top as per plans and details. B) Stainless steel adjustable bullet feet on steel frame as per details. C) Stainless steel bottom shelf as per details. D) Stainless steel apron as per details. E) 4”H x 1”D stainless steel side splash to side walls and bulkheads as per details. F) Set and level counter top as required on front half wall provided by General Contractor. G) Stainless steel base plate attached to feet at back of counter as per details. H) Provide holes with grommet covers, through counter top for cord and plugs as required
Installation Instructions:	A) Set and level as per plan. B) Clip and seal side splash to wall. C) Build in items #K-87 and #88, as per plan. D) Build on item #K-86, as per plan.

ITEM #K-86	SELF SERVICE ADJUSTABLE BREATH PROTECTOR
Quantity:	(1) each
Manufacturer:	BSI
Model Number:	XGuard #XG9500
Dimensions:	15’-0”W x 1’-11”H. Verify with field measurements.
Utility Requirements:	None
Accessories:	A) Five section three dimension adjustable self serve food shields with stainless steel finish at drop-in cold pans and hot food warmer, and two section three dimension adjustable non-self serve full cover food shields with stainless steel finish at two induction stations, as per plans and details. B) Stainless steel below counter heavy-duty flange supports mounted through counter top to base counter structure.
Installation Instructions:	A) Build onto Ala Cart Service Counter, item #K-85.

ITEM #K-87	DROP-IN HOT FOOD WARMER
Quantity:	(1) each
Manufacturer:	Hatco
Model Number:	#HWBI-2D
Dimensions:	30”W x 24”D x 11”H
Utility Requirements:	A) 208/60/1, 11.6 amp. B) 1” Indirect drain to floor sink. C) 3/8” Hot water.
Accessories:	A) Drain manifold with lever operated drain valve at each compartment. B) Individual thermostat controls. C) Wet or dry operation per compartment. D) Swivel hot water fill faucet. E) (2) compartments.
Installation Instructions:	A) Build into Ala Cart Serving Counter, item #K-85, as per plan. B) Mount controls to back apron of Serving Counter.

ITEM #K-88	DROP-IN MECHANICALLY REFRIGERATED COLD PAN
Quantity:	(2) each
Manufacturer:	Hatco
Model Number:	#CWB-2
Dimensions:	32”W x 2”D x 12”H, (26”H to Refrigeration.)
Utility Requirements:	A) 120/60/1, 3.8 amp. B) 1” Indirect drain to floor sink.
Accessories:	A) Self-contained air-cooled refrigeration. B) (2) Full size hotel pan capacity. C) Provide ventilation at base of serving counter, as required. D) Provide with cord and plug with switch connected to outlet.
Installation Instructions:	A) Build into Ala Cart Serving Counter, item #K-85, as per plan. B) Mount switch to back apron of serving counter.

ITEM #K-89	COUNTER TOP INDUCTION COOK TOP
Quantity:	(4) each
Manufacturer:	Cook Tek
Model Number:	#MC1800
Dimensions:	14”W x 14”D x 10”H
Utility Requirements:	A) 120/60/1, 1,800 Watt.
Accessories:	A) Standard Features.
Installation Instructions:	A) Set onto Ala Cart Serving Counter, item #K-85, as per plan.

ITEM #K-90	FIRE PROTECTION SYSTEM
Quantity:	(1) lot
Manufacturer:	Ansul
Model Number:	#R-102
Dimensions:	-
Utility Requirements:	-
Accessories:	A) Provide gas shut off valve and five electrical shut off contacts as required for protected equipment, for installation by mechanical and electrical contractors.
Installation Instructions:	A) Provide a complete self-contained and certified system. B) To protect Exhaust Hood, item #K-91. Tanks to be located in exhaust hood utility cabinet. C) Al conduits and piping to be concealed in walls and ceiling. Exposed piping in hood to be chrome. D) Verify placement of emergency pull station with architect.

ITEM #K-91	STAINLESS STEEL EXHAUST HOOD
Quantity:	(1) each
Manufacturer:	Captiveaire
Model Number:	#5430 VHB-G-REM1
Dimensions:	10’-0”W x 4’-6”D x 2’-6”H
Utility Requirements:	A) 120/60/1, 450 Watt. B) Total exhaust 2500 CFM with (2) 12”D duct collars at 1250 cfm at 0.639” W.C. SP and 1592 duct velocity.. C) Total make-up air 2000 CFM to be provided by mechanical system to area.
Accessories:	A) Vapor proof incandescent light fixtures. B) Stainless steel enclosure panels from hood to ceiling.
Installation Instructions:	A) Mount from structure above as per plan. (803) lb. B) Mechanical Contractor to connect exhaust ducts to duct collars.

ITEM #K-92	REFRIGERATED FOOD PREP TABLE
Quantity:	(1) each
Manufacturer:	True
Model Number:	#TSSU-48-18M-B-ADA-HC
Dimensions:	49”W x 34”D x 34”H (45”H Cover)
Utility Requirements:	A) 115/60/1, 5.8 amp.
Accessories:	A) Stainless steel finish. B) Self contained, air cooled refrigeration. C) (18) 1/6 pan insert top configuration. D) Set of heavy-duty locking casters.
Installation Instructions:	A) Set in place in Deli Service Counter, item #K-107, as per plan.

ITEM #K-93	SPECIALTY STAINLESS STEEL SERVICE COUNTER
Quantity:	(1) each
Manufacturer:	Custom Metal Fabricated
Model Number:	Custom, as per plans and details.
Dimensions:	9’-6”W x 3’-6”D x 2’-10”H. Verify with field measurements.
Utility Requirements:	None
Accessories:	A) Stainless steel top as per plans and details. B) Stainless steel adjustable bullet feet on steel frame as per details. C) Stainless steel bottom shelf as per details. D) Stainless steel apron as per details. E) 4”H x 1”D stainless steel side splash to side walls and bulkheads as per details. F) Set and level counter top as required on front half wall provided by General Contractor. G) Stainless steel base plate attached to feet at back of counter as per details. H) Provide holes with grommet covers, through counter top for cord and plugs as required
Installation Instructions:	A) Set and level as per plan. B) Clip and seal side splash to wall. C) Build in items #K-95 and #K-96, as per plan. D) Build on item #K-94, as per plan.

ITEM #K-94	SELF SERVICE ADJUSTABLE BREATH PROTECTOR
Quantity:	(1) each
Manufacturer:	BSI
Model Number:	ZGuard #ZG9500
Dimensions:	8’-2”W x 1’-11”H. Verify with field measurements.
Utility Requirements:	None
Accessories:	A) Two section three dimension adjustable self serve food shields with stainless steel finish at drop-in cold pan and hot food warmer, as per plans and details. B) Stainless steel below counter heavy-duty flange supports mounted through counter top to base counter structure.
Installation Instructions:	A) Build onto Specialty Service Counter, item #K-93.

ITEM #K-95	DROP-IN MECHANICALLY REFRIGERATED COLD PAN
Quantity:	(1) each
Manufacturer:	Hatco
Model Number:	#CW-3
Dimensions:	45”W x 27”D x 12”H, (26”H to Refrigeration.)
Utility Requirements:	A) 120/60/1, 3.8 amp. B) 1” Indirect drain to floor sink.
Accessories:	A) Self contained, air-cooled refrigeration. B) (3) Full size hotel pan capacity. C) Provide ventilation at base of serving counter, as required. D) Provide with cord and plug with switch connected to outlet.
Installation Instructions:	A) Build into Specialty Serving Counter, item #K-93, as per plan. B) Mount switch to back apron of serving counter.

ITEM #K-96	DROP-IN HOT FOOD WARMER
Quantity:	(1) each
Manufacturer:	Hatco
Model Number:	#HWBI-3D
Dimensions:	44”W x 24”D x 11”H
Utility Requirements:	A) 208/60/1, 17.4 amp. B) 1” Indirect drain to floor sink. C) 3/8” Hot water.
Accessories:	A) Drain manifold with lever operated drain valve at each compartment. B) Individual thermostat controls. C) Wet or dry operation per compartment. D) Swivel hot water fill faucet. E) (3) compartments.
Installation Instructions:	A) Build into Specialty Serving Counter, item #K-93, as per plan. B) Mount controls to back apron of Serving Counter.

ITEM #K-97	DELI STAINLESS STEEL SERVICE COUNTER
Quantity:	(1) each
Manufacturer:	Custom Metal Fabricated
Model Number:	Custom, as per plans and details.
Dimensions:	10’-8” x 14’-1”W x 3’-6”D x 2’-10”H. Verify with field measurements.
Utility Requirements:	None
Accessories:	A) Stainless steel top as per plans and details. B) Stainless steel adjustable bullet feet on steel frame as per details. C) Stainless steel bottom shelf as per details. D) Stainless steel apron as per details. E) 4”H x 1”D stainless steel side splash to side walls and bulkheads as per details. F) Set and level counter top as required on front half wall provided by General Contractor. G) Stainless steel base plate attached to feet at back of counter as per details. H) Provide holes with grommet covers, through counter top for cord and plugs as required. I) Provide opening to install refrigerated prep table, item #K-92 as per plans.
Installation Instructions:	A) Set and level as per plan. B) Clip and seal side splash to wall. C) Build in items #K-99 and #K-100, as per plan. D) Build on item #K-98, as per plan.

ITEM #K-98	SELF SERVICE ADJUSTABLE BREATH PROTECTOR
Quantity:	(1) each
Manufacturer:	BSI
Model Number:	XGuard #XG9500
Dimensions:	9’-3”W x 1’-11”H. Verify with field measurements.
Utility Requirements:	None
Accessories:	A) Two section three dimension adjustable self serve food shields with stainless steel finish at drop-in cold pan and hot food warmer, and one section three dimension adjustable non-self serve full cover food shields with stainless steel finish at refrigerated food prep table, as per plans and details. B) Stainless steel below counter heavy-duty flange supports mounted through counter top to base counter structure.
Installation Instructions:	A) Build onto Deli Service Counter, item #K-97.

ITEM #K-99	DROP-IN HOT FOOD WARMER
Quantity:	(1) each
Manufacturer:	Hatco
Model Number:	#HWBI-3D
Dimensions:	44”W x 24”D x 11”H
Utility Requirements:	A) 208/60/1, 17.4 amp. B) 1” Indirect drain to floor sink. C) 3/8” Hot water.
Accessories:	A) Drain manifold with lever operated drain valve at each compartment. B) Individual thermostat controls. C) Wet or dry operation per compartment. D) Swivel hot water fill faucet. E) (3) compartments.
Installation Instructions:	A) Build into Deli Serving Counter, item #K-97, as per plan. B) Mount controls to back apron of Serving Counter.

ITEM #K-100	DROP-IN MECHANICALLY REFRIGERATED COLD PAN
Quantity:	(1) each
Manufacturer:	Hatco
Model Number:	#CWB-4
Dimensions:	58”W x 27”D x 12”H, (26”H to Refrigeration.)
Utility Requirements:	A) 120/60/1, 5.9 amp. B) 1” Indirect drain to floor sink.
Accessories:	A) Self-contained air-cooled refrigeration. B) (4) Full size hotel pan capacity. C) Provide ventilation at base of serving counter, as required. D) Provide with cord and plug with switch connected to outlet.
Installation Instructions:	A) Build into Deli Serving Counter, item #K-97, as per plan. B) Mount switch to back apron of serving counter.

ITEM #K-101	HEATED SANDWICH SLIDE CABINET
Quantity:	(1) each
Manufacturer:	Hatco
Model #:	#GRHD-3PD
Dimensions:	46”W x 27”D x 32”H
Utility Requirements:	A) 120/60/1, 1755 Watts.
Accessories:	A) Stainless steel finish. B) Flip up self service doors on front. C) Dual shelf. B) Stainless steel finish. C) Cord and plug. D) Sandwich chutes. E) Access from back, not self service.
Installation Instructions:	A) Set on Pizza Service Counter, item #K-76, as per plan.

ITEM #K-102	SPARE NUMBER

ITEM #K-103	JANITOR SINK: PROVIDED BY PLUMBING SECTION
Quantity:	(1) each

ITEM #K-104	JANITOR SHELVING
Quantity:	(1) lot
Manufacturer:	Inter Metro
Model Number:	MetroMax i
Dimensions:	(1) 60”W x 24”D x 86”H (1) 42”W x 24”D x 86”H
Utility Requirements:	None
Accessories:	A) Lot to include: (4) #MX2460G shelves (4) #MX2442G shelves (8) #MX86P posts
Installation Instructions:	A) Assemble, set and level as per plan. (Verify actual field dimensions for compliance.)

ITEM #K-105	STAINLESS STEEL CONDIMENT TABLE: MOBILE
Quantity:	(2) each
Manufacturer:	Custom Metal Fabricated
Model Number:	Custom, as per plans and details.
Dimensions:	72”W x 30”D x 34”H
Utility Requirements:	None
Accessories:	A) Stainless steel finish all sides. Stainless steel panel cabinet doors with locks on one long side. B) Stainless steel top. C) Heavy duty casters with locks.
Installation Instructions:	A) Set in place as per plan.

ITEM #K-106	MILK COOLER
Quantity:	(2) each
Manufacturer:	Beverage Air
Model #:	#STF58
Dimensions:	58”W x 35”D x 48”H
Utility Requirements:	A) 120/60/1, 10.1 amps.
Accessories:	A) Provide with set of casters, two with brakes. B) Lid Locking device. C) Cord and plug. D) 16 case capacity. E) Dual access, forced air. F) Stainless steel interior and exterior.
Installation Instructions:	A) Set in place as per plan

ITEM #K-107	PORTABLE SALAD BAR CART
Quantity:	(2) each
Manufacturer:	Cambro
Model #:	#VBR5
Dimensions:	69”W x 43”D x 63”H
Utility Requirements:	None
Accessories:	A) Set of 6” casters. B) Fold down tray rails #VBRR5. C) Fold down sneeze guard. D) Verify color selection with architect.
Installation Instructions:	A) Assemble and set in place as per plan.

ITEM #K-108	STAINLESS STEEL CASH REGISTER STAND: MOBILE
Quantity:	(2) each
Manufacturer:	Custom Metal Fabricated
Model Number:	Custom, as per plans and details.
Dimensions:	54”W x 27”D and 48”D at side tray slides x 34”H
Utility Requirements:	None
Accessories:	A) Finished all sides. B) Provide with open base at user side. C) Stainless steel top. D) Heavy duty casters with locks. E) Provide grommet through top for computer cables and cords. F) Decorative stainless steel panels on face as per details.
Installation Instructions:	A) Set in place as per plan.

ITEM #E-1	POS CASH REGISTER COMPUTER SYSTEM: PROVIDED BY OWNER
Quantity:	(3) each

ITEM #E-2	POS BASE COMPUTER SYSTEM: PROVIDED BY OWNER
Quantity:	(1) each

END OF SECTION

SECTION 11 5300

LABORATORY EQUIPMENT

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Furnish all labor, materials, equipment, tools and services required to fully complete all Laboratory Equipment work as is indicated on the drawings and/or specified herein including, but not limited to, the following described items.
B. Safety Storage Cabinets.
   1. Acid/Corrosives cabinet - (1) required.
C. Goggle Sanitizer Cabinet.
   1. Locations: Science rooms - (4) required.
D. Do not include sales tax, refer to Section 00 0104 - Notice to Contractors.

1.02 RELATED REQUIREMENTS

A. Division 22 - Plumbing: Plumbing connections.
B. Division 23 - HVAC: Ducting and connections.
C. Division 26 - Electrical: Electrical connections.

1.03 REFERENCE STANDARDS

A. AMCA 99 - Standards Handbook; 2010.
B. AMCA 511 - Certified Ratings Program for Air Control Devices; 2010.
C. ASHRAE Std 110 - Method of Testing Performance of Laboratory Fume Hoods; 1995.
D. ASTM C1036 - Standard Specification for Flat Glass; 2006.
E. NEMA MG 1 - Motors and Generators; 2009, Revision 1 - 2010.
F. NFPA 30 - Flammable and Combustible Liquids Code; 2008.
G. UL (EAUED) - Electrical Appliance and Utilization Equipment Directory; current edition.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Large Components: Ensure that large components can be moved into final position without damage to other construction.
B. Preinstallation Meeting: Convene one week before starting work of this section.
C. Coordinate the work of the Section with the schedule and other requirements of other work being performed in the area at the same time both with regard to mechanical and electrical connections to and in the fume hoods and the general construction work.

1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide equipment dimensions and construction, equipment capacities, physical dimensions, utility and service requirements and locations. Provide data indicating compliance with ASHRAE Standard 110.1995.
C. Shop Drawings: Indicate equipment locations, large scale plans, elevations, cross sections, service run spaces, location and type of service fittings, and clearances required.
   1. Coordinate shop drawings with other work involved.
   2. Provide roughing-in drawings for mechanical and electrical services when required.
   3. Provide face opening, air volume, and static pressure drop data.
D. Samples: Submit two samples, 6 inches by 6 inches (150 mm by 150 mm) of each indicating color, texture, and pattern

E. Manufacturer's Installation Instructions: Indicate special installation requirements.
F. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
G. Operation Data: Include description of equipment operation and required adjusting and testing.
H. Maintenance Data: Identify system maintenance requirements, servicing cycles, lubrication types required and local spare part sources.
I. Project Record Documents: Record actual locations of concealed utility connections.
J. Warranty: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

1.06 QUALITY ASSURANCE

A. Manufacturer: Company specializing in manufacturing the types of products specified in this section, with minimum five years of documented experience.

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.
C. Provide five year manufacturer warranty for fume hoods and safety cabinets.

PART 2 PRODUCTS

2.01 SAFETY STORAGE CABINETS

A. Manufacturers:
   1. Lyon Workspace Products: www.lyonworkspace.com.
   2. Edsal Manufacturing Co: www.edsal.com.
   3. Justrite Manufacturing Co: www.justritemfg.com.
   4. Substitutions: See Section 01 6000 - Product Requirements.
B. Acid/Corrosives Cabinet: Double-wall, 18 gauge welded steel construction with 1 1/2 inch (38 mm) of insulating space between walls. Conforming to NFPA Fire Code No. 30 and OSHA standards.
   1. Size: 43 inches (1092 mm) wide x 18 inches (457 mm) deep x 65 inches (1651 mm) high - 45 gallon.
   2. Adjustable Shelves: (2) - Flanged, galvanized steel shelves with replaceable, leakproof, 2 inch (50 mm) polyethylene trays. Load capacity of 225 lbs (102 kg) per shelf.
   3. Doors: Self-closing doors with fusible link that melts when ambient temperature reaches 160 degrees, releasing the latch holding the door open and three-point latching system with key lock.
   4. Screened flame arrester vents on both sides of cabinets threaded to accept 2 inch (50 mm) external exhaust pipes.
   5. Ground wire connection.
   6. Color: Blue.
   7. Product: Model 5545 manufactured by Lyon Workspace Products.

2.02 GOGGLE SANITIZER CABINET

A. Basis of Design Manufacturer: Carolina; www.carolina.com .
B. Goggle Sanitizer Cabinet:
   1. Cabinet Includes: 25-W, long-life ultraviolet (UV-C) bulb, key lock, safety door switches, and a pilot hole.
   2. Dimensions: 6 inches W x 29 inches H x 10-3/20 inches D.
   3. Power: 120v AC.

PART 3 EXECUTION

3.01 EXAMINATION

3.02 INSTALLATION

A. Install in accordance with manufacturer's instructions.

3.03 ADJUSTING AND CLEANING

3.04 PROTECTION

A. Provide reasonable protective measures to prevent casework and equipment from being exposed to other construction activity.
B. Advise owner and/or his representative of procedures and precautions for protection of material, installed laboratory casework and fixtures from damage by work of other trades.

END OF SECTION 11 5300

This page intentionally left blank

SECTION 11 5413

KILNS

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Furnish all labor, materials, equipment, tools and services required to fully complete all Kiln work as is indicated on the drawings and/or specified herein including, but not limited to, the following described items.
B. Electric kilns.
   1. Downdraft ventilation system.
   2. Owner Furnished Contractor Installed.
C. Do not include sales tax, refer to Section 00 1115 - Advertisement for Prequalification of Bidders

1.02 RELATED SECTIONS

A. Division 26 - Electrical Power Conductors and Cables: Services and connections to kilns and ventilation systems.

1.03 REFERENCE STANDARDS

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Owner Furnished Product:
   1. Model MAS2323HE by Olympic Kiln.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine substrates, areas, and conditions where kilns, ventilation systems, and accessories, for compliance with requirements that affect installation and with requirements for installation tolerances. Notify the Architect in writing of conditions detrimental to proper completion of the work. Do not proceed with work until unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Downdraft Ventilation System:
   1. Ensure that kiln stand is a minimum of eight (8) inches high. If stand is lower than eight (8) inches high, either shim legs to increase distance from floor to eight (8) inches or replace stand with one (1) that is eight (8) inches high.
   2. If kiln does not have factory drilled holes, provide number, size of holes as recommended by the manufacturer for the specific kiln model. Locate holes in accordance with manufacturer’s recommendations.

3.03 INSTALLATION

A. Install in strict accordance with manufacturer's written installation instructions and recommendations. Coordinate installation with adjacent work to ensure proper clearances.
B. Install units in final locations after finishes have been completed in each area. Verify that clearances are adequate to properly operate equipment.
C. Set units level, plumb, properly aligned, and securely in place.

D. See Division 26 sections for electrical requirements.
E. Downdraft Ventilation System:
    1. Assemble and install system components on kiln in accordance with manufacturer's written instructions.
    2. Install the blower and motor assembly on the wall in a location that is close enough for the flexible aluminum duct to reach the kiln without overstretching the
    3. duct. Where wall-mounting is not possible, mount the vent motor on the floor or above the ceiling.

3.04 CLEANING AND PROTECTION

A. Test kilns, ventilation systems, and accessories to verify proper operation. Make necessary adjustments.
B. Verify that accessories required have been furnished and installed.
C. Remove packing material and leave kilns in clean condition, ready for operation.

END OF SECTION 11 5413

SECTION 11 5700

VOCATIONAL SHOP EQUIPMENT

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Furnish all labor, materials, equipment, tools and services required to fully complete all Vocational Shop Equipment work as is indicated on the drawings and/or specified herein including, but not limited to, the following described items.
B. Safety storage paint cabinets.
   1. Wood Shop - 1 required.
C. Workbench shop lockers located at Wood Shop with hardwood work tops.
   1. Wood Shop - 2 required.
D. Do not include sales tax, refer to Section 00 0104 - Notice to Contractors.

1.02 RELATED REQUIREMENTS

A. Section 04 2731 - Reinforced Unit Masonry: Anchoring substrate.
B. Section 09 2116 - Gypsum Board Assemblies: Anchoring substrate.
C. Division 23 - HVAC: Ducting and connections.

1.03 REFERENCE STANDARDS

A. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2010.
B. NFPA 30 - Flammable and Combustible Liquids Code; 2008.
C. NFPA 70 - National Electrical Code; 2008.

1.04 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.
B. Sequencing: Ensure that utility connections are achieved in an orderly and expeditious manner.
C. Large Components: Ensure that large components can be moved into final position without damage to other construction.

1.05 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. Uniform bench loads.
   2. Details of equipment assemblies, including reinforcement.
   3. Accessories.
   4. Substrate preparation instructions and recommendations.
   5. Storage and handling requirements and recommendations.
   6. Installation methods.
   7. Specimen warranty.
   8. Maintenance methods.
C. Shop Drawings: Indicate location, type, and layout of equipment, including lengths, heights, and relationship to adjacent construction.
   1. Indicate methods of achieving specified anchoring requirements.

D. Selection Samples: For each finish product specified, color chips representing manufacturer's full range of available colors and finishes.
E. Warranty: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

1.06 QUALITY ASSURANCE

A. Manufacturer 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. Inspect for dents, scratches, or other damage. Replace damaged units.
B. Store in manufacturer's unopened packaging until ready for installation.
C. Store under cover and elevated above grade.

1.08 WARRANTY

A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
B. Provide five year manufacturer warranty covering defects of manufacturing and workmanship and rust and corrosion.
C. The Contractor shall guarantee his work for a period of 5 years from date of Substantial Completion. Guarantee shall be on form included in Section 01 7800.

PART 2 PRODUCTS

2.01 GENERAL ANCHORING

A. Seismic Design: Design for Seismic Design Category D requirements, IBC 2009.
B. Anchors: Provide anchoring hardware to secure each unit to floor and wall.
    1. Provide hardware of type recommended by manufacturer for substrate.

2.02 PAINT SAFETY STORAGE CABINETS

A. Manufacturers:
    1. Grainger: www.grainger.com
    2. Lyon Workspace Products: www.lyonworkspace.com.
    3. Edsal Manufacturing Co: www.edsal.com.
    4. Justrite Manufacturing Co: www.justrite.com.
    5. Substitutions: See Section 01 6000 - Product Requirements.
B. Paint Cabinet: Double-wall, 18 gauge welded steel construction with 1 1/2 inch (38 mm) of insulating space between walls. Conforming to NFPA Fire Code No. 30 and OSHA standards.
    1. Size: 23 inches (584 mm) wide by 34 inches (863 mm) deep x 44 inches (1117 mm) high - 40 gallon.
    2. Adjustable Shelves: (2) - Flanged, galvanized steel shelves. Load capacity of 225 lbs (102 kg) per shelf.
    3. Doors: Self-closing doors with fusible link that melts when ambient temperature reaches 160 degrees, releasing the latch holding the door open and three-point latching system with key lock.
    4. Color: Yellow.
    5. Product: Model 19T245 manufactured by Grainger Products.

2.03 WORKBENCHES - SHOP LOCKERS

A. Manufacturers:
    1. Diversified Spaces: www.diversifiedspaces.com

2. Lyon Workspace Products: www.lyonworkspace.com.
3. Tennsco: www.tennsco.com.
4. Shain by Diversified Woodcrafts: www.shainsolutions.com.
5. Substitutions: See Section 01 6000 - Product Requirements.

B. Basis of Design:
1. MA6-12L by Diversified Spaces, www.diversifiedspaces.com.
a. (2) units - each unit includes 22 lockers with solid maple top. Maple top shall be modified to fit the (2) unit length as shown in drawings.
b. Location: Shop F108.
2. Wall Benches:
a. Heavy gauge steel lockers (each 12 inches W by 21 inches D by 15 inches H).
b. Each locker door includes spring hinge, padlock hasp.
c. Bench height varies with thickness at the top.
d. Color: Astro Gray.
3. Bench with 2 1/4 inches Maple Top Height 32 3/4 in.
a. Height 32 3/4 inches.
b. Laminated hard maple top.
c. Seasoned, klin-dried lumber.
d. Laminated strips held by through bolts.
e. Polyurethane finish is split and warp resistant.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that substrate is level and that clearances are as specified.
B. Verify that walls are suitable for equipment attachment.
C. Do not begin installation until substrates have been properly prepared.
D. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.02 INSTALLATION

A. Install in accordance with manufacturer's instructions.
B. Anchor and reinforce as specified and as recommended by manufacturer for seismic requirements.
C. Install bench surfaces level and vertical supports plumb; adjust feet and bases as required.

3.03 CLEANING

A. Clean equipment and surrounding area after installation.

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 11 5700

This page intentionally left blank

SECTION 11 6133

STAGE RIGGING AND EQUIPMENT

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

A. This Section includes the following types of stage equipment.
   1. Winch operated line shaft or packaged self contained hoists.
   2. Feeder cable take-up line.
   3. Pipe battens.

1.03 RELATED SECTIONS:

A. The following Sections contains requirements that relate to this Section:
B. Division 26 Sections for electrical wiring, connections, and installing remote control devices and power wiring and devices supported by equipment specified in this section.
   1. Division 11 Sections for stage curtains and other stage equipment.

1.04 SUBMITTALS

A. General: Submit the following according to Conditions of the Contract and Division 1 Specification Sections, as modified herein.
B. Product data, installation instructions, and general recommendations, including data substantiating that all materials comply with requirements. Submittal drawings shall have been reviewed and approved by an engineer, licensed in the state of Utah, attesting to the compliance with all local codes and requirements.
C. Shop drawings including plans, elevations, and detail sections of typical rigging elements. Show anchors, hardware, operating equipment, and other components not included in manufacturer's standard product data.
D. Installation coordination drawings or reports, demonstrating that installers have examined project drawings, have coordinated with particular requirements of equipment to be provided, and have secured installation labor of qualified personnel. All shall certify that the products as installed, comply with specified requirements.

1.05 QUALITY ASSURANCE

A. Fabricator/Installer Qualifications: Firm experienced in producing stage equipment similar to that indicated for this Project that have a record of successful in-service performance, and with sufficient production and installation capacity to produce and install required units without causing a delay in the Work.

1.06 PROJECT CONDITIONS

A. Field Measurements: Check actual stage batten travel by accurate field measurements before installation; show recorded measurements on final shop drawings. Coordinate fabrication schedule with construction progress to avoid delaying Work.

1. Where field measurements cannot be made without delaying the Work, guarantee travel dimensions and proceed with fabricating stage equipment without field measurements. Coordinate stage construction to ensure that actual operating dimensions correspond to guaranteed dimensions.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by the following:
   1. Rigging Equipment:
      a. J.R. Clancy, Inc. Syracuse, NY.
      b. Stagecraft Industries, Portland, OR.
      c. Protech, Las Vegas, NV.
      d. SECOA, Minneapolis, MN.
      e. ETC, Middleton, WI.
   2. Installation Contractor:
      a. Stagecraft Industries, Portland, OR.
      b. Protech Las Vegas, NV.
      c. SECOA, Minneapolis, MN.
      d. Oasis Stage Werks, Salt Lake City, UT.
      e. GTS, Salt Lake City, UT.

B. The Rigging Contractor shall be the rigging manufacturer or shall have been an authorized representative or dealer of the manufacturer for a minimum of five years. The contractor shall have been involved in installing stage rigging systems for a period of five years or more and shall have completed at least ten installations of this type and scope. The consultant shall be the final judge of the suitability of experience.

C. Other contractors seeking acceptance must submit the following information at least two weeks prior to the bid opening date. Approval of contractors will be by addenda. Failure to submit any of the required information will automatically disqualify the contractor from consideration of approval.
   1. A listing of five equivalent installations including: Name, Address and Telephone Number of Owner Name, Address and Telephone Number of Architect.

2.02 MATERIALS

A. ASTM A 53, Grade A, black iron, standard weight (Schedule 40), 1-1/2-inch nominal inside diameter, unless otherwise indicated. Splice battens segments with internal splice pipe fastened with 4 riveted pins, minimum. Paint pattens flat black, with yellow centerline marker.

B. Galvanized Steel Sheet: Zinc-coated carbon steel sheet of commercial quality, complying with ASTM A 526, G60 zinc coating; 0.075-inch (14-gage) minimum nominal thickness.

C. Alloy and temper recommended by manufacturer for strength and corrosion resistance, mill finish, ASTM B 221 for extrusions.

D. Supports, Clamps, and Anchors: Sheet steel in manufacturer's standard gages, galvanized after fabrication according to ASTM A 153, Class B.

E. Support Chain: ASTM A 413, 1/4-inch size, not less than 0.276-inch material diameter.

F. Inserts, Bolts, and Fasteners: Manufacturer's standard units.

G. Bearings: Permanently lubricated roller bearing type.

H. Steel Cables: All steel cables shall be 7 by 19 stranding galvanized steel aircraft cable, sized as indicated. Use only new cable. Rated breaking strengths shall be as follows:
   1. 1/8 inch diameter 2000 pounds.
   2. 3/16 inch diameter 4200 pounds.
   3. 1/4 inch diameter 7000 pounds.

a. 5/16 inch diameter 9800 pounds.

I. Cable Fittings shall comply with wire rope manufacturer's recommendation for installation criteria. Cable clips shall be dropped forged style, Crosby brand, pressed sleeves shall be Nicopress brand, all cables shall be fastened to hardware by fitted cable thimbles.

J. Trim Chains shall be 30 inches long, with a snap clip at one end. Chain shall be 4/0 gage, passing link style designed for a 500 pound working load. Provide safety bolt, washers and locknut for each trim chain.

K. Motorized Battens: Line shaft assemblies as shown on documents. Fabricate line shafts from from extruded aluminum or formed steel backbone structures with a minimum number of joints. Shop-paint completed pipe battens with good quality black paint with 1-inch-wide yellow stripe at the center of each batten.

L. Ratings: Assemblies shall have a working load rating of 3000 pounds, uniformly distributed, and a fixed operating speed of 20 feet minute. Start and stop shall be dampened to guard against bounce. All hoists shall operate at 277 / 480 volts. Provide an external fused disconnect if not provided internally.

M. Underhung Loft Blocks (for cable pickup or muleing): Loft blocks shall have 8 1/2 inch diameter sheave made of lightweight molded plastic, fully rated for the load. The sheave shall be machine faced and turned with the required size rope and cable grooves. Grooves shall be full depth with sloped sides. All grooves shall comply with cable or rope manufacturer's standards for groove shape, size and tolerance. Sheave shall be fitted with 5/8-inch diameter tapered roller bearing, properly sized for the applied load and speed. The 5/8-inch diameter steel shaft shall have a dutchman to engage a keyhole on the side plate of the block. A fine thread self-locking nut shall be provided on the shaft to allow adjustment of the sheave. The block housing shall have two side plates rigidly fastened together with a minimum three 1/4-inch bolts with spacers. The block shall have a drop forged steel clamp, fastened to the block sides with two 5/16-inch bolts with locknuts, and a 3/4-inch threaded shaft with angle iron clip and nut extending from a formed slot in the block sides forming a 4-inch opening to grip the steel beam. The sheave shall rotate free and true, and be installed so no rubbing or unintentional lateral movement of the cable or the sheave occurs.

N. Motorized winch drums: Drum shall consist of deep grooved pile-on winding drum, directly coupled to the line shaft. Drive shall be coupled to the operating shaft by a worm gear oil bath drive. Motor and brake combination shall be flange mounted directly to the gearbox. Entire assembly shall be mounted on a heavy channel base. Winch shall have a sufficient lifting capacity, as scheduled, at an average speed of 20 feet per minute. Winding drum shall be grooved to accept each lift cable with 45 feet of travel, with 3 dead wraps. The outboard end of the winch shaft shall be supported by a self aligning flange bearing. Drum shall be constructed of heavy cast iron or steel. Entire assembly shall be the product of one manufacturer. Provide keyed control master switch, hoist controls, (up, down, and stop) and universal emergency stop on a panels mounted in conference room directly under the line set.

O. The motorized unit shall have a combination Helical/Worm right angle reducer with integral motor and break. The gear case shall be cast iron and the shafts shall be protected by double lip oil seals. The gear train shall be double reduction with the helical gearing before the worm gearing. The motor shall have a minimum AGMA service factor of 1.0 for continuous operation and the gearing service factor shall be 1.0, with a mechanical strength service factor of 1.3.

P. The brake shall be direct acting AC, or DC electromagnetic with a manual release and a minimum retarding torque equal to 200% of motor full load torque. The brake shall be released by energizing the brake DC coil and the motor winding simultaneously to provide failsafe breaking.

Q. Each winch shall have a mechanical rotary type limit switch assembly as manufactured by GE or approved equal. The switch shall have 4 individually adjustable switch cam assemblies and shall be mounted in a way that facilitates easy access for adjustment and setup.

R. Additional cable takeup line shall consist, steel pickup line and cable cradle to facilitate automatic cable tracking and take-up for lineshaft lighting circuits. Borderlight cable shall completely retract above the ceiling when batten is fully out.

PART 3 - EXECUTION

3.01 PREPARATION

A. Furnish layouts for inserts, clips, or other supports required to be installed by other trades to support equipment. Coordinate the placement and installation of this equipment.

3.02 INSTALLATION, GENERAL

A. Install materials according to manufacturer's printed instructions and recommendations.

3.03 BATTEN INSTALLATION.

A. Install battens by suspending at proper heights with steel chains spaced at not more than 10 feet o.c.

B. Secure chains either directly to structures with beamclamps or other devices that are secure and appropriate to attachment, and that will not deteriorate or fail with age or elevated temperatures.

END OF SECTION 11 6133

SECTION 11 6143

STAGE CURTAINS

PART 1 GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.02 REFERENCE STANDARDS

A. NFPA 701 - Standard Methods of Fire Tests for Flame Propagation of Textiles and Films; 2019.

1.03 SUMMARY

A. This Section includes the following types of stage curtains:
   1. Front-setting curtains including front curtain.
   2. Intermediate-setting curtains including valance, and intermediate legs.
   3. Sky drop.

B. Related Sections: The following Sections contains requirements that relate to this Section:
   1. Division 11 Sections for stage equipment.
   2. Division 26 Sections for electrical wiring, connections, and installing remote control switches for draw curtain machines.

1.04 SUBMITTALS

A. General: Submit the following according to Conditions of the Contract and Division 1 Specification Sections.

B. Product data, installation instructions, and general recommendations, including data substantiating that materials comply with requirements.

C. Shop drawings including plans, elevations, and detail sections of typical rigging elements. Show anchors, hardware, operating equipment, and other components not included in manufacturer's standard product data.

D. Samples for verification purposes, 12 inches square of each fabric in color indicated and with flameproofing applied.

E. Product certificates signed by stage curtain fabricator certifying that the products comply with specified requirements.

1.05 QUALITY ASSURANCE

A. Fabricator/Installer Qualifications: Firm experienced in producing stage curtains similar to those indicated for this Project that have a record of successful in-service performance, and with sufficient production capacity to produce required units without causing a delay in the Work.

B. Fire-Performance Characteristics: Provide stage curtains that are certified to be flame resistant according to requirements of NFPA 701. Permanently attach label to each curtain indicating whether curtain is permanently and inherently flame resistant, or whether it will require retreatment after dry cleaning.

1.06 PROJECT CONDITIONS

A. Field Measurements: Check actual stage curtain openings by accurate field measurements before fabrication; show recorded measurements on final shop drawings. Coordinate fabrication schedule with construction progress to avoid delaying Work.

1. Where field measurements cannot be made without delaying the Work, guarantee opening dimensions and proceed with fabricating stage curtains without field measurements. Coordinate stage construction to ensure that actual opening dimensions correspond to guaranteed dimensions.

PART 2 PRODUCTS

2.01 FRONT-SETTING FABRIC

A. Woven Cotton Velour: Napped fabric of 100 percent cotton; 54-inch minimum width; not less than 40 backing ends per inch, 40 pile ends per inch, and 32 picks per inch; 640 pile tufts per square inch; and other characteristics as follows:
   1. Weight: Fabric weighing not less than 24 oz. per linear yard before flameproofing, with pile height of approximately 135 mils.
B. Lining: Yarn-dyed denim cloth of 100 percent cotton, woven in a warp-faced twill; 54-inch minimum width.
C. Colors: Where manufacturer's standard products are indicated, provide colors complying with the following requirements:
   1. For woven cotton velour, provide colors as follows:
      a. Provide Architect selections from manufacturer's full range of standard colors.
D. Product: Subject to compliance with requirements, provide the following velour fabric:
   1. Memorable, KM Fabrics, Inc.
   2. Velour, Rose Brand, NY, NY.
   3. Velour, Fox-Rich Textiles, Inc. Ridgefield, CT.

2.02 INTERMEDIATE-SETTING FABRIC

A. Duvetyn: 100 percent cotton short-napped fabric, twill weave with soft uniform texture, weighing not less than 8 oz. per linear yard before flameproofing; 54-inch minimum width.
B. Colors: Where manufacturer's standard products are indicated, provide colors complying with the following requirements:
   1. Provide Architect's selections from manufacturer's full range of standard colors, (black anticipated).

2.03 SKY DROP FABRIC

A. Muslin: Sheer, plain-woven fabric of 100 percent uncombed cotton weighing not less than 6 oz. per linear yard; Seamless fabric and construction.
   1. Color: Natural.
B. Subject to compliance with requirements, provide the from the following manufacturers or approved equal.
   1. KM Fabrics, Inc.
   2. Rose Brand, NY, NY.
   3. Fox-Rich Textiles, Inc. Ridgefield, CT.

2.04 METAL

A. Steel Pipe: ASTM A 53, Grade A, black, standard weight (Schedule 40), 1-1/2-inch nominal diameter, unless otherwise indicated.
B. Galvanized Steel Sheet: Zinc-coated carbon steel sheet of commercial quality, complying with ASTM A 526, G60 zinc coating; 0.075-inch (14-gage) minimum nominal thickness.
C. Supports, Clamps, and Anchors: Sheet steel in manufacturer's standard gages, galvanized after fabrication according to ASTM A 153, Class B.
D. ASTM A 413, 1/4-inch size, not less than 0.276-inch material diameter. (Consult bid documents, use this chain to suspend the devices, if selected by bid)

E. Inserts, Bolts, and Fasteners: Manufacturer's standard units.

2.05 CURTAIN FABRICATION

A. General: Provide not less than 100 percent additional fullness for front setting curtains, and 75 percent fullness for other curtains, unless otherwise indicated. Provide vertical seams unless otherwise indicated. Do not use fabric cuts less than half width. Fabricate velour curtains with the nap down.
   1. Vertical Hems: Provide vertical hems not less than 2 inches wide, with a 1-inch tuck, and machine-sewn with no selvage material visible from front of curtain. Sew open ends of hems closed.
   2. Leading Edge Turnbacks: Where specified, provide turnbacks formed by folding 12 inches of face fabric back with a 1-inch tuck and secured by sewing the turnback vertically.
   3. Top Hems: Reinforce top hems by double-stitching 3-1/2-inch-wide, heavy jute webbing to top edge with minimum 2 inches of face fabric turned under.
   4. Pleats: Provide fullness in curtains by sewing additional material into 6-inch double-stitched box pleats spaced at 12 inches o.c. along top hem reinforcing. Provide not less than No. 2 brass grommets, centered on box pleats, for tie lines or S hooks.
      a. Arrange vertical seams so that they do not fall on faces of pleats.
      b. For velour curtains provide not less than No. 3 grommets.
      c. For black curtains provide grommets with a black anodic finish.
   5. Bottom Hems: For curtains that do not hang to the floor, provide hems not less than 3 inches deep with 3/4-inch weight tape. For floor-length curtains, provide hems not less than 6 inches deep with 1-inch weight tape. Sew open ends of hems closed.
   6. Lining: Provide lining for front curtains in same fullness as face fabric, and finished 2 inches shorter than face fabric. Unless otherwise specified, provide lining constructed of same fiber type as face fabric. Attach lining to face fabric along bottom and side seams with 4-inch-long strips of heavy woven cotton tape.

B. Sky Drop: Fabricate from sky drop fabric, sewn flat with selvage to the rear. Provide 6-inch pipe pocket at bottom with a 6-inch flap, of same fabric, in front of the pocket. Provide 3-1/2-inch jute webbing at top with not less than No. 2 brass grommets spaced at 12 inches
   1. O.C. and 36-inch tie lines. Provide a 2-inch double folded side hem.

C. Battens: Fabricate battens from steel pipe with a minimum number of joints. As necessary for required lengths, connect pipe with a drive fit pipe sleeve not less than 18 inches long, and secure with four flush rivets, plug welds, threaded couplings, or another equally secure method. Shop-paint completed pipe battens with good quality black paint with 1-inch-wide yellow stripe at the center of each batten.

2.06 STRAIGHT CURTAIN TRACK FABRICATION

A. Steel Tracks, General: Fabricate of not less than 0.075-inch (14-gage) nominal thickness galvanized roll-formed steel, with continuous bottom slot, and with each half of track in one continuous piece.
   1. Provide curtain carriers for track spaced at 12 inches o.c.

B. Heavy-Duty Track: Use for front curtain, full stage travellers (full width with overlap), and for legs (12 foot lengths for each leg,without rope operaing devices). Equip track with heavy-duty live-end double pulley and heavy-duty dead-end single pulley, with 5-inch cast-iron or nylon wheels on ball bearings, enclosed in steel housings. Provide curtain carriers of molded nylon with a pair of neoprene- or nylon-tired ball-bearing wheels riveted parallel to body. Equip carriers with neoprene or rubber bumper, heavy-duty swivel eye, and trim chain for attaching curtain snap or S hook. Provide end stops for track and adjustable floor block designed to maintain proper tension on 3/8-inch stretch-resistant operating line of braided polypropylene or fiber-glass center cord, and 10 pound sandbag.

1. Equip carriers with back-pack guide accessory to permit offstage curtain folding.

C. Products: Subject to compliance with requirements, provide one of the following: Heavy Duty Track:
   1. Silent Steel Model No. 280, Automatic Devices Company.
   2. Tru-Roll Model No. 1000, Grosh Scenic Studios, Inc.
   3. Atlas Silk Model No. 400, H & H Specialties, Inc.

PART 3 EXECUTION

3.01 PREPARATION

A. Furnish layouts for inserts, clips, or other supports required to be installed by other trades to support tracks and battens. Coordinate all such work.

3.02 INSTALLATION, GENERAL

A. Install materials according to manufacturer's printed instructions and recommendations.

3.03 BATTEN INSTALLATION

A. Install battens by suspending at proper heights with 4/0 passing link steel chains spaced as indicated.
B. Secure chains either directly to structures or to inserts, eye-screws, or other devices that are secure and appropriate to substrate, and that will not deteriorate or fail with age or elevated temperatures.

3.04 TRACK INSTALLATION

A. Batten-Hung Tracks: Install track by suspending from pipe batten with manufacturer's special pipe clamps at recommended spacing.
   1. Heavy-Duty Track: Do not exceed 6 feet between supports.
B. Install track for center-parting curtains with not less than a 2-foot overlap of track sections at center, supported by special lap clamps.

3.05 CURTAIN INSTALLATION

A. Track-Hung: Secure curtains to track carriers with track manufacturer's special heavy-duty S hooks or snap hooks.
B. Batten Hung: Secure curtains to pipe battens with minimum 5/8-inch-wide by 36-inch-long braided soft cotton tie lines.
C. Revisit the jobsite not less than 90 days after installation is complete to retrim curtains to compensate for stretching.

END OF SECTION 11 6143

SECTION 11 6623

GYMNASIUM EQUIPMENT

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Furnish all labor, materials, equipment, tools and services required to fully complete all Gymnasium Equipment work as is indicated on the drawings and/or specified herein including, but not limited to, the following described items.
B. Basketball backboards, goals, and support framing.
C. Volleyball nets and posts.
D. Double ballet bars.
E. Indoor vertically retractable batting tunnel, soft
F. Do not include sales tax, refer to Section 00 0104 - Notice to Contractors.

1.02 RELATED REQUIREMENTS

A. Section 03 3000 - Cast-in-Place Concrete: Concrete floor slab to receive floor sleeves and anchors.
B. Section 04 2731 - Reinforced Unit Masonry: Wall substrate to receive wall mounted basketball systems and protection pads.
C. Section 05 1200 - Structural Steel Framing: Structural members supporting basketball systems.
D. Section 05 5000 - Metal Fabrications: Secondary structural members supporting gymnasium equipment.
E. Section 09 6463 - Wood Athletic Flooring: Layout and painting of court lines to be coordinated with installation of floor sleeves and anchors.
F. Section 11 6643 - Interior Electronic Scoreboards - shot clock mounted to basketball standard.
G. Division 26 - Electrical: Equipment wiring.

1.03 REFERENCE STANDARDS

A. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2021.
B. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2020, with Errata (2021).
C. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
D. NFPA 101 - Life Safety Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
E. ASTM A500 / A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes; 2010a.
F. ASTM B85 / B85M - Standard Specification for Aluminum-Alloy Die Castings; 2010.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Large Components: Ensure that large components can be moved into final position without damage to other construction.
B. Electrically Operated Equipment: Coordinate location and electrical characteristics of service connection.

1.05 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. Electrical characteristics and connection locations.
   2. Fire rating certifications.
   3. Structural steel welder certifications.
   4. Manufacturer's installation instructions.
C. Shop Drawings: For custom fabricated equipment indicate, in large scale detail, construction methods; method of attachment or installation; type and gage of metal, hardware, and fittings; plan front elevation; elevations and dimensions; minimum one cross section; utility requirements as to types, sizes, and locations.
D. Erection Drawings: Detailed dimensional requirements for proper location of equipment.
E. Samples: Submit samples of wall pad coverings in manufacturer's available range of colors.
F. Operating and maintenance data, for each operating equipment item.
G. Warranty: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

1.06 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than five years of documented experience.
B. Installer Qualifications: Company specializing in performing work of the type specified with minimum five years of experience.

1.07 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.
D. Contractor's advertising in the form of a logo or otherwise shall not be visibly displayed on installed equipment.

1.08 WARRANTY

A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
B. Provide Manufacturer's Warranties:
   1. Basketball Backstop Structure: 25 years.
   2. Backboards installed with Goal Brace: Lifetime warranty against breakage.
   3. Volleyball System: 5 years.
   4. Wall Pads: 5 years.
   5. Baseball cages: 5 years.
C. The Contractor shall guarantee his work for a period of 5 years from date of Substantial Completion. Guarantee shall be on form included in Section 01 7800.

PART 2 PRODUCTS

2.01 GYMNASIUM EQUIPMENT - GENERAL REQUIREMENTS

A. See drawings for sizes and locations.
B. Where mounting dimensions or sizes are not indicated, comply with applicable requirements of the following:
   1. National Federation of State High School Associations (NFHS) sports rules.
C. Provide mounting plates, brackets, and anchors of sufficient size and strength to securely attach equipment to building structure; comply with requirements of contract documents.

D. Hardware: Heavy duty steel hardware, as recommended by manufacturer.
E. Electrical Wiring and Components: Comply with NFPA 70; provide UL-listed equipment.
F. Structural Steel Fabrications: Welded in accordance with AWS D1.1/D1.1M, using certified welders.

2.02 BASKETBALL EQUIPMENT

A. Manufacturers:
   1. ADP-Lemco, Inc: www.adplemco.com.
   2. Performance Sports Systems: www.perfsports.com.
   3. Porter Athletic Equipment Company: www.porter-ath.com.
   4. Spalding Equipment: www.spaldingequipment.com.
   5. Draper, Inc: www.draperinc.com.
   6. Substitutions: See Section 01 6000 - Product Requirements.
B. All components including framing, backboard, goals, electric winches, controls, and accessories for basketball backstop assemblies shall be products of a single manufacturer.
C. Main and Auxiliary Gyms - 14 Required:
   1. Backstop: Ceiling Suspended, Forward Folding, Rear Braced Basketball Backstop.
      a. Distance from court floor to backstop attachment at roof structure: As indicated on Drawings.
      b. Main frame: Rigid T design of back-to-back right triangles constructed by welding together steel tubing of the following outside diameters and gauges.
         1) Main center stem: 6 inches diameter, 11 gauge (0.13 inch thick) of length sufficient to allow backstop height adjustment of plus or minus 6 inches.
         2) Top member of T frame: 4 inches diameter, 11 gauge (0.13 inch).
         3) Folding rear brace: Jackknife type, fully adjustable, self-locking with positive latch in down position constructed from 2-1/2 inches diameter, 13 gauge (0.09 inch thick) outer tube and 2-1/4 inches diameter, 14 gauge (0.08 inch) inner tube.
         4) Diagonal side braces: 2-1/4 inches diameter, 14 gauge (0.08 inch thick).
      c. Pivot point: 1-1/4 inches diameter solid steel shaft and 1/2 inch steel plate hangers.
      d. Basis of Design Manufacturer: Draper, Inc., www.draperinc.com.
         1) Main Gymnasium:
            (a) (6) front folding rear braced (TF-20J).
         2) Aux Gymnasium:
            (a) (4) front folding rear braced (TF-20J).
            (b) (2) bent stem, front folding front braced (TF-20S).
   2. Electric Winch: Fully enclosed, direct drive, worm gear, electric winch designed to hold backstop at any position during raising and lowering.
      a. Motor: 1 HP, 13.2 AMP, capacitor type, 60 cycle, 110 volt, single phase with automatic thermal overload protection manufactured in compliance with NEMA specifications. (Verify with Manufacturer)
      b. Hoist cable: 1/4 inch diameter, 7 by 19, galvanized aircraft cable with 7,000 pounds (3175 kg) ultimate breaking strength.
      c. Roller: Spring-load providing tensioning pressure to ensure cable tracks evenly on grooved drum.
      d. Limit switches: Rotary counting up and down type, pre-wired to motor as integral part of winch.
      e. Controls: Provide key lock, 3 position, momentary contact wall control switch to lower, raise, and stop backstop.
         1) Provide two keys, one controlling up direction and second controlling down direction.

2) Provide with stainless steel cover plate.

f. Acceptable Product: Model 503085 Motorized Winch as manufactured by Draper, Inc.

3. Safety Belt and Lock: Safety belt and lock tested to withstand 1000 pounds (454 kg) free fall load.
   a. Safety lock: Inertia sensitive to automatically lock backstop in position at any time during storage, raising, or lowering. Sudden increase in either tension or speed shall activate lock.
   b. Safety belt: 2 inches wide nylon belt rated at 6000 pounds (2721 kg) breaking strength.
   c. Belt shall extend 35 feet and shall be automatically retracted and stored on reel equipped with constant force spring. Operation and locking action shall be activated by centrifugal force to lock backstop before unit travels 12 feet of free fall.
   d. Unit shall incorporate automatic reset not requiring poles, ropes, levers, or buttons for resetting.
   e. Acceptable Product: Posilock Safety Belt 503029 as manufactured by Draper, Inc.(Ten Required)
4. Backboard: Rectangular, fiberglass, official size backboard. (Eight required.)
   a. Size: 72 inches wide by 42 inches high.
   b. Construction: Impregnated honeycomb core with fiberglass front and back facings. Attachment holes made through solid plastic blocks in honeycomb. Equip with mounting brackets on back side and factory drill holes for goal mounting.
   c. Finish: Factory applied, white, high gloss gel finish with molded-in orange border and target lines.
   d. Acceptable Product: Model 503144 as manufactured by Draper, Inc.
5. Backboard:
   a. Model 64-SW Glass Backboard (Four Required)
      1) Model 64-SW: "Pro" 42 inches high by 72 inches wide. Backboard to be manufactured from 1/2 inch tempered plate glass which is set into .125 inch thick vinyl and supported by a heavy .25 inch wall 6063 T6 aluminum frame. Reinforcing inner frame behinmd glass supports goal. This inner frame dissipates all stresses from teh goal to the upper and lower frame by means of a 1/2 inch by 1 1/2 inch steel vertical member. Four machined bushings extend from the inner-frame through the glass and support the goal without allowing the goal or supporting mechanism to touch any portion of the glass. Goal installation holes shall be 5 inches center to center horizontally and 4 inches center to center vertically. The official border and target will be fused to the glass during the tempering process with frit ceramic paint. This backboard meets all NCAA and NFSHSA specifications.
6. Goals: Breakaway goal with tube-tie net attachment and designed to withstand shock loads from player slam dunking or hanging on rim.
   a. Rim shall deflect down when 230 pounds (104 kg) static load is applied and return to playing position when load is removed. Breakaway point shall be adjustable form 160 to 230 pounds (73 to 104 kg).
   b. Ring shall have rebound characteristics identical to those of non-moveable ring. Factory set proper flex and rebound requirements.
   c. Ring: Fabricated from 5/8 inch diameter steel rod formed into 18 inch ring. Rigidly brace with die cut steel braces welded to rim.
   d. Mounting plate: Heavy duty steel plate bracket with mounting holes and designed to position inside of ring 6 inches from backboard.
   e. Provide series of small tubes welded to bottom of rim providing for attachment of net by threading 9 gauge (0.15 inch diameter) wire through tubes.

f. Finish: Powder coated orange paint.
g. Anti-whip net: Top half made of durable fibers encased in nylon to prevent net from whipping up on rim. Lower half all nylon. Color white.
h. Mounting hardware: Zinc plated.
i. Acceptable Product: Model 503581 as manufactured by Draper, Inc.

7. Safety Edge Padding: Foam padding for bottom edge and corners of backboard to provide safety protection.
   a. Construction: Molded foam, 2 inches wide and wrapping around edges 3/4 inch. Equip with molded-in steel track and bolt-on attachment system. Padding shall cover bottom edge of backboard and extend 15 inches up sides.
   b. Color: As selected by Architect from manufacturer's standard colors.
   c. Acceptable Product: Model 5032XX Bolt-On Safe-Edge Padding as manufactured by Draper, Inc.

2.03 VOLLEYBALL NET SYSTEMS AND FLOOR SLEEVES

A. Manufacturers:
   1. ADP-Lemco: www.adplemco.com.
   2. Spalding Equipment: www.spaldingequipment.com.
   3. Porter Athletic Equipment Company: www.porter-ath.com.
   4. Draper, Inc: www.draperinc.com.
   5. Substitutions: See Section 01 6000 - Product Requirements.

B. All volleyball equipment, components, and accessories shall be products of a single manufacturer.

C. Court Assembly - 4 Sets Required.
   1. Floor Sleeves and Covers:
      a. Floor Sleeve: Round, mechanical steel tube sleeve welded to steel anchor plate for casting in concrete floor to receive volleyball standard.
         1) Size: 3-1/2 inches inside diameter by 8-1/2 inches tube and 4 inches square anchor plate.
         2) Acceptable Product: Floor Sleeve 501006 as manufactured by Draper, Inc.
      b. Cover plate: 7-3/8 inches solid brass floor plate and permanently attached hinged cover.
         1) Cover installed with flat head brass wood screws.
         2) Opening diameter: 4-1/4 inches.
         3) Acceptable Product: Cover Plate 501002 as manufactured by Draper, Inc.
   2. Telescoping Standards:
      a. Telescoping standards fabricated from Schedule 80 aluminum bottom and upper tubes and capable of adjusting from 73 inches to 100 inches in 1 inch increments to meet all age group height settings.
         1) Pair of standards, one with tensioning winch and other with adjustable cable anchoring collar. Both standards equipped with single pulley sheave on upper telescoping tube section.
      b. Bottom Tube Section: 3-1/2 inches diameter with 0.30 inch wall thickness, 72 inches high. Bottom provided with rubber foot to protect floors.
      c. Upper Telescoping Tube Section: 2-7/8 inches diameter with 0.28 inch wall thickness.
      d. Pulley Sheaves: 4 inches diameter pulley and oilite bushing attached to top of upper telescoping tube.
      e. Tensioning Winch: Heavy-duty, self-locking ratchet mechanism with compression clutch brake type release mechanism.
         1) Position winch on outside of bottom tube.

2) Equip winch with 2 inches wide, high tensile nylon strap with sling ring and S-hook for connection to net cable.
3) Winch operated by removable handle.

f. Acceptable Product: Standard PVS-01 as manufactured by Draper, Inc.

3. Volleyball Net: High quality No. 36 black nylon chord woven in 4 inches square mesh.
   a. Size: 32 feet long by (39-3/8 inches) (39.37 inch) high.
   b. Provide double stitched, vinyl coated polyester hem around perimeter of net. At net ends, provide hem with pocket containing 1/2 inch diameter fiberglass dowel.
   c. Net cable: 1/8 inch diameter, 2000 pounds (907 kg) minimum breaking strength, galvanized aircraft cable with nylon coating. Equip ends with loops formed with heavy swadged type fittings. Run cable through top hem.
   d. Rope tensioner: Provide bottom hem with 1/4 inch braided nylon rope and spring loaded tensioner.
   e. Provide each net end with three 1 inch wide polypropylene tension straps with buckles for tightening net.
   f. Boundary markers: Pair of 2 inches wide, white, polyester reinforced vinyl strips to attach with snap fasteners to ends of net at boundary lines.
   g. Antennae: Pair of 3/8 inch diameter fiberglass rods with red and white stripes.
      1) Antennae held in vinyl pockets attached to net with string ties.
      2) Antennae to extend above net 32-1/2 inches.
   h. Acceptable Product: Net 500004 as manufactured by Draper, Inc.
4. Protection Pads: Removable, rectangular protection pads with hinged corners to be attached to standards to protect players.
   a. Foam: 1-1/4 inches thick ethafoam.
   b. Cover: 14 ounces (397 grams), polyester reinforced vinyl.
      1) Vinyl color: As selected by Architect from manufacturer's full range.
   c. Provide each pad with 3 hook and loop fastening straps.
   d. Acceptable Product: Protection Pads 5011XX and 5012XX as manufactured by Draper, Inc.
5. Transporter: Heavy-duty unit with swivel casters designed to store and transport standards, net, protection pads, and other components and accessories required for setting up volleyball court.
   a. Acceptable Product: Volleyball Transporter 501016 as manufactured by Draper, Inc.

D. Materials:
   1. Structural steel tubing: Steel, mechanical, round tubing conforming to ASTM A500.
   2. Extruded aluminum tubing: Schedule 80, ASTM B221, alloy 6063 Temper T5.
   3. Aluminum castings: ASTM B85.

2.04 DOUBLE BALLET BAR

A. Manufacturers:
   1. Gibson: www.gibsongymnastics.com.
   2. The Barre Company: www.theballetbarrecompany.com.
   3. Substitutions: See Section 01 6000 - Product Requirements.

B. Components:
   1. Double Floor Mounted Upright: Steel upright, powder coated with plated staff. Top bar at 42 inches high and bottom bar at 32 inches high.
   2. Bars: 1 1/2 inch diameter hand sanded maple rails. Lengths as shown on drawings.
   3. Floor Anchors: Manufacturer's recommended anchors for project conditions.

2.05 INDOOR VERTICALLY RETRACTABLE BATTING TUNNEL - SOFTBALL

A. Indoor Vertically Retractable Batting Tunnel:

1. Project-Specific Supplementary Support Structure.
    a. Includes Building Connections, Overhead Supports and 1.900" O.D. x 0.145" Wall Steel Drive Pipe Assembly.
    b. Super Durable Powder Coated Finish (Various Colors Available).
    c. Note: Main Building Support Structure by Others

B. LynRus CW3 Motorized Lift Winch.
1. 1 3/4 Horespower (Electric).
    a. 110/115 V Single Phase, 11.5 FLA.
    b. 1,000 lbs. Vertical Lift Capacity.
    c. 9.5 ft/min Pull Speed.
    d.
    e. Weight: 56 lbs.
    f. Includes 5-Foot Power Cord with Twist Lock Plug, Toggle Key Switch and Electrical Box.
    g. Note: Electrical by Others.

C. Netting Support Frame
1. 1-3/4" Sq. x 14 Gauge Wall Steel Tubing.
2. Bolted Connections.
3. Powder Coated Black.

D. Batting Tunnel Net.
1. 13’H x 15’W x 55’L Softball Standard #60 Black Nylon Net, 1-7/8"Square Mesh with Rope Bound Perimeter.
    a. #60 Twisted Knotted Netting.
    b. 100% Nylon Construction.
    c. 2.95mm (0.116") Diameter Twine.
    d. 84% Open Mesh Area (See-Through Visibility).
    e. 560 lb. Minimum Breaking Strength.
    f. 1-7/8" (48mm) Maximum Square Mesh Size.
    g. 0.067 lbs. per Square Foot.
    h. Black Multi-Filament Polypropylene Solid Braid Derby Rope Sewn Binding on Perimeter Edges – 1/4-inch Diameter, 530 lb. Minimum Breaking Strength.
    i. UV and Weather Treated.
2. (2) 4’W x Full Height Openings with Curtain Style Exterior Overlap Flaps
3. Netting Sits on Frame in "Up" Position.

E. Basis of Design:
1. BTIVRS – Indoor Vertically Retractable Batting Tunnel; Softball as Manufactured and Supplied by: Sportsfield Specialties, Inc., www.sprtsfield.com.
2. Substitutions: See Section 01 6000 - Product Requirements.

PART 3 EXECUTION

3.01 EXAMINATION

A. Take field measurements to ensure proper fitting of work. If taking field measurements before fabrication will delay work, allow for adjustments within recommended tolerances.
B. Inspect areas and conditions before installation. Notify Architect in writing of unsatisfactory or detrimental conditions. Do not proceed until conditions have been corrected. Commencing installation constitutes acceptance of work site conditions.
C. Verify that electrical services are correctly located and of the proper characteristics.

3.02 INSTALLATION

A. Install in accordance with contract documents and manufacturer's instructions.

B. Coordinate installation of inserts and anchors that must be built in to flooring or subflooring.
C. Install equipment rigid, straight, plumb, and level.
D. Secure all equipment with manufacturer's recommended anchoring devices.
E. Separate dissimilar metals to prevent electrolytic corrosion.

3.03 ADJUSTING

A. Verify proper placement of equipment.
B. Verify proper placement of equipment anchors and sleeves. Use actual movable equipment to be anchored if available.
C. Adjust operating equipment for proper operation; remove and replace equipment causing noise or vibration. Lubricate equipment if recommended by manufacturer.

3.04 CLEANING

A. Remove masking or protective covering from finished surfaces.
B. Clean equipment in accordance with manufacturer's recommendations.

3.05 PROTECTION

A. Protect installed products until Substantial Completion.
B. Replace damaged products before Substantial Completion.

3.06 DEMONSTRATION

A. Demonstrate to Owner's designated representative complete operation and required maintenance for folding basketball backstops and volleyball system.
B. Submit operation and maintenance manuals in accordance with Section 01 7800 - Closeout Submittals.

END OF SECTION 11 6623

SECTION 11 6643

INTERIOR ELECTRONIC SCOREBOARDS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Furnish all labor, materials, equipment, tools and services required to fully complete all Electronic Scoreboard work as indicated on the drawings and/or specified herein including, but not limited to, the following described items.
B. Interior electronic multi-purpose basketball / volleyball scoreboards: (Main Gymnasium - 1 required).
   1. Include wireless control centers (1 required).
C. Shot clock (Main Gymnasium - 2 required).
D. Do not include sales tax, refer to Section 00 0104 - Notice to Contractors.

1.02 RELATED REQUIREMENTS

A. Section 04 2731 - Reinforced Unit Masonry: Mounting substrate.
B. Section 05 1200 - Structural Steel Framing: Support structure.
C. Section 09 2116 - Gypsum Board Assemblies: Mounting substrate.
D. Section 11 6623 - Gymnasium Equipment.
E. Division 26 - Electrical: Electrical supply, conduit, and wiring for scoreboard and control center.

1.03 REFERENCE STANDARDS

A. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
B. UL 48 - Standard for Electric Signs; 2011.
C. FCC Part 15 - Regulations for Low Power, Non-Licensed Transmitters; Current Edition, Including All Revisions.
D. UL 1433 - Standard for Control Centers for Changing Message Type Signs; Current Edition, Including All Revisions.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordination: Coordinate the installation of scoreboards with installation of service utilities and mounting structures.
B. Preinstallation Meeting: Conduct a preinstallation meeting one week prior to the start of the work of this section; require attendance by all affected installers.

1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide manufacturer's product illustrations, data and literature full describing the scoreboards and accessories proposed for installation.
C. Shop Drawings: Indicate locations, face layout, dimensions, construction, electrical wiring diagrams, and method of anchorage.
D. Selection Samples: Provide 2 copies of manufacturer's full line of colors.
E. Operation Data: Provide manufacturer's operation instructions.
F. Maintenance Data: Provide manufacturer's maintenance instructions.
G. Warranty: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

1.06 QUALITY ASSURANCE

A. Designer Qualifications: Design structural support framing components under direct supervision of a Professional Structural Engineer experienced in design of this Work and licensed in Utah.
B. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than five years of documented experience.
C. Installer Qualifications: Company specializing in performing the work of this section with minimum five years of documented experience.
D. Scoreboards and other electrical components shall be certified for use in the United States by Underwriter Laboratories, (UL), Inc. and shall bear UL label.
E. Scoreboards and other electrical components shall be electrically grounded in accordance with National Electrical Code (NEC), Article 600.

1.07 PROJECT CONDITIONS

A. Environmental Limitations: Do not install scoring equipment until spaces are enclosed and weatherproof, wet work in spaces is complete and dry, and ambient temperature and humidity conditions are maintained at the levels indicated for project when occupied for its intended use.
B. Field Measurements: Coordinate scoreboard location and height with the customer. Verify dimensions by field measurements.
C. Supply weight and mounting method for owner to verify that building structure is capable of supporting the scoreboard’s weight in addition to the auxiliary equipment.

1.08 DELIVERY, STORAGE, AND PROTECTION

A. Deliver scoreboards to project site in manufacturer's original packaging.
B. Store components off the ground in a dry covered area, protected from adverse weather conditions.

1.09 WARRANTY

A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
B. Correct defective Work within a two year period after Date of Substantial Completion. Complete Guarantee form bound in Section 01 7800.
C. Provide five year manufacturer warranty for parts and labor for scoreboards, controls and accessories.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Interior Scoreboards:
    1. Daktronics Scoreboards: www.daktronics.com.
    2. Fair-Play Scoreboards: www.fair-play.com.
    3. Nevco Scoreboard Company: www.nevco.com.
    4. Substitutions: See Section 01 6000 - Product Requirements.

2.02 BASKETBALL / VOLLEYBALL SCOREBOARDS

A. Single-sided basketball / volleyball scoreboard. Scores HOME and GUEST to 199, PERIOD to 9, team FOULS to 19, PLAYER number to 99, player FOUL to 9, indicates possession and bonus, displays period time to 99:59 and during the last minute of the period, it displays time to 1/10 of a second.
B. General Information:
    1. Dimensions: 6 feet high, 8 feet wide, 6 inches deep.

2. Weight: 180 lb (82 kg).
3. Power requirement: 120 VAC, 1.7 Amps, 200 W.
4. Custom Color: To be selected by Architect.

C. Construction:
1. All-aluminum construction.
2. Scoreboard face and perimeter: 0.063 inch thick.
3. Scoreboard back: 0.050 inch thick.
4. Digit faceplates: 0.090 inch thick.
5. Cabinet withstands high-velocity impact from indoor sports balls without the need for protective screens.

D. Digits:
1. LED Digit Technology: A diffusant over the LEDs blends the light achieving a uniform look with 140 degrees wide viewing angle.
2. Clock and Score Digits: 13 inches high.
3. PERIOD, FOULS, PLAYER/FOUL digits: 10 inches high.
4. Optional Time Outs Left Digits: 7 inches high.
5. Clock, Colon, PERIOD, PLAYER/FOUL, and T.O.L Digits and Indicators: Amber LEDs.
6. Score and FOULS Digits and Possession Indicators: Red LEDs.

E. Captions/Graphics:
1. HOME and GUEST Captions: 6 inches high.
2. PERIOD, FOULS/SCORE, PLAYER/FOUL/MATCH Captions: 4 inches high.
3. All Captions: White vinyl applied directly to scoreboard face.
4. Vinyl team name caption in place of the Home caption.
5. Scoreboard striping.

F. Logo/Sponsor Panels:
1. Two 17 inches high, 21 inches (20.98 inch) wide logo/sponsor panels on the top corners of the scoreboards. Vinyl logo/sponsor graphics.

G. Horn:
1. Vibrating horn: Mounts behind scoreboard face.
2. Sounds automatically when period clock counts down to zero.
3. Sounds manually as directed by operator.

H. Power Cord:
1. Cord is 11 feet (3353 mm) long.
2. Cord plugs into a standard grounded 120 V AC outlet.

I. Accessories:
1. Hardware for suspension installation.

J. Scoring Console:
1. Capable of scoring basketball and volleyballthrough the use of keyboard inserts.
2. Maximum power requirement of 5 watts.
3. Console recalls clock, score, and period information if power is lost.
4. Console includes:
    a. Rugged aluminum enclosure to house electronics.
    b. Sealed membrane water-resistant keyboard.
    c. 32-character liquid crystal prompting display to verify entries and recall information currently displayed.
    d. 6 foot power cord to plug into a standard grounded 120 V AC outlet.
    e. 2.4 GHz spread spectrum radio for scoreboard control.
    f. Practice timer mode:
        1) Sounds the horn at the end of each segment.
        2) Has 99 programmable segments.
        3) Displays the segment number and segment length.

4) Has a programmable interval time.

5. Accessories:
   a. Console carrying case.
   b. Battery pack.
   c. Hardware necessary for complete installation.

K. Acceptable Product: BB-2103 Scoreboard with All Sport 5000 Controller manufactured by Daktronics Scoreboards.
   1. Shot Clock - model BB-2115 by Daktronics.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify exact scoreboard locations with Architect.
B. Coordinate requirements for electrical power, wall blocking, auxiliary framing and supports, suspension cables, and other components to be provided under other specification Sections to ensure adequate provisions are made for complete, functional installation of scoreboards.
C. Coordinate scoreboard electrical requirements to ensure proper power source, conduit, wiring, and boxes are provided. Prior to installation, verify type and location of power supply.

3.02 INSTALLATION

A. Install scoreboards and accessories in accordance with manufacturer's instructions and approved shop drawings.
B. Before installation, field test scoreboards and accessories for operating functions. Ensure that scoreboards accurately perform all operations. Correct deficiencies.
C. Rigidly mount scoreboards and accessories level and plum with brackets and fasteners.
D. Clean exposed surfaces.
E. Protect scoreboards and finishes from other construction operations.

3.03 CLEANING

A. Clean exposed surfaces as recommended by manufacturer.

3.04 CLOSEOUT ACTIVITIES

A. See Section 01 7900 - Demonstration and Training, for additional requirements.
B. Demonstrate proper operation of equipment to Owner's designated representative.

END OF SECTION 11 6643

SECTION 11 6833

ATHLETIC FIELD EQUIPMENT

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Furnish all labor, materials, equipment, tools and services required to fully complete all Athletic Field Equipment work as is indicated on the drawings and/or specified herein including, but not limited to, the following described items.
B. Softball Dugout Equipment:
   1. Helmet Racks with Coaches Racks (2 required).
   2. Bat Racks (2 required.
   3. Player Benches (2 required).
   4. Fence Top and Rail Padding at Dug Out Fence.
C. Softball Field Equipment:
   1. Base Bags with Storage Cart (1 set required).
   2. Home Plate (1 required).
   3. Pitching Rubbers (5 required).
   4. Bull Pin Home Plates (2 required).
   5. Throw Down Home Plates (2 required).
   6. Foul Poles with Ground Sleeves (2 required).
   7. Fence Guard Caps at Side Line Fence.
   8. BaseZone Field Wall Padding Protective Padding and Accessories
D. Alternate No. 2 - refer to specification 01 2300 Alternates
   1. Base Bid - Not Included.
   2. Alternate - Softball Field, Double Batting Tunnel Frame and Nets.
E. Soccer Field Equipment:
   1. 20-foot-high pole to pole netting system.
F. Do not include sales tax, refer to Section 00 1115 - Advertisement for Prequalification of Bidders.

1.02 RELATED REQUIREMENTS

A. Section 03 3000 - Cast-In-Place Concrete.
B. Section 32 0001 - Warning Track Mix.
C. Section 32 0002 - Baseball Mound Clay.
D. Section 32 0003 - Warning Track Mix.
E. Section 32 1313 - Concrete Paving.
F. Section 32 3113 - Chain Link Fences and Gates.
G. Section 32 9223 - Sodding.
H. Section 32 1813 - Synthetic Grass Surfacing.
I. Section 32 1823 - Synthetic Running Track Surfacing.

1.03 REFERENCE STANDARDS

A. NCAA (SR) - Softball Rules; current edition.
B. NFHS (Guide) - Court and Field Diagram Guide; current edition.

1.04 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.

1.05 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 manufacturer's installation instructions.
C. Shop Drawings: Indicate construction methods; method of attachment or installation; type and gage of metals, hardware, and fittings; elevations and dimensions; and locations.
D. Erection Drawings: Detailed dimensional requirements for proper location of equipment.
E. Samples: Submit samples of manufacturer's available range of colors.
F. Warranty: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

1.06 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years of documented experience.
B. Installer Qualifications: Company specializing in performing the work of this section with minimum three years of documented experience.
C. Copies of Documents at Project Site: Maintain at the project site a copy of each referenced document that prescribes execution requirements.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Deliver equipment to project site in manufacturer's original packaging.
B. Store equipment in accordance with manufacturer's instructions; protect from damage.

1.08 GUARANTEE

A. The Contractor shall guarantee this work for a period of One (1) year from date of Substantial Completion. Guarantee shall be on form included in Section 01 7800.

PART 2 PRODUCTS

2.01 SOFTBALL DUGOUT EQUIPMENT

A. Manufacturers:
    1. Sportsfield Specialties, Inc: www.sportsfieldspecialties.com.
    2. Jaypro Sports, Inc: www.jaypro.com.
    3. Porter Athletic, Inc: www.porterathletic.com.
    4. SportsEdge: www.sportsedge.com.
    5. Baseball Racks: www.baseballracks.com.
    6. Substitutions: See Section 01 6000 - Product Requirements.
B. 12 Helmet Rack with Coaches Rack:
    1. Materials: 3/4 inch marine grade plywood with 1/4 inch marine grade plywood back.
    2. Finish: Exterior enamel paint.
        a. Colors: Custom colors as selected by Architect.
    3. Size: As shown on Drawings.
    4. Acceptable Product: 12H manufactured by Baseball Racks.com.
C. Bat Rack (holds 21 bats):
    1. Materials: 3/4 inch marine grade plywood.
    2. Finish: Exterior enamel paint with finish coat of polyurethane.
        a. Colors: Custom colors as selected by Architect.
    3. Size: 18 inches high by 47 1/2 inches long by 12 inches deep.
        a. Bat will go 11 1/4 inches deep into individual protective bat sleeves.
    4. Acceptable Product: BlackJack Bat Rack manufactured by Baseball Racks.com.

D. Wall Mounted Player Bench:
   1. Length: 30 feet (9.1 m).
   2. Frame: 1/8 inch (3 mm) thick aluminum bent frame, designed to allow for two level seating.
      a. Finish: Powder Coated, custom color to be selected by Architect.
   3. Support: 11 gage (3.18 mm) steel support frame.
      a. Finish: Powder Coated, custom color to be selected by Architect.
   4. Planking: 2 inch (50 mm) by 4 inch (100 mm) and/or 2 inch (50 mm) by 6 inch (150 mm) poly board.
      a. Color: To be selected by Architect from manufacturer's full range.
   5. Accessories:
      a. Galvanized steel mounting z-brackets.
      b. Stainless steel assembly hardware.
      c. Galvanized steel anchoring hardware.
   6. Acceptable Product: Wall Mounted Two Tier Polyboard Team Bench manufactured by Sportsfield Specialties, Inc.

E. Fence Top and Rail Padding:
   1. Components: 2 inch (50 mm) thick foam encased in 18 oz. vinyl with grommets for attachment every 6 inches (150 mm).
   2. Color: To be selected by Architect from manufacturer's full range.
   3. Acceptable Product: PRAFTP6 manufactured by SportsEdge.

2.02 SOFTBALL FIELD EQUIPMENT

A. Manufacturers:
   1. Sportsfield Specialties, Inc: www.sportsfieldspecialties.com.
   2. Jaypro Sports, Inc: www.jaypro.com.
   3. Porter Athletic, Inc: www.porterathletic.com.
   4. SportsEdge: www.sportsedge.com.
   5. Batting Cages, Inc: www.battingcagesinc.com.
   6. Substitutions: See Section 01 6000 - Product Requirements.

B. General: Meet all National High School Federation NFHS (Guide) and NCAA (SR) rules.

C. Base Bags with Storage Cart:
   1. Base Bags (3 per set): Heavy duty white rubber cover over high density foam with welded steel stanchion pan. Include posts, ground anchors, and rubber plugs.
      a. Acceptable Product: BB-500 manufactured by Jaypro Sports, Inc.
   2. Accessories:
      a. Base Storage Cart: Heavy duty square steel frame and pneumatic tires.
         1) Acceptable Product: BBBCART manufactured by Jaypro Sports, Inc.
      b. Base Dig-Out Tool.
         1) Acceptable Product: BB-DIGOUT manufactured by Jaypro Sports, Inc.

D. Home Plate:
   1. Components: Hard white rubber plate with black beveled edges and steel stanchion plate. Include post, ground anchor, and rubber plug.
   2. Acceptable Product: HP-200 manufactured by Jaypro Sports, Inc.

E. Four Way Pitching Rubber:
   1. Components: High-durability molded white rubber with PVC inner core.
   2. Size: 6 inches (150 mm) square by 24 inches (600 mm) long.
   3. Acceptable Product: PR-624 manufactured by Jaypro Sports, Inc.

F. Bull Pin Home Plate:
   1. Components: Hard white rubber plate with black beveled edges and steel stanchion plate. Include five removable zinc-plated steel spikes.

2. Acceptable Product: HP-250 manufactured by Jaypro Sports, Inc.

G. Throw Down Home Plate:
1. Components: Heavy-duty, molded rubber plate with waffle bottom and beveled edges.
2. Acceptable Product: HP-300 manufactured by Jaypro Sports, Inc.

H. Double Batting Tunnel Frame and Nets:
1. Size: 30 feet (9.1 m) wide by 75 feet (22.9 m) long by 15 feet 8 7/8 inches (4/8
2. Frame Components:
   a. Uprights: 4 inch (100 mm) outside diameter by 1/8 inch (3 mm) thick aluminum tube.
   b. Crossbars: 4 inch (100 mm) outside diameter by 1/8 inch (3 mm) thick aluminum tube.
   c. Arm Net Attachments (single and double): 2 inch (50 mm) square by 1/8 inch (3 mm) thick aluminum tube and 4 inch (100 mm) Schedule 40 aluminum pipe.
   d. Finish: Powder Coat, custom color as selected by Architect.
3. Nets (2 required):
   a. Fabric: No. 36 black nylon 1 3/4 inch (45 mm) mesh.
   b. Size: 15 feet wide by 55 feet (21.3 m) long by height required.
4. Accessories:
   a. Ground Sleeves (with ground sleeve caps): 4.30 inch (109 mm) outside diameter by 0.20 inch (5 mm) thick aluminum tube.
      1) Length: 30 inches (762 mm).
      2) Finish: Mill Finish.
   b. Stainless steel assembly hardware.
   c. Quick-Clips for net attachment.
   d. Tethers.
   e. Black vinyl coated wire rope.
5. Acceptable Product: LGOBT-SD-P manufactured by Sportsfield Specialties, Inc.

I. Batting Cage Turf Rolls (2 required)
1. Size: 15 feet by 55 feet.
2. Basis of Design Product: GT34 - Batting Cage Turf Rolls by ondecksports.com.

J. Foul Poles:
1. Height: 20 feet (6.1 m) above ground height.
2. Components:
   a. Main Upright: 4 inch (100 mm) outside diameter by 1/8 inch (3 mm) thick 6061 aluminum tube.
   b. Angled Wing Panel: 1/8 inch (3 mm) thick stamped aluminum 1.5 inch square mesh with double reinforced bends and welded at corners.
      1) 18 inches (457 mm) wide by 12 feet (3.7 m) high.
3. Finish: Powder Coat, yellow.
4. Accessories:
   a. Ground Sleeve: 4.30 inch (109 mm) outside diameter (4.10 inch (104 mm) inside diameter) aluminum tube with ground sleeve caps.
      1) Length: 48 inches (1219 mm).
      2) Finish: Mill finish.
   b. Stainless steel assembly bolts and nuts.
5. Acceptable Product: LGFPW420 manufactured by Sportsfield Specialties, Inc.

K. Fence Guard Caps:
1. Exterior grade UV resistant polyethylene with pre-drilled holes at 24 inches (610 mm) on center and zip ties.
2. Size: 2.62 inches (67 mm) wide by 4 inches (100 mm) high by 8 feet (2438 mm) long by .07 inch (1.8 mm) thick.
3. Color: As selected by Architect from manufacturer's full range of colors.

4. Acceptable Product: FG810 manufactured by SportsEdge.

L. Wall Padding and Accessories
   1. BASE: BaseZone Field Wall Padding Protective Padding and Accessories as Manufactured by Sportsfield Specialties, Inc.
   2. COMPONENTS:
      a. 3 inch thick high-impact Polyurethane Foam
      b. 2'-8 inches tall and 44 feet long.
      c. 5/8 inch Square Edge AdvanTech Water Resistant Sheathing Panel, All Sides Stained and Sealed with Exterior Grade Finish.
      d. 18 oz. Per Square Yard EcoGuard Extruded Vinyl.
         1) Manufactured Using 33 percent Reprocessed Vinyl, High UV Resistance and Five (5) Year Limited Fade Warranty, Various Standard Colors Available.
      e. Fabric: 1000 Denier Polyester Basic Fabric.
      f. Tear Strength Test: Warp 78 lbs., Fill 65 lbs.
      g. Tensile Strength: Warp 224 lbs., Fill 220 lbs.
      h. Weft Insertion: 9 x 9, Superior UV Inhibitors.
      i. Cold Crack: Minus 20 degrees Fahrenheit.
      j. Vinyl Seams Double Stitched Using 6 lb. Bonded Polyester Black Thread.
      k. Stainless Steel Assembly Hardware.
      l. Z-Clip Attachment.
      m. Along three walls between dugouts.
      n. Provide Custom Lettering "SPARTAINS" on middle wall.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verification of Conditions: Verify that fields and track are ready for installation.

3.02 INSTALLATION

A. All athletic equipment shall be installed as recommended by manufacturer and as indicated on drawings.

3.03 CLOSEOUT ACTIVITIES

A. See Section 01 7900 - Demonstration and Training, for additional requirements.
B. Demonstration: Demonstrate operation of equipment to Owner's personnel.
   1. Use operation and maintenance data as reference during demonstration.
   2. Conduct walking tour of project.
   3. Briefly describe function, operation, and maintenance of each component.

3.04 PROTECTION

A. Protect installed equipment from subsequent construction operations.

END OF SECTION 11 6833

This page intentionally left blank

SECTION 11 6844

EXTERIOR ELECTRONIC SOFTBALL SCOREBOARDS

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes: Installation of existing exterior electronic softball scoreboard and wireless controller on new structural steel supports, new concrete footings.
B. Do not include sales tax, refer to Section 00 1115 - Advertisement for Prequalification of Bidders.

1.02 REFERENCES

A. ASTM B221 - Aluminum-Alloy Extruded Bar, Rod, Wire, Shape, and Tube.
B. ASTM A6 - Steel Shapes
C. National Electrical Code (NEC).
D. Federal Communications Commission, Part 15 Rules & Regulations, EN60950-1, EN55022 & EN55024.
E. UL and C-UL Standard for Electric Signs

1.03 SUMMARY OF WORK

A. Provide the following:
    1. Install and connect existing scoreboard and wireless control center.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. Existing Sign: Model LX1620 by Electro-Mech Scoreboard Company.

2.02 SCOREBOARD

A. Type: Exterior, electronic baseball scoreboard with LED displays for runs, hits, errors, balls, strikes, outs and innings.
    1. Existing Model LX1620 by Electro-Mech.
        a. Size: 18 feet long by 6 feet high by 6 inches deep.
        b. Approximate weight: 350 pounds.
        c. Power requirement: 120 volts, 3.2 amps, with all options included. A local NEMA 3R disconnect shall be provided.

2.03 CONTROL CENTER

A. Existing Type: Wireless microprocessor based operator's control center.

PART 3 - EXECUTION

3.01 PREPARATION

A. Verify exact scoreboard and control center quantities and junction box locations with the Owner.
B. Coordinate requirements for electrical power, concrete, steel erection, auxiliary framing and supports, suspension cables, and other components to ensure adequate provisions are made for complete, functional installation of scoreboards.

C. Coordinate scoreboard electrical requirements to ensure proper power source, conduit, wiring, and boxes are provided. Prior to installation, verify type and location of power supply.

3.02 INSTALLATION

A. Install scoreboards and accessories in accordance with manufacturer's instructions and approved installation drawings.
B. Provide a complete electrical installation including conduit, conductors, junction boxes, supports, terminations, etc. in compliance with the most recently adopted version of the National Electrical Code (NEC). Electrical branch circuiting to sign is required to conform to NEC voltage drop recommendations. All conduit shall be EMT with compression fittings. Conductors shall be THWN CU. A green equipment ground conductor shall be provided with the branch circuit.
C. Before installation, field test scoreboards and accessories for operating functions. Ensure that scoreboards accurately perform all operations. Correct deficiencies.
D. Rigidly mount scoreboards and accessories level and plumb with brackets and fasteners.
E. Clean exposed surfaces.
F. Protect scoreboards and finishes from other construction operations.

END OF SECTION 11 6844

SECTION 11 7910

CHANGING TABLE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Furnish all labor, materials, equipment, tools and services required to fully complete all Changing Table work as is indicated on the drawings and/or specified herein including, but not limited to, the following described items.
   1. Changing table - height adjustable

1.02 RELATED SECTIONS

A. Section 06 1000 - Rough Carpentry, for wood blocking.
B. Section 09 2117 - Non-Structural Metal Framing, for anchoring of table.
C. Division 22 - Plumbing for drain hose assembly connection.
D. Division 26 - Electrical for power.

1.03 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Product data including manufacturer’s product specifications and standard details.
C. Manufacturer's operation and maintenance instructions

1.04 WARRANTY

A. The changing table warranty covers all product components for manufacturing defects for a period of three (3) years from the date substantial completion. A parts repair/labor warranty is in effect for a period of one (1) year from the invoice date.
   1. These warranties do not cover product defects related to improper product assembly or installation, components which have been damaged due to improper user procedure, lack of recommended maintenance, improper cleaning or parts lost after product delivery.
   2. Guarantee shall be on form included in Section 01 7800.

PART 2 PRODUCTS

2.01 CHANGING TABLE

A. Basis-of-Design Product: Provide Pressalit Care Model R8539 Padded Folding Adult Changing Table with integrated safety side rail and optional drain hose, as distributed by Max-Ability; www.max-ability.com, 1-800-577-1555

2.02 MATERIALS

A. Changing Table: Heavy duty aluminum frame with removable durable 3-piece polyurethane foam mattress. Powder-lacquered stainless steel mounting bracket and anchors. Wall mounted table, folds up to wall with pneumatic counterbalance.
   1. Length: 75.25 inches.
   2. Width: 31 inch.
   3. Adjustable Working Height: 12 inches - 38 inches with safety stop.
   4. Weight capacity: 440 lbs.
B. Integrated Safety Side Rail: Built-in, hinged operation. Dual safety locks in up position.

PART 3 EXECUTION

3.01 INSTALLATION

A. Preparation:
   1. Coordinate installation with work of other trades. Provide solid blocking for anchoring of table to wall.

B. Installation:
   1. Install in accordance with manufacturer's instructions. Comply with instructions for secure attachment, proper relation to adjacent finished surfaces and proper operation.
   2. Locate changing table as shown on drawings.
   3. Mount hand control in location as shown on drawings.

END OF SECTION 11 7910 11 7910

SECTION 12 3556

MUSIC EDUCATION STORAGE CASEWORK

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Acoustically Enhanced Music Instrument Storage Casework.

B. Sheet Music Storage Casework.

1.2 RELATED SECTIONS

A. Division 01 Section "Special Project Procedures for Music Education Facilities" for coordinating installation of related products.

B. Division 06 Section "Rough Carpentry" for blocking in frame walls required to anchor casework.

C. Division 09 Section "Non-Structural Metal Framing" for reinforcements in metal-framed partitions required to anchor casework.

D. Division 09 Section "Resilient Base and Accessories" for finish base materials applied to casework.

E. Division 12 Section "Manufactured Wood Casework" for standard institutional casework.

1.3 REFERENCES

A. American National Standards Institute (ANSI):
   1. ANSI A208.1 – Particleboard.

B. American Society of Civil Engineers (ASCE):
   1. ASCE 7 – Minimum Design Loads for Buildings and Other Structures.

C. ASTM International (ASTM):
   1. ASTM C 423 – Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method.
   2. ASTM E 488 – Standard Test Methods for Strength of Anchors in Concrete and Masonry Elements.
   3. ASTM E 795 – Standard Practices for Mounting Test Specimens During Sound Absorption Tests.

D. Audio Engineering Society (AES):
   1. AES-4id – AES information document for room acoustics and sound reinforcement systems -- Characterization and measurement of surface scattering uniformity.

E. Builders Hardware Manufacturers Association (BHMA):
   1. ANSI/BHMA A156.9 – Cabinet Hardware.

F. National Electrical Manufacturers Association (NEMA):
   1. NEMA LD 3 – High Pressure Decorative Laminates.

G. U.S. Department of Commerce, National Institute of Standards and Technology (NIST):
   1. DOC PS 1 – U.S. Product Standard for Construction and Industrial Plywood.

1.4 SYSTEM DESCRIPTION

A. Modular instrument storage casework with integral bases, adjustable levelers, and through-bolted fastening, enabling owner reconfiguration of unit layout.
   1. Acoustically enhanced instrument storage casework finished with interior lining of sound-absorbent material providing sound absorption and noise reduction properties.

B. Sheet music storage casework in wheeled retractable units providing high-density storage, adjustable to fit most sizes of published sheet music, enabling owner reconfiguration of unit layout.

1.5 PERFORMANCE REQUIREMENTS

A. Acoustically Enhanced Music Instrument Storage Casework Acoustic Properties:
   1. Sound Absorption Average: Minimum SAA of 0.80, based upon sound absorption coefficient for twelve one-third octave bands from 200 to 2500 Hz, inclusive, with a minimum Noise Reduction Coefficient (NRC) of 0.75, per ASTM C 423 and ASTM E 795.
   2. Acoustical Performance, One-third Octave Band Center Frequency, Hz, for four: 27 by 84 by 29 inch deep (606 by 2134 by 737 mm deep) units:

	125	250	500	1000	2000	4000
Sound Absorption Coefficient						
Mounting Type F65	1.08	0.71	0.86	0.77	0.75	0.68
Sound Absorption, sabins/unit						
Mounting Type F65	68.72	45.25	55.00	48.83	47.85	43.45
Scattering Coefficient						
	0.10	0.13	0.40	0.62	0.80	1.44

B. Storage Casework Component Load Capacities:
   1. Storage Casework Wire-Grille Door Hinge: Each weld capable of resisting 400 lbf (1779 N) pull test without visible damage or permanent deformation.
   2. Sheet Music Storage Casework: Units shall support 35 lb/lin. ft. (52 kg/m) uniform shelf loading with maximum 1/16 inch (1.6 mm) deflection.

C. **Seismic Performance**: Comply with ASCE 7, "Minimum Design Loads for Buildings and Other Structures": Section 9, "Earthquake Loads" based upon seismic design criteria indicated.

1.6 SUBMITTALS

A. Product Data: Manufacturer’s data sheets, installation instructions, and maintenance recommendations.

B. Product Test Reports: Indicating compliance of products with requirements, from a qualified independent testing agency.

C. Shop Drawings: Prepared by manufacturer. Include elevations showing casework components, details of each condition of installation, and types and locations of hardware and fasteners. Show fabrication and installation details. Include plans, elevations, sections, details, and attachments to other Work.
   1. **Indicate seismic bracing and fastening requirements.**

D. Samples: For each color and finish for each exposed casework component.

E. Operation and Maintenance Data.

F. Warranty: Submit sample meeting warranty requirements of this Section.

1.7 QUALITY ASSURANCE

A. Manufacturer Qualifications: Approved manufacturer listed in this section, with minimum 5 years experience in manufacture of similar products in use in similar environments. Obtain music education storage casework through one source from a single approved manufacturer.

1. Approval of Comparable Products: Submit the following in accordance with project substitution requirements, within time period allowed for substitution review:
   a. Product data, including certified independent test data indicating compliance with requirements.
   b. Samples of each type of product specified, including but not limited to the following:
      1) Door and casework panels.
      2) Waterfall Grille doors.
      3) Hinges with through-bolting hardware. (Traditional screw method will not be accepted)
      4) Latches with through-bolting hardware.(Traditional screw method will not be accepted.)
   c. Project references: minimum of 5 installations not less than 5 years old, with owner contact information.
   d. List of successful installations of similar products available for evaluation by Architect.
   e. Sample warranty.
2. Submit substitution request not less than 15 days prior to bid date. Substitutions following award of contract are not allowed except as stipulated in Division 01 General Requirements.
3. Approved manufacturers must meet separate requirements of Submittals Article.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, and handle music education storage casework in accordance with manufacturer's recommendations. Ship to jobsite only after roughing-in, painting work, and other related finish work has been completed and installation areas are ready to accept casework and recommended temperature and humidity levels will be maintained during the remainder of construction.

1.9 COORDINATION

A. Coordinate installation of blocking and supports in frame wall assemblies under work of other sections where required for anchoring of music education storage casework.

1.10 WARRANTY

A. Special Warranty: Manufacturer's written warranty indicating manufacturer's intent to repair or replace components of music education storage casework that fail in materials or workmanship within 10 years from date of Substantial Completion. Failures are defined to include, but are not limited to, the following:
   1. Fracturing or breaking of casework components including doors, panels, shelves, or hardware resulting from normal wear and tear and normal use other than vandalism.
   2. Delamination or other failures of glue bond of components.
   3. Warping of casework components not resulting from leaks, flooding, or other uncontrolled moisture or humidity.
   4. Failure of operating hardware.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Basis of Design: Music education storage casework design is based upon products of the manufacturer listed below. Provide basis of design product or approved comparable product. Comply with requirements of Part 1 Quality Assurance Article for approval of products not named below.
   1. Wenger Corporation, Owatonna, MN; Telephone(800)4WENGER (800-493-6437)

B. Other Acceptable Manufacturers:

1. Ironwood Manufacturing: www.ironwoodmfg.com.

2. Randal Instrument Storage: www.randaldisplays.com.

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

2.2 MATERIALS

A. **Materials Meeting Sustainable Design Requirements**:
1. **Formaldehyde-free Products**: Provide music education storage casework made with composite products and adhesives with no urea formaldehyde added.

B. **Particleboard**: ANSI A208.1, minimum 43 lb/cu. ft. (689 kg/cu. m) density, **composite products and adhesives ,** with no urea formaldehyde added.

C. Softwood Plywood: DOC PS-1.

D. Particleboard Thermoset Panels: Particleboard finished with thermally-fused polyester surfacing on both sides meeting performance properties of NEMA LD 3 for VGS grade, edge-banded, including the following:
1. Surface Abrasion Resistance: Taber Wheel, 400 cycles, for solid colors.

E. Plywood Thermoset Panels: Plywood finished with thermally-fused polyester surfacing on both sides meeting performance requirements of NEMA LD 3 for VGS grade, edge-banded, including the following:
1. Surface Abrasion Resistance: Taber Wheel, 400 cycles, for solid colors.

F. Polyethylene Shelves: High-density, one-piece, blow-molded or formed, with radiused front edge, for abuse-resistant shelves.

G. PVC Edge Banding: Radiused PVC extrusions, 3 mm thick.

2.3 INSTRUMENT STORAGE CASEWORK

A. General: Provide through-ventilating instrument storage casework meeting requirements in System Description and Performance Requirements Articles.

B. Side Panels and Divider Panels: Particleboard thermoset panel, 3/4 inch (19 mm) thick. Side panels machined to accept unit-to-unit through-bolting.

C. Grille Doors: 5/16 and 1/4 inch (7.9 and 6.3 mm) diameter for AcoustiCabinets, with full 360 degree welds at T-joints.
1. Provide for **Instrument Storage Casework**.
2. Provide for I**nstrument Storage Casework, compartment height**.

D. Panel Edge Banding: 3 mm thick, heat-bonded, with beveled and profiled edges and corners.

E. Shelving: Sized with adequate gap between shelving and casework side panels to allow air movement inside casework.
1. Up to 27 inches (686 mm) wide: Removable molded polyethylene shelf, with impact-resistant, radiused front edge, mounted to cabinet wall with self-locking clip.
2. Over 27 inches (686 mm) wide: For large instrument casework: Removable formed polyethylene shelf, ribbed, with high-impact-resistant, radiused front edge, supported by steel tube frame.
3. Corner cabinet revolving shelving: 0.053 inch (1.3 mm) min. thickness steel sheet bolted to revolving steel center post, with radiused hardboard deflector panel.

F. Casework Panel Color: As selected by Architect from manufacturer's standard colors.

2.4 SHEET MUSIC STORAGE CASEWORK

A. General: Provide sheet music storage casework meeting requirements in System Description and Performance Requirements Articles.

B. End Panels: Particleboard thermoset panel, 3/4 inch (19 mm) thick.

C. Shelving: Plywood thermoset panel, 3/4 inch (19 mm) thick. 7-shelf unit with 4 adjustable and 3 fixed shelves, with metal book supports.

D. Exposed End Cover Panels: Particleboard thermoset panel, 3/4 inch (19 mm) thick.

E. **Top Closure/Storage Panels**: Plywood thermoset panel matching end panels.

F. Casters: 4 rigid 8 inch (203 mm) diameter casters.

G. Guide Frame: 1 by 1 inch by 16 gauge/0.053 inch (25.4 by 25.4 by 1.3 mm) steel tubes, factory finished, with limiting cable, bumpers, and hat channel wall anchor.

H. Casework Panel Color: As selected by Architect from manufacturer's standard colors.

2.5 ACCESSORIES

A. Filler Panels and Closure Kits: 3/4 inch (19 mm) thick particleboard thermoset panels matching cabinet side panels. Provide the following, cut to fit field conditions, where indicated:
1. Wall filler between cabinet side and wall.
2. Top filler between cabinet top and wall.
3. Top of cabinet closure panel between cabinet and finished ceiling or soffits.
4. Finished back panel for exposed cabinet backs.

2.6 HARDWARE

A. Butt Hinges: 2-3/4 inch (70 mm), 5-knuckle steel hinges made from 0.090 inch (2.29 mm) thick metal, ANSI/BHMA A156.9, Grade 1, with powder-coated finish, through-bolted to door and side panels **and welded to grille door frames**. Provide 2 hinges on compartment doors. Traditional screw method of attachment will not be accepted.

B. Slide Latch: 0.105 inch (2.67 mm) min. thickness steel, with padlock eye, powder-coat finish, through-bolted to panel door and side panel **and welded to grille door frames**. Latches securely without padlock. Provide with clear plastic label holder with numbering system. Padlocks furnished by Owner.

C. Panel Connectors: 1/4–20 by 1.77 inch (45 mm) panel connectors, with steel thread inserts, powder coated to match panels.

D. Cabinet Levelers: Leveling glides with 3/8 inch (9.5 mm) diameter threaded steel rod in steel corner brackets, minimum two each per cabinet side, accessible from within unit, and concealed in completed installation.

E. Fasteners: Manufacturer-recommended fasteners as required for casework substrate and project performance requirements, consisting of one or more of the following:
1. Sheet Metal Screws: SAE J78, corrosion-resistant-coated, self-drilling, self-tapping steel drill screws.
2. Wood Screws: ASME B18.6.1.
3. Expansion Anchors in Concrete and Concrete Masonry Units: Carbon-steel, zinc plated.

2.7 FINISHES

A. Steel Sheet, Steel Wire, and Exposed Fasteners: Urethane-based electrostatic powder coating, color as indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine casework installation areas for compliance with requirements for installation tolerances, location of blocking and other anchoring reinforcements, and other existing conditions affecting installation and performance of casework. Proceed with casework installation upon correction of unsatisfactory conditions.

3.2 CASEWORK INSTALLATION

A. Install plumb, level, and true; using integral levelers. Install in accordance with manufacturer's recommendations and approved submittals.
   1. **Install seismic bracing and fastening in accordance with approved shop drawings.**

B. Install hardware uniformly and precisely. Set hinges snug and flat. Adjust and align hardware so moving parts operate freely and contact points meet accurately. Allow for final adjustment after installation.

C. Adjust casework and hardware so doors and drawers operate smoothly without warp or bind and close with uniform reveals.

3.3 CLEANING AND PROTECTING

A. Repair or replace defective work as directed by Architect upon inspection.

B. Clean casework surfaces. Touch up, refinish, or replace damaged components in a manner acceptable to Architect.

C. Turn over operation and maintenance instructions to Owner.

END OF SECTION

SECTION 12 6100

FIXED AUDIENCE SEATING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Furnish all labor, materials, equipment, tools and services required to fully complete all fixed audience seating work as is indicated on the drawings or specified herein including, but not limited to, the following described items.
B. Fixed, upholstered chairs with self-rising seat mechanisms, aisle and intermediate standards.
C. Do not include sales tax, refer to Section 00 0104 - Notice to Contractors.

1.02 REFERENCE STANDARDS

A. ANSI A208.2 - Medium Density Fiberboard (MDF) for Interior Applications; 2016.
B. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2020, with Errata (2021).
C. AWS D1.2/D1.2M - Structural Welding Code - Aluminum; 2014, with Errata (2020).
D. HPVA HP-1 - American National Standard for Hardwood and Decorative Plywood; 2016.
E. NEMA LD 3 - High-Pressure Decorative Laminates; 2005.
F. NFPA 261 - Standard Method of Test for Determining Resistance of Mock-Up Upholstered Furniture Material Assemblies to Ignition by Smoldering Cigarettes; 2018.
G. PS 1 - Structural Plywood; 2009 (Revised 2019).
H. AA ADM-1 - Aluminum Design Manual; 2005.
I. ASTM A 513 - Standard Specification for Electric-Resistance-Welded Carbon and Alloy Steel Mechanical Tubing; 2006b.
J. ASTM A 607 - Standard Specification for Steel, Sheet and Strip, High-Strength, Low-Alloy, Columbium or Vanadium, or Both, Hot-Rolled and Cold-Rolled; 1998.
K. ASTM D 3574 - Standard Test Methods for Flexible Cellular Materials--Slab, Bonded, and Molded Urethane Foams; 2005.
L. ASTM D 3597 - Standard Specification for Woven Upholstery Fabrics--Plain, Tufted, or Flocked; 2002 (Reapproved 2008).
M. ASTM E 1352 - Standard Test Methods for Cigarette Ignition Resistance of Mock-Up Upholstered Furniture Assemblies; 2008a.
N. ASTM E 1537 - Standard Test Method for Fire Testing of Upholstered Furniture; 2007.
O. AWS D1.3 - Structural Welding Code - Sheet Steel; 2007.
P. ASTM D 3574 - Standard Test Methods for Flexible Cellular Materials--Slab, Bonded, and Molded Urethane Foams; 2005.

1.03 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, chair layouts and dimensions and seat numbering scheme.
    1. Field Measurements: New chairs to be layed out and installed in existing auditorium, manufacturer to field verify all dimensions, slope of floor, etc. to fully complete installation on a one to one basis allowing for required ADA locations per current code.
D. Selection Samples: Manufacturer's color charts and swatches for fabric upholstery, indicating full range of materials, colors, and patterns available.
E. Maintenance Materials:
    1. See Section 01 6000 - Product Requirements, for additional provisions.

2. Extra Seats: Quantity equal to 5 percent of total installed, but not less than one of each type and width of seat, furnished from same production run as that installed.
3. Extra Armrests: Quantity equal to 5 percent of total installed, furnished from same production run as that installed.
4. Extra Fabric: Quantity sufficient for reupholstering 5 percent of installed seating.

F. Warranty: Manufacturers standard five-year warranty documents.

1.04 QUALITY ASSURANCE

A. Manufacturer Qualifications: Manufacturer who has 10 years of experience manufacturing spectator seating equipment.
B. Installer Qualifications: An experienced installer certified in writing by the seating manufacturer to be qualified for installation of specified seating.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Deliver seats to project site in unopened containers clearly labeled with manufacturer's name and identification of contents.
B. Store seating units in dry and clean location until needed for installation. During installation, handle in a manner that will prevent marring and soiling of finished surfaces.

1.06 MOCK-UP

A. See Section 01 4000 - Quality Requirements, for additional mock-up requirements.
B. Construct mock-up with at least 2 seats in each of 2 rows at location indicated. Approved mock-up will serve as quality standard for completed installation. Approved mock-up may remain as part of the Work.

1.07 WARRANTY

A. Manufacturer's Product Warranty: Submit manufacturer's standard warranty form for fixed upholstered chairs. This warranty is in addition to, and not a limitation of other rights Owner may have under Contract Documents.
   1. Warranty Period: Five years from Date of Substantial Completion.
   2. Beneficiary: Issue warranty in legal name of project Owner.
   3. Warranty Acceptance: Owner is sole authority who will determine acceptance of warranty documents

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Basis of Design Manufacturer: Hussey Seating Company: www.husseyseating.com.
   1. Product: Hussey Quattro Chair System
      a. Model: QUATTRO
      b. Back Foam: 2 inches.
      c. Seat Type: Standard Upholstery.
      d. Armrest Type: Solid Hardwood.
      e. Standards: Cast Aluminum (or Cast Iron).
      f. Chair Mount: Floor Mount.
   2. Product Accessories: Seat Numbers, Row Letters, and ADA Easy Access Standards.
B. Other Acceptable Manufacturers:
   1. American Seating Inc.; Product - "Steller Series": www.americanseating.com.
   2. Irwin Seating Company; Product - "Citation Series": www.irwinseating.com.
   3. Substitutions: See Section 01 6000 - Product Requirements.

a. The Owner shall have the option of waiving minor technical variations of other manufacturers as a part of reviewing and awarding contract.

2.02 MANUFACTURER'S SYSTEM ENGINEERING DESCRIPTION

A. Structural Performance: Engineer, fabricate and install fixed audience seating to the following structural loads without exceeding allowable design working stresses of materials involved, including anchors and connection. Apply each load to produce maximum stress in each respective component of each audience seat unit.

B. Manufacturer's System Design Criteria:

1. Seats and Backs:
   a. Shall embody a timeless sculptured appearance to harmonize with any architectural form or room decor.
   b. Shall exhibit moderate compound contours for supportive comfort avoiding excess anatomical pressures.
   c. Seat shall be semi-cantilevered, self-centering, automatic three-quarter lift with over center retract feature, for ease of passage and janitorial access.
   d. Seat shall be tested and professionally certified through an independent testing laboratory to support and withstand an evenly distributed 600 lb. (272 Kg) static load without failure or irregularities that would impair usefulness.
   e. Self-lifting seat shall be tested and professionally certified through an independent testing laboratory to withstand 350,000 operating cycles without failure of seat mechanism or measurable component wear.
   f. Seat shall be tested and professionally certified to withstand 10,000 impacts of a 40 lb. (18 Kg) sandbag dropped on the center of the seat from each of the following heights: 6 inches, 8 inches, 10 inches, and 12 inches. The rate of impacts shall be approximately 18 per minute with the total quantity of impacts equaling 40,000.
   g. Back shall withstand an evenly distributed front or rear static load of 450 lbs (205 Kg).
   h. Back shall be tested and professionally certified to withstand, without failure, 40,000 swinging impacts each to the front and rear of the back by means of two opposing 40 lb (18 Kg) sandbags. The sandbags shall be moved horizontally and equally for 10,000 cycles each at the following distances of 6 inches, 8 inches, 10 inches, and 12 inches at a rate of 35 cycles per minute.
   i. Back shall withstand, without failure, an evenly distributed Horizontal Traverse Static Load of 200 lbs (90.70Kg). The load shall be applied to the top of the back at a 45-degree angle to the row of seats.
   j. Armrests shall be tested and professionally certified to withstand, without failure, a 200 lb (91 Kg) static load applied both perpendicular to and vertically down on the arm.
2. Materials (Flammability) shall satisfy applicable test, codes, standards, or requirements as follows:
   a. Copolymer polypropylene shall have a burn rate of 1 inch or less per ASTM 635.
   b. Upholstery materials shall meet requirements as set forth in the state of California Bureau of Home Furnishings Technical Bulletin 117.
   c. Fire-performance Characteristics of Seat Padding: Provide seating that complies with test method: California Technical Bulletin 117
   d. Cushioning and padding shall be self-extinguishing as defined in the requirements as set forth in the State of California Bureau of Home Furnishings Technical Bulletin 117.

2.03 MATERIALS

A. Cast Aluminum: Alloy A380 (ANSI/AA A380.0).

B. Cast Iron: ASTM A 48/A 48M, Class 25A minimum, free of air holes and casting imperfections, all edges ground smooth.
C. Steel Tubing: ASTM A 513.
D. Steel Sheet/Coil: ASTM A 607.
E. Mechanical or Adhesive Concrete Anchors: SAE grade 2
F. Exposed Hardwood Lumber: Wood Species: Northern Hard Maple.
G. Concealed Plywood: Engineered Wood Association PS1-95 2000: Poplar
H. Medium Density Fiberboard: ANSI A208-2-1986
I. Plastic Laminate: NEMA LD3.1-1985, GP 48
J. Polyurethane Foam Padding: ASTM D-3574
K. Fabric: 100% Marquesa Lana continuous filament Olefin in the following standard selections:
    1. Fabric shall have 13 fill picks per inch, 13 warp ends per inch, weighing 16 oz. 454grams per linear yard including backing.
    2. Molded plastic: Injection Molded copolymer polypropylene or nylon 6/6.

2.04 DESIGN AND CONCEPT

A. Auditorium chairs shall be designed to exhibit a modern appearance that will enhance any auditoriums decor. Seats, backs, and standards shall complement each other without the need for end panels or other adornments. Superior comfort will be derived through careful ergonomic engineering, selection of materials, and design of supportive structures.

2.05 FABRICATION

A. Upholstered Gravity Fold/Spring Assist Seats:
    1. The seat assembly shall consist of a stylish padded and upholstered top surface, a polypropylene bottom shell with dual contours, and a lifting mechanism with spring assist. Seat shall have the ability to achieve a full fold position when rearward pressure is applied. Superior comfort shall be derived through careful ergonomic engineering.
    2. Upholstery Pad: The upholstered seat topper shall consist of a 5/8 inch thick formed ply form base with contoured molded polyurethane foam padding and fabric upholstered cover. Seat padding shall be properly contoured to support the body without causing discomfort. The upholstered seat cover shall exhibit a high degree of tailoring and will be affixed to the base with upholstery staples.
    3. Spring Assist Seat Mechanism: Seat lifting mechanism shall be a dual function coated lifting springs to provide whisper quiet fail-safe operation. The seat structure shall rotate on a 3/4 inch spanner bar to eliminate binding due to irregular floor conditions. Seat shall be certified to withstand 350,000 lifting cycles and a 600 lb static load without failure.
    4. Standard Bottom Cover: Seat shell/bottom shall be constructed of polypropylene plastic to provide a durable yet aesthetic design. The cover shall protect the mechanical parts of the lifting hinge and upholstered seat topper. The shell / bottom shape shall compliment the overall design of the chair.
B. S3 Soft Square Low (33 inch) Upholstered Backs:
    1. Soft Square 33 inch upholstered backs shall be upholstered and padded with a decorative outer panel. The top corners of the back are conically shaped sections for stylish looks and a timeless appearance. The back shall be compound contoured and will conform to the proper posture of a seated individual. Overall back height is 33 inches above the floor allowing proper shoulder support of the chair occupant. The 29 inch out panel extends below the seat pan to protect the occupant from the rear.

2. The inner upholstered panel shall be 5/8 inch 9 ply thick-formed hardwood with an ergonomically engineered contour. The wings for attachment of chair back to standard shall be not less than 14 ga (1.9mm) and will be attached via concealed fasteners. Wings shall position the chair back at one of three positions: 15, 18, or 21 degrees. There shall be no exposed fasteners above the chair landing bracket. Chair back upholstery shall exhibit a high degree of workmanship and customization.
3. The outer back panel shall be constructed of polypropylene plastic. The panel shall be no less than 29 inches in length and will protect the rear of the upholstered inner panel as well as the chair occupant.
4. Back Cover Tailoring: Quilted.

C. Cast Aluminum (or Cast Iron) Standards:
1. Standards shall be die cast Aluminum AA380 grade or Cast Iron class 25A minimum.
2. Cast Standards shall be an integral aesthetic part of the chairs appearance and do not require the use of end panels.

D. Seat Hinges:
1. Spring Assist Seat hinges shall be fully contained within the seat pan and fitted with a pair of independent, permanently lubricated bearings.
2. Each of the independent seat hinges shall be fitted with double acting; self-centering, pre-loaded coiled seat return springs.
3. Seat hinge and spring installation shall be designed not to require periodic adjustment or lubrication.

E. Finish:
1. Aluminum (or Cast Iron) Components: Material shall be pre-treated in an iron phosphate wash system prior to finish application. Finish shall be an electrostatically sprayed high solids enamel to yield a minimum dry film thickness of 1.5 mils. Enamel shall be baked 15 minutes in a 300 degree oven.
2. Injection molded polypropylene or nylon: Shall be pigmented, in one of manufacturers standard colors and have a textured surface.
3. Fabric: Upholstery material shall be 100 percent Marquesa Lana continuous filament Olefin yarn with one of manufacturer's standard fabric offerings.
4. Color: Shall be per manufacturer's standards. Seating Contractor shall submit color samples for owner's approval prior to manufacture.
5. Armrests, Stained Hardwood: Armrests shall be Northern Hard Maple solid hardwood without defects. All edges shall be eased for comfort. Armrest finish shall consist of a single coat of waterbase stain, followed by a sealer coat, scuff sanding, and a waterbase clear topcoat. Stain shall be selected from manufacturer's standard offerings. Armrest to be secured to standard with concealed fasteners.

2.06 FASTENINGS

A. Chair Assembly
1. All welds shall be made at the factory by welders that are certified on the equipment and process used.
2. All structural connections shall be made with S.A.E. stress rated zinc plated or, black oxide steel bolts, washers and nuts.

B. Concrete Floor Attachment
1. Chair stanchions shall each be attached by means of two 1/4 inch expansion bolts set in holes drilled to a depth of not less than 1 3/4 inch in the concrete.
2. Expansion bolts shall be of approved type lead drive anchor comprised of the following components:
   a. Bolt - 1/4 inch x 3 inch expansion anchor.

b. Sleeve - 1/4 inch I.D. x 1 inch lead (commercially known as 2 percent antimony lead) with one end recessed to fit cone. One sleeve per bolt.
c. Cone - Cast hard metal and steel setting washer. One setting washer per bolt.
d. Standard to be placed on the bolts. Standards to be permanently secured with a flat washer, lock washer and nut.

2.07 ACCESSORIES:

A. Armrest, Easy Access: Armrest shall hinge on end standards to allow easy access for disabled patrons. Swing-up end arms shall be provided for one percent of fixed seating capacity to meet the Americans with Disabilities Act (ADA). Each accessible chair shall include the universal handicap symbol on the end aisle standard for clear identification.
B. Standard Chair Numbers: Black text with gray background on a 23/32 inch x 2-7/32 inches elliptical Lexan plate. Plate fitted in a vandal resistant recess located in rear of armrest and secured with adhesive.
C. Standard Row Letters: Black text with gray background on a 23/32 inch x 2-7/32 inches elliptical Lexan plate. Plate fitted in a vandal resistant recess located in rear of armrest and secured with adhesive.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine substrates for conditions detrimental to installation of fixed theater seating. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION

A. Comply with manufacturer's instructions for installation and approved shop drawings.
B. Install fixed upholstered chair system in accordance with manufacturer's installation instructions and final shop drawings. Provide accessories, anchors, fasteners, inserts and other items for installation of seating and for permanent attachment to adjoining construction.

3.03 ADJUSTING AND CLEANING

A. Adjust seat mechanisms to ensure that seats in each row are aligned when unoccupied.
B. Repair minor abrasions and imperfections in painted finishes with a coating that matches factory-applied finish; replace units that cannot be repaired to unblemished appearance.
C. Replace upholstery fabric damaged or soiled during installation.
D. Clean work area and remove debris form site.

3.04 PROTECTION

A. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and installer to ensure audience seats are without damage or deterioration at time of substantial completion.

END OF SECTION 12 6100

SECTION 12 6613

BLEACHER SEATS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Furnish all labor, materials, equipment, tools and services required to fully complete all Telescoping Bleacher work as is indicated on the drawings and/or specified herein including, but not limited to, the following described items.
B. Plastic seats installed on concrete risers
C. Do not include sales tax, refer to Section 00 1115 - Advertisement for Prequalification of Bidders.

1.02 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 handling and requirements.
   3. Material descriptions
   4. Dimensions of individual components and profiles
   5. Finishes for telescoping bleachers.
   6. Installation methods.
C. Shop Drawings: Complete layout with dimensions, seat heights, row spacing and rise, aisle widths and locations, points of connection to substrate, assembly dimensions, and material types and finishes.
   1. Provide drawings customized to this project.
   2. Include Professional Engineer certification.
   3. Graphics Layout Drawings: Indicate pattern of contrasting seat colors.
D. Selection Samples: For each material for which color selection is required, submit samples, 2 by 2 inches in size, illustrating colors and finishes available.
E. Samples for Verification: For each type of exposed finish required, prepared on Samples of size indicated below.
   1. Seating: 3-inch- (75-mm-) square sample of each seating material, color, and finish indicated.
F. Qualification Data: For Installer.
G. Operation and Maintenance Data: Manufacturer's operation and maintenance instructions, including annual inspection and maintenance and bi-annual inspection by a Professional Engineer or manufacturer factory service personnel.
H. Warranty: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

1.03 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than 10 years of documented experience.
B. Safety Standard: Provide telescoping bleachers that comply with requirements in seating layout to conform to ICC (IBC).
C. All bleachers shall comply with ICC 300.

D. Installer Qualifications: Engage experienced installer who has specialized in installation of seating types similar to types required for this project and who is acceptable to or certified by seating manufacturer.

1.04 PROJECT CONDITIONS

A. Field Measurements: Verify actual locations of walls, columns, and other construction that will interface with telescoping bleachers by field measurements before fabrication and indicate measurements on Shop Drawings.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Store, in original packaging, under cover and elevated above grade.

1.06 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. Replace parts that fail under normal use at no extra charge to Owner.
C. The Contractor shall guarantee this work for a period of One (1) years from date of Substantial Completion. Guarantee shall be on form included in Section 01 7800.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Basis of Design Manufacturer: :
   1. Hussey Seating Company; Maxam 26: www.husseyseating.com.
B. Other Approved Manufacturers:
   1. Irwin Telescopic Seating Company: www.irwintelescopicseating.com.
   2. Hussey Seating Company: www.husseyseating.com.
   3. Interkal Telescoping Bleachers. www.interkal.com
   4. Other manufacturers shall be allowed to submit as a proposed substitute **before bid time, no post-bid substitution requests will be considered**. Proposed substitute manufacturers shall furnish published literature verifying that the proposed substitution meets all requirements of the Specifications and is suitable for the intended use. The Owner and Architect will evaluate any proposed substitutions and will make the final determination as to whether or not the product is acceptable to them for this project. The Owner and Architect shall have the option of waiving minor technical variations of other manufacturers as a part of reviewing and awarding contract. Refer to Section 01 6000 - Product Requirements.

2.02 BLEACHER SEATS

A. Bench Seats:
   1. Basis-of-Design Product: Hussey Courtside Seats.
   2. Material: Molded polyethylene plastic with contour seat surface.
      a. Colors: As selected by Architect from manufacturer's 15 standard colors.
   3. Seat Height: Not less than 16 inches (406.4 mm) or more than 18 inches (457.2 mm).
      a. Seat Depth: 10 inches (254 mm).

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that field measurements are consistent with those on the shop drawings.

B. Do not begin installation until substrates have been properly prepared and area has been cleared of obstructions.
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.

3.03 INSTALLATION

A. Install in accordance with manufacturer's instructions and to comply with referenced safety standards.
B. Do not field cut or alter seats, fascia, or structural members without approval.
C. Provide manufacturer's field representative to inspect completed installation.

3.04 ADJUSTING

A. Lubricate, test, and adjust each moving assembly to ensure proper operation in compliance with manufacturer's recommendations.

3.05 CLEANING

A. Clean exposed and semi-exposed assembly surfaces.
B. Touch up finishes on damaged or soiled areas.

3.06 PROTECTION

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

END OF SECTION 12 6613

This page intentionally left blank

SECTION 12 7000

TELESCOPING SEATING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Furnish all labor, materials, equipment, tools and services required to fully complete all Little Theater Seating work as is indicated on the drawings and/or specified herein including, but not limited to, the following described work.
B. Telescoping, non-upholstered theater chairs, supports and accessories.
C. Telescoping seating platform, handrails, guardrails, and steps.
D. Do not include sales tax, refer to Section 00 0104 - Notice to Contractors.

1.02 RELATED REQUIREMENTS

A. Section 03 3000 - Cast-In-Place Concrete: Flooring support and levelness.
B. Section 12 6100 - Fixed Auditorium Seating.
C. Division 26 - Wiring Devices: Drive system.
D. Division 26 - Equipment Wiring: Connection of electric motors and controls.

1.03 REFERENCE STANDARDS

A. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2020, with Errata (2021).
B. ICC 300 - Bleachers, Folding and Telescopic Seating and Grandstands Standard; 2007.
C. NFPA 102 - Standard for Grandstands, Folding and Telescopic Seating, Tents, and Membrane Structures; 2016.
D. UL 94 - Tests for Flammability of Plastic Materials for Parts in Devices and Appliances; Current Edition, Including All Revisions.
E. ASTM A 48/A 48M - Standard Specification for Gray Iron Castings; 2008.
F. ASTM D 635 - Standard Test Method for Rate of Burning and/or Extent and Time of Burning of Plastics in a Horizontal Position; 2010.
G. ASTM F 851 - Standard Test Method for Self-Rising Seat Mechanisms; 2005.
H. AWS D1.3 - Structural Welding Code - Sheet Steel; American Welding Society; 2008.

1.04 ADMINISTRATIVE REQUIREMENTS

A. General Contractor and Installer shall coordinate with Owner to insure timely installation of seating.
B. Field Measurements: Coordinate actual dimensions of construction affecting seating installation by accurate field measurements before fabrication. Show recorded measurements on final shop drawings. Coordinate field measurements and fabrication schedule with construction progress to avoid delay of Work.

1.05 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 handling and requirements.
    3. Installation methods.
C. Shop Drawings: Complete layout with dimensions, seat heights, row spacing and rise, aisle widths and locations, points of connection to substrate, assembly dimensions, and material types and finishes.

1. Provide drawings customized to this project.
2. Provide wheel load bearing information and location chart.
3. Provide wiring diagrams indicating electrical wiring and connections.
4. Include Professional Engineer certification.

D. Selection Samples: For each material for which color selection is required, submit samples, 6 x 6 inches (150 x 150 mm) in size, illustrating colors and finishes available.

E. Verification Samples: For each custom colored finish, submit samples of actual finish or product, for verification of color selection.

F. Operation and Maintenance Data: Manufacturer's operation and maintenance instructions, including annual inspection and maintenance and bi-annual inspection by a Professional Engineer or manufacturer factory service personnel.

G. Warranty: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

1.06 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than five years of documented experience.

B. Installer Qualifications: Engage experienced installer who has specialized in installation of seating types similar to types required for this project and who is acceptable to or certified by seating manufacturer.

C. All component parts of the product are to be made under direct control of the seating supplier. Utilize testing and inspection procedures to assure uniform high quality component parts and finished product.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Deliver seating in manufacturer's packaging clearly labeled with manufacturer name and content

B. Handle seating equipment in such a manner as to prevent damage.

C. Deliver the seating at a scheduled time for installation that will not interfere with other trades operating in the building.

1.08 WARRANTY

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

B. Manufacturer's Product Warranty: Submit manufacturer's standard warranty form for telescoping seating. This warranty is in addition to, and not a limitation of other rights Owner may have under Contract Documents.

1. Period: Five years from Date of Substantial Completion.
2. Beneficiary: Issue warranty in legal name of project Owner.
3. Warranty Acceptance: Owner is sole authority who will determine acceptance of warranty documents.

PART 2 PRODUCTS

2.01 GENERAL

A. Provide a design certified by a licensed Professional Engineer licensed in Utah.

B. Design to comply with applicable requirements of NFPA 102 and requirements of code authorities having jurisdiction; where conflicts between requirements occur, comply with whichever is more stringent.

C. Manufacturer's System Design Criteria:

1. Platform seat assembly; Design to support and resist, in addition to it’s own weight, the following forces:

a. Live load of 120 lbs per linear foot (1751 N/m) on seats and decking
b. Uniformly distributed live load of not less than 100 lbs per sq. ft. (4788 N/m2) of gross horizontal projection.
c. Parallel sway load of 24 lbs. per linear foot (350 N/m) of row.
d. Perpendicular sway load of 10 lbs. per linear foot (146 N/m) of row.

2. Hand Railings, Posts and Supports: Engineered to withstand the following forces applied separately:
   a. Concentrated load of 200 lbs. (890 N) applied at any point and in any direction.
   b. Uniform load of 50 lbs. per foot (730 N/m) applied in any direction.
3. Guard Railings, Post and Supports: Engineered to withstand the following forces applied separately:
   a. Concentrated load of 200 lbs. (890 N) applied at any point and in any direction along top rail.
4. Uniform load of 50 lbs. per foot (730 N/m) applied horizontally at top rail and a simultaneous uniform load of 100 lbs. per foot (1460 N/m) applied vertically downward.

D. Performance:
   1. Gray iron shall be of a quality and strength in accordance with ASTM A 48 for Class 25 gray iron castings.
   2. Molded Plastic: All blow molded or injection molded plastic shall be made from high density polyethylene. Seat and back thickness shall be 1/8 inch thick nominal on the use surfaces.
   3. Materials (Flammability) shall satisfy applicable test, codes, standards, or requirements as follows:
      a. Copolymer polypropylene shall have a burn rate of 1 inch per minute or less per ASTM 635 and UL 94 HB.

2.02 TELESCOPING SPECTATOR SEATING

A. Manufacturers:
   1. Basis of Design Manufacturer:
      a. Hussey Seating Company; Product - "Metro Chairs": www.husseyseating.com.
B. Other acceptable Manufacturers:
   1. American Seating Company; Product - "Rally": www.americanseating.com.
   2. Irwin Seating Company; Model - "Integra": www.irwinseating.com.
C. Seating:
   1. Operation:
      a. Folding beam mounted chair system for use on telescoping platforms. When the unoccupied the seat will move automatically to a three-quarter safety fold. By pushing rearward the seat will fold vertical or passing fold for additional aisle access way clearance. Additionally, the chair back will rotate forward by spring action to allow additional passage room for both occupied and unoccupied seating. The overall front-to-back dimension of the unoccupied chair shall not exceed 12 inches in the upright position. When folded against the telescoping platform the chair does not exceed 6 inches in height.

b. For the mounting of pedestals and beams for manual chair operation, chair beams shall be attached to the telescoping platform by fabricated steel hinging pedestals. Chair beams to be minimum 1 3/4 inch square tubing in 14 gauge (0.08 inch) wall thickness. The pedestal provides a positive locking mechanism to maintain the beam mounted chairs in an upright position. Each chair beam will have two pedestals. Chairs shall be grouped on beams in up to four chairs as shown on the approved shop drawings. Raising of the chairs shall be manual rotation to the upright position. Lowering of the chairs for storage is completed by slight lifting of each chair group and rotation of each group to the platform decks.

2. Chair Assembly: Chair shall consist of plastic seats and backs mounted on 7 gauge (0.2 inch) steel hinge arms, providing quiet self-rising action. Hinge and seat return spring castings are to be cast iron construction with provisions for securely mounting to 14 gauge (0.08 inch) tubular steel beams sized to support chairs and arms at appropriate intervals.
   a. Back: Plastic backs shall be double wall 1/8 inch nominal wall thickness, 1/16 inch minimum thickness in corners 90 degrees or tighter and 3/32 inch minimum thickness.
   b. Seat: Plastic seats shall be double wall, 1/8 inch nominal wall thickness, 1/16 inch minimum thickness in corners 90 degrees or tighter and 3/32 inch minimum thickness otherwise, blow-molded polyethylene.
   c. Arm: Arm supports to be 1 inch square formed steel tubing secured to beam. The arm rest is hinged to allow the chair to lay flat against the telescoping platform. The arm rest is blow molded polyethylene plastic 8 9/16 inches long by 1 3/4 inch wide with 3/32 inch nominal wall thickness.
   d. Row and Seat Identification Plates: Plates shall be lightly brushed aluminum with etched and black enamel filled characters. Plates for the chair identification mount to the leading edge of the seat. Plates for the identification of the row attach to beam end cap.

D. Finishes:
   1. Metal Parts: All exposed cast iron and steel parts shall be powder coated, with average dry film thickness of 2.5 mils.
      a. Color: As selected by Architect from manufacturer's full range.
   2. Plastic Components: Color as selected by Architect from manufacturer's full range.

2.03 TELESCOPING SEATING PLATFORM

A. Manufacturers:
   1. Basis of Design Manufacturer:
      a. Hussey Seating Company; Product - "MAXAM Plus": www.husseyseating.com.
B. Other acceptable Manufacturers:
   1. StageRight; Product - "TeleMatic 200 Seating Riser": www.stageright.com.
   2. Irwin Seating Company; Model - "Model 5000": www.irwinseating.com.
C. Function: Multi-level telescopic seating riser system.
D. Wood Deck: 3/4" minimum.
E. Carpeted Decks: Provide at decks and steps double tufted, anti-static, solid and crush resistant 100% polypropylene pile with high-density foam backing carpet. Mount to Classic Wood deck as substrate. Carpet color to be of manufacturer's standard selection.
F. Telescopic Support System: Retractable and fully self-contained with no loose parts. Support system shall incorporate a linear drive system eliminating the need for heavy weight plates. Support system shall incorporate computerized technology that will maintain the system's alignment while in operation. Support system shall contain integral closure panels between each row.
G. Accessories - Provide manufacturer's compatible products:

1. Handrails.
2. Guardrails.
3. Steps.
4. End Closure Curtains: Provide closure curtains fabricated of vinyl-coated 14 oz polyester fabric on open ends of telescoping seating. Curtains to be permanently attached to wall or rear closure panels and secured to individual rows of seating. Curtain to open with seating unit into taut secure configuration and fold automatically as seating unit closes.

H. Finishes: As selected by Architect from manufacturer's full range.

I. Electrical Operation:
   1. Integral Power: Furnish and install an integral automatic electro-mechanical powered frame propulsion system, to open and close telescopic seating. Integral power and control system shall be Underwriters Laboratories, Inc. (UL) approved and listed.
      a. Operation shall be with a removable pendant control unit which plugs into seating bank for operator management of stop, start, forward, and reverse control of the power operation.
      b. 115V 1 Phase.
         1) This 1.25 Service Factor motor runs on 115V at 60 Hz and draws a full load current of 6.2 amperes. The required power supply shall be a single phase of 115 Volts, plus neutral plus ground, each with current capacity per the following schedule:
            (a) 15 Amps when 1 or 2 motors on the power supply.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that field measurements are consistent with those on the shop drawings.
B. Verify that electrical rough-ins have been installed and are accessible.
C. Do not begin installation until substrates have been properly prepared and area has been cleared of obstructions.
D. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.02 PREPARATION

A. Clean surfaces thoroughly prior to installation.
B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.03 INSTALLATION

A. Install in accordance with manufacturer's instructions.
B. Do not field cut or alter seats or structural members without approval.
C. Provide manufacturer's field representative to inspect completed installation.

3.04 ADJUSTING

A. Lubricate, test, and adjust each moving assembly to ensure proper operation in compliance with manufacturer's recommendations.

3.05 CLEANING

A. Clean exposed and semi-exposed assembly surfaces.
B. Touch up finishes on damaged or soiled areas.

3.06 CLOSEOUT ACTIVITIES

A. Demonstration and Training: Provide manufacturer's field representative to demonstrate to and train Owner's operating personnel in proper operation of equipment.
   1. Location: On site using installed equipment.
   2. Time: As agreed between Owner and Contractor.

3.07 PROTECTION

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

3.08 MAINTENANCE AND OPERATION

A. See Section 01 7000 - Execution Requirements, for additional requirements relating to maintenance service.
B. Instructions: Maintenance operation shall be transmitted to the Owner by the manufacturer of the seating or his representative.
C. Service: Maintenance and operation of the seating system shall be the responsibility of the Owner or his duly authorized representative, and shall include the following:
   1. Operation of the Seating System shall be supervised by responsible personnel who will assure that the operation is in accordance with the manufacturer's instructions.
   2. Only attachments specifically approved by the manufacturer for the specific installation shall be attached to the seating.
   3. An annual inspection and required maintenance of each seating system shall be performed to assure safe conditions. At least biannually the inspection shall be performed by a professional engineer or factory qualified service personnel.

END OF SECTION 12 7000

SECTION 12 9300

SITE FURNISHINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Furnish all labor, materials, equipment, tools and services required to fully complete all Site Seating and Table work as is indicated on the drawings and/or specified herein including, but not limited to, the following described items.
B. Bicycle racks.
   1. Two (2) each 20 bike rack
C. 12 inch pre-cast concrete bollards
D. Do not include sales tax, refer to Section 00 1115 - Advertisement for Prequalification of Bidders.

1.02 RELATED SECTIONS

A. Section 04 2731 - Reinforced Unit Masonry.
B. Division 32 - Site Concrete.

1.03 REFERENCE STANDARDS

A. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2017.
B. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2008.

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.
C. Shop Drawings: Complete details of layout and assembly, showing member sizes and part identification, fasteners, anchors, and fittings.
D. Selection Samples: Color selections shall be made from the manufacturer's brochure representing manufacturer's full range of available colors and patterns.
E. Manufacturer's Certificates: Certify products meet or exceed specified requirements.
F. Warranty: Submit manufacturer warranty and ensure that forms have been completed in Murray City School District '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 five years of documented experience.
B. Installer Qualifications: Company specializing in performing the work of this section with minimum five years of experience.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Store products in manufacturer's unopened packaging until ready for installation.
B. Protect materials from exposure to moisture. Do not deliver until conditions are ready for installation.

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.
C. Limited twenty-year warranty against structural failure of all steel bench frames or complete steel bench assemblies.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. RJ Thomas Manufacturing: www.pilotrock.com.
B. Belson Outdoors LLC: www.belson.com
C. Substitutions: See Section 01 6000 - Product Requirements.

2.02 BICYCLE RACKS

A. Bicycle Racks:
    1. Basis of Design: Versatile Vertical Bike Rack Bell Style RJ Thomas Manufacturing.
        a. Twenty bikes double sided Model BR220DS
            1) Dimensions: 150" long x 46" wide x 33" high.
    2. Materials: 1.66 inch O.D. x 10 gage wall steel tube end frames and Cross Tubes, 5/8 inch O.D. solid steel bar vertical stall bars.
    3. Finish: Hot-Dipped Galvanized as per ASTM A123/A123M, 2.0 oz/sq.ft. zinc coating.
    4. Anchors: 3/8 inch x 5 inch heavy duty screw anchors as recommended by manufacturer.

2.03 PRECAST CONCRETE BOLLARDS

A. Semi Dome Top Concrete Bollard.
    1. Anchor Style B - for barricade installation.
        a. 3-inch diameter steel pipe and concrete footing as required for installation of bollard as recommended by manufacturer.
    2. Model TF6021 by Belson Outdoors, LLC.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that mounting surfaces, preinstalled anchor bolts, or other mounting devices are properly installed; and ready to receive site furnishing items.
B. Do not begin installation until substrates have been properly prepared.
C. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.02 PREPARATION

A. Clean surfaces thoroughly prior to installation.
B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.03 INSTALLATION

A. Install in accordance with manufacturer's instructions.

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 12 9300

This page intentionally left blank

SECTION 13 3416

EXTERIOR BLEACHERS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Furnish all labor, materials, equipment, tools and services to fully complete all Exterior Bleacher work as is indicated on the drawings and/or specified herein including, but not limited to, the following described items.
B. Non-Elevated Frame-Type Bleachers - 2 unit required.
C. Do not include sales tax, refer to Section 00 1115 - Advertisement for Prequalification of Bidders.

1.02 RELATED REQUIREMENTS

A. Section 03 3000 - Cast-In-Place Concrete.
B. Division 31 - Earthwork.
C. Division 32 - Exterior Improvements.

1.03 REFERENCE STANDARDS

A. {RSTEMP#34}
B. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2017.
C. ASTM A529/A529M - Standard Specification for High-Strength Carbon-Manganese Steel of Structural Quality; 2019.
D. AWS B2.1/B2.1M - Specification for Welding Procedure and Performance Qualification; 2021.
E. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2020, with Errata (2021).
F. ICC (IBC)-2009 - International Building Code; 2009.
G. ICC (IBC) - International Building Code; 2009.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide manufacturer's data sheets on system to be used, including:
    1. Preparation instructions and recommendations.
    2. Installation methods.
C. Shop Drawings: Submit shop drawings sealed by a registered professional engineer, indicating locations, dimensions, and quantities of structural systems, including framing, decking, seating, stairs and ramps. Include schedules for type, location, quantity, and details of steel and aluminum components required for project.
D. Selection Samples: Submit color chips representing manufacturer's full range of available colors.
E. Certificates:
    1. Insurance Certificate.
    2. Bid Bond.
F. Warranty: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

1.05 QUALITY ASSURANCE

A. Designer Qualifications: Perform design under direct supervision of a Professional Engineer experienced in design of this type of work and licensed in the State in which the Project is located.
B. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than ten years of documented experience. Factory welders must be AWS D1.1/D1.1M certified according to applicable code compliance.
C. Installer Qualifications: Company specializing in performing the work of this section and approved by manufacturer.
D. Must meet or exceed all State and Local applicable codes and in compliance with the International Building Code adopted by the jurisdiction and CABO/ANSI A117.1 Barrier Free Subcode.

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.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Basis of Design Manufacturer:
    1. Belson Outdoors: www.belson.com.
        a. Bleachers - Non-Elevated Frame-Type Model BLU-140.
B. Other Approved Manufacturers:
    1. Southern Bleacher Company: www.southernbleacher.com.
    2. Dant Clayton Bleachers: www.dantclayton.com.
    3. Sturdisteel: www.sturdisteel.com.
    4. Substitutions: See Section 01 6000 - Product Requirements.

2.02 NON-ELEVATED FRAME-TYPE BLEACHERS

A. Description:
    1. Unit: 5 rows x 21 feet long, 70 net seats,
    2. Vertical Rise and Horizontal Depth per Row: 6 inches x 24 inches
        a. Seat is 17 inches (432 mm) above its respective tread.
    3. Framework: Prefabricated angle bleacher frames are spaced at 6 foot (1829 mm) maximum intervals and connected by crossbraces.
    4. Seats: Nominal 2 inch x 10 inch (51 mm x 254 mm) anodized aluminum plank with 2 inch x 10 inch (51 mm x 254 mm) anodized end caps.
    5. Treads: Two nominal 2 inch x 11 inch (51 mm x 279 mm) mill aluminum planks with 2 inch x 11 inch (51 mm x 279 mm) anodized end caps.
    6. Risers: Nominal 1 inch x 6.5 inch (25 mm x 165 mm) Dur-Kyn colored aluminum riser plank beginning at Row 2; two 1 inch x 6.5 inch (25 mm x 165 mm) aluminum riser plank on top row.
    7. Guardrailing: Two lines of aluminum rail with chain link 42 inches (1067 mm) above seat on both sides of bleacher and across back of bleacher.
    8. Aisle: Aisle to be provided with 34 inch (864 mm) high handrail and intermediate rail at approximately 22 inches (559 mm) above tread. Handrails with rounded ends are discontinuous to allow access to seating through a 24 inch (610 mm) wide space. Aluminum tread nosing of contrasting color on aisle steps.

9. Wheelchair Area: Wheelchair area to be 66 inches (1676 mm) wide for two wheelchairs (33 inches (838 mm) each) and 36 inches (914 mm) for single.

B. Materials:
   1. Framework:
      a. Galvanized Steel: Structural fabrication with ASTM A529/A529M steel. Shop connections are seal welded. After fabrication, all steel is hot-dipped galvanized to ASTM A123/A123M specification.
   2. Extruded Aluminum:
      a. Seat Planks, Step Risers: Extruded aluminum alloy 6063-T6, clear anodized 204R1, AA-M10C22A31, Class II, and a wall thickness of .094 inch (2.4 mm).
      b. Tread Planks: Extruded aluminum alloy 6063-T6, mill finish and wall thickness of .094 inch (2.4 mm).
      c. Riser Planks: Factory applied, baked-on Kynar or Hylar/acrylic resin based paint coating, Dur-Kyn, as manufactured by the Valspar Corporation or Equal. Dur-Kyn meets or exceeds the physical and performance properties of {RS#34}.
         1) Colors: Custom colors as selected by Architect.
   3. Accessories:
      a. Channel End Caps: Aluminum alloy 6063-T6, clear anodized 204R1, AA-M10C22A31, Class II.
      b. Hardware:
         1) Bolts, Nuts: Galvanized or plated.
         2) Hold-Down Clip Assembly: Aluminum alloy 6061-T6.
      c. Guardrailing: Anodized aluminum rail 1-5/8 inch (41 mm) O.D. with galvanized chain link.
      d. Crossbraces: Extruded aluminum angle alloy 6061-T6, mill finish.
      e. Aisle Nose: Aluminum alloy, 6063-T6, black powder-coat finish.

C. Fabrication:
   1. Design Load: comply with ICC (IBC)-2009
      a. Live Load: 100 psf gross horizontal projection.
      b. Lateral Sway Load: 24 plf seat plank.
      c. Perpendicular Sway Load: 10 plf seat plank.
      d. Live Load of Seat and Tread Plank: 120 plf.
      e. Guardrail: 100 plf vertical and 50 plf horizontal.
   2. All connections made in shop to be shop welded.
      a. Manufactured by certified welders conforming to AWS Standards AWS D1.1/D1.1M, AWS B2.1/B2.1M.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verification of Conditions: Verify that site is ready for installation.

3.02 INSTALLATION

A. Install in accordance with manufacturer's instructions and approved shop drawings.

3.03 FIELD QUALITY CONTROL

A. See Section 01 4000 - Quality Requirements, for additional requirements.
B. Provide manufacturer's field representative to inspect grandstand installation.

3.04 CLEANING

A. Clean up and remove from site all debris caused by work of this section.

3.05 PROTECTION

A. Protect installed grandstands from subsequent construction operations.

END OF SECTION 13 3416

SECTION 14 2400

HYDRAULIC ELEVATORS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Furnish all labor, materials, equipment, tools and services required to fully complete all
B. Passenger Elevator work as is indicated on the drawings and/or specified herein including, but not limited to, the following described items.
C. Passenger Elevator
D. Elevator maintenance.
E. Do not include sales tax, refer to Section 00 0102 - Notice to Contractors.

1.02 RELATED SECTIONS

1.03 REFERENCES

1.04 SYSTEM DESCRIPTION

1.05 SUBMITTALS

1.06 QUALITY ASSURANCE

1.07 DELIVERY, STORAGE, AND HANDLING

1.08 WARRANTY

1.09 MAINTENANCE AND SERVICE

PART 2 PRODUCTS

2.01 MANUFACTURER

A. Manufacturer: Design based upon Otis HydroFit™ machine room-less elevator system.

2.02 DESIGN AND SPECIFICATIONS

A. Provide hydraulic elevators from Otis Elevator Company. The control system and car design based on materials and systems manufactured by Otis Elevator Company. Specifically, the system shall consist of the following components:
   1. The entire hydraulic system and the controller shall be located inside the hoistway. No extra machine room or control closet space is required.
   2. LED lighting standard in ceiling lights and elevator fixtures.
   3. Sleep mode operation for LED ceiling lights and car fan.
B. Approved Installer: Otis Elevator Company

2.03 EQUIPMENT: MACHINE COMPONENTS

A. The hydraulic system shall be of compact design suitable for operation under the required pressure. The power component shall be mounted in the hydraulic-fluid storage tank. The control valve shall control flow for up and down directions hydraulically and shall include an integral check valve. A control section including control solenoids shall direct the main valve and control: up and down starting, acceleration, transition from full speed to leveling speed, up and down stops, pressure relief and manual lowering. All of these functions shall be fully adjustable for maximum smoothness and to meet contract conditions. System to be provided with a low-pressure switch and a shut-off valve.

B. The entire hydraulic system with hydraulic-fluid storage tank, power component and valves shall be located in the hoistway pit and be easily accessible for maintenance through an access door in the hoistway wall.
C. A microprocessor-based controller shall be provided, including necessary starting switches together with all relays, switches, solid-state components and hardware required for operation, including door operation, as described herein. A three (3) phase overload device shall be provided to protect the motor against overloading.
D. The controller shall be located together with the hydraulic system in the hoistway pit and be easily accessible for maintenance through the same access door that is also used for the hydraulic system. The controller will be located in the optional remote machine room if selected.
E. A manual lowering feature shall permit lowering the elevator at slow speed in the event of power failure or for adjusting purposes.
F. Pressure Switch
G. Tank Heater
H. Low-oil control where required

2.04 EQUIPMENT: HOISTWAY COMPONENTS

A. Plunger(s) and Cylinder(s): Each cylinder shall be constructed of steel pipe of sufficient thickness and suitable for the operating pressure. The top of each cylinder shall be equipped with a cylinder head with a drip ring to collect any oil seepage as well as an internal guide ring and self-adjusting packing. Each plunger shall be constructed of selected steel tubing or pipe of proper diameter machined true and smooth with a fine polished finish. Each plunger shall be provided with a stop ring electrically welded to it to prevent the plunger from leaving the cylinder. Each plunger and cylinder shall be installed plumb and shall operate freely with minimum friction.
B. Car Guide Rails: Tee-section steel rails with brackets and fasteners.
C. Polyurethane type buffers shall be used.
D. Wiring: Wiring for hoistway electrical devices included in scope of the elevator system, hall panels, pit emergency stop switch, and the traveling cable for the elevator car.
E. Hoistway Entrances:
    1. Frames: Entrance frames shall be of bolted construction for complete one-piece unit assembly. All frames shall be securely fastened to fixing angles mounted in the hoistway and shall be of UL fire rated steel.
    2. Sills shall be extruded: Aluminum
    3. Doors: Entrance doors shall be of metal construction with vertical channel reinforcements.
    4. Fire Rating: Entrance and doors shall be UL fire rated for 1-1/2 hour
    5. Entrance Finish: Satin Stainless Steel
    6. Entrance Marking Plates: Entrance jambs shall be marked with 4” x 4” (4.02 inch x 102 mm) plates having raised floor markings with Braille located adjacent to the floor marking. Marking plates shall be provided on both sides of the entrance.
    7. Sight Guards: Sight guards will be furnished with all doors painted to match with painted doors, painted black for stainless steel doors.

2.05 EQUIPMENT: CAR COMPONENTS

A. Cab: Steel Shell Cab with raised laminate wall panels
    1. Brushed Stainless Steel finished vertical trim pieces are optional.
B. Car Front Finish: Brushed Stainless Steel.
C. Car Door Finish: Brushed Stainless Steel.
D. Ceiling Type: Dropped ceiling with LED lights
E. Car Front Finish: Brushed Stainless Steel.
F. Car Door Finish: Brushed Stainless Steel.

G. Ceiling Finish: Brushed Steel Finish
H. Emergency Car Lighting: An emergency power unit employing a 6-volt sealed rechargeable battery and totally static circuits shall be provided to illuminate the elevator car in the event of building power failure.
I. Fan: A one-speed 120 VAC fan will be mounted to the ceiling to facilitate in-car air circulation, meeting A17.1 code requirements. The fan shall be rubber mounted to prevent the transmission of structural vibration and will include a baffle to diffuse audible noise. A switch shall be provided in the car-operating panel to control the fan.
J. Handrails: Brushed steel finish, 3/8" x 2" flat tubular bar handrails shall be provided on the side walls.
K. Threshold: Aluminum
L. Emergency Exit Contact: An electrical contact shall be provided on the car-top exit.
M. The LED ceiling lights, and the fan should automatically shut off when the system is not in use and be powered back up after a passenger calls the elevator and pushes a hall button.

2.06 EQUIPMENT: SIGNAL DEVICES AND FIXTURES

1. The car operating panel shall be equipped with the following features:
    a. Raised markings and Braille to the left-hand side of each push-button.
    b. Car Position Indicator at the top of and integral to the car operating panel.
    c. Door open and door close buttons.
    d. Inspection key-switch.
    e. Elevator Data Plate marked with elevator capacity and car number.
    f. Help Button: The help button shall initiate two-way communication between the car and a location inside the building, switching over to another location if the call is unanswered, where personnel are available who can take the appropriate action. Visual indicators are provided for call initiation and call acknowledgement.
    g. Landing Passing Signal: A chime bell shall sound in the car to signal that the car is either stopping at or passing a floor served by the elevator.
    h. In car stop switch (toggle or key unless local code prohibits use)
    i. Firefighter's hat (standard USA)
    j. Firefighter's Phase II Key-switch (standard USA)
    k. Call Cancel Button (standard USA)

B. Car Position Indicator: A digital, LED car position indicator shall be integral to the car operating panel.
C. Hall Fixtures: Hall fixtures shall be provided with necessary push buttons and key switches for elevator operation.
    1. Integral Hall fixtures shall feature round stainless steel, mechanical buttons marked to correspond to the landings. Hall fixtures to be located in the entrance frame face. Buttons shall be in vertically mounted fixture. Fixture shall be Brushed Stainless Steel finish.
    2. Button: Flat flush mounted, Brushed Stainless Steel button with blue or white LED illuminating halo
    3. Car Lantern and Chime: A directional lantern visible from the corridor shall be provided in the car entrance. When the car stops and the doors are opening, the lantern shall indicate the direction in which the car is to travel, and a chime will sound.
D. Access key-switch at top floor in entrance jamb.
E. Access key-switch at lowest floor in entrance jamb.
F. Card Reader Provision

PART 3 EXECUTION

3.01 PREPARATION

A. Take field dimensions and examine conditions of substrates, supports, and other conditions under which this work is to be performed. Do not proceed with work until unsatisfactory conditions are corrected.

3.02 INSTALLATION

A. Installation of all elevator components except as specifically provided for elsewhere by others.

3.03 DEMONSTRATION

A. The elevator contractor shall make a final check of each elevator operation with the Owner or Owner’s representative present prior to turning each elevator over for use. The elevator contractor shall determine that control systems and operating devices are functioning properly.

END OF SECTION 14 2400

SECTION 31 0000

GEOTECHNICAL INVESTIGATION

PART 1 GENERAL

1.01 SUMMARY

A. Geotechnical Investigation
   1. The Contractor shall examine the attached Geotechnical Reports. The investigations are bound in this Project Manual and follows as 31 0200 The Contractor shall become fully aware of the natural conditions that exist and are noted in the investigations.
   2. The Contractor shall be aware that due to the nature of existing subsoils, special precautions are noted and should be observed.
   3. If any conflicts occur between the construction documents and this report, the report shall govern.

1.02 GENERAL SITE INFORMATION

A. The Contractor shall examine the site personally to ascertain the state thereof and to understand the complexities of the Work. The Contractor shall compare the site with the drawings and the Geotechnical Investigation, and become familiar with the conditions of the premises, the actual elevations, existing obstructions, areas of work and other conditions that would affect the completion of the work.
B. The Contractor shall observe soil conditions throughout the duration of the site work operations and shall notify the Architect of any deviation in actual soil conditions from those expected based on the Geotechnical Investigation bound herein.

PART 2 PRODUCTS (NOT APPLICABLE)

PART 3 EXECUTION (NOT APPLICABLE)

END OF SECTION 31 0000

This page intentionally left blank

CMT TECHNICAL SERVICES

ENGINEERING • GEOTECHNICAL • ENVIRONMENTAL (ESA I & II) • MATERIALS TESTING • SPECIAL INSPECTIONS • ORGANIC CHEMISTRY • PAVEMENT DESIGN • GEOLOGY

GEOTECHNICAL ENGINEERING STUDY

Riverview Junior High School

About 751 Tripp Lane
Murray, Utah

CMT PROJECT NO. 22751

FOR:
Murray City School District
5102 South Commerce Drive
Murray, Utah 84107

August 28, 2024

CMT TECHNICAL SERVICES

August 28, 2024

Mr. Richard Reese
Murray School District
5102 South Commerce Drive
Murray, Utah 84107

Subject: Geotechnical Engineering Study
Riverview Junior High School
About 751 Tripp Lane
Murray, Utah
CMT Project Number: 22751

Mr. Reese:

CMT Technical Services (CMT) submits herewith this geotechnical engineering study report for the subject site. This report contains the results of our findings and an engineering interpretation of the results with respect to the available project characteristics. It also contains recommendations to aid in the design and construction of the earth related phases of this project.

On August 6, 2024, a CMT staff professional was on-site and observed the drilling of 13 bore holes extending to depths of approximately 6.5 to 51.5 feet below the existing ground surface. Samples of the subsurface soils were obtained within the bore holes during the field operations and subsequently transported to our laboratory for further observation and testing of select samples.

Conventional spread and/or continuous footings may be utilized to support the proposed structure, provided the recommendations in this report are followed. This report presents detailed discussions of design and construction criteria for this site.

We appreciate the opportunity to work with you at this stage of the project. CMT offers a full range of Geotechnical Engineering, Geological, Material Testing, Special Inspection services, and Phase I and II Environmental Site Assessments. With offices throughout Utah, Idaho, Arizona, Colorado and Texas, our staff is capable of efficiently serving your project needs. If we can be of further assistance or if you have any questions regarding this project, please do not hesitate to contact us at 801-492-4132.

Sincerely,
CMT Technical Services

LICENSED PROFESSIONAL ENGINEER # 374995 JEFFREY J. EGBERT 8/28/24 STATE OF UTAH

Jeffrey J. Egbert, P.E., LEED A.P., M. ASCE
Senior Geotechnical Engineer

Reviewed by:

William G. Turner, P.E., M. ASCE
Senior Geotechnical Engineer

CMT TECHNICAL SERVICES

TABLE OF CONTENTS

1.0 INTRODUCTION **1**
1.1 General 1
1.2 Objectives, Scope and Authorization 1
1.3 Description of Proposed Construction 2
1.4 Executive Summary 2
2.0 FIELD EXPLORATION **3**
2.2 Infiltration Testing 3
3.0 LABORATORY TESTING **4**
4.0 GEOLOGIC & SEISMIC CONDITIONS **5**
4.1 Geologic Setting 5
4.2 Faulting 7
4.3 Seismicity 7
4.4 Liquefaction 8
4.5 Other Geologic Hazards 8
5.0 SITE CONDITIONS **8**
5.1 Surface Conditions 8
5.2 Subsurface Soils 9
5.3 Groundwater 9
5.4 Site Subsurface Variations 9
6.0 SITE PREPARATION AND GRADING **9**
6.1 General 9
6.2 Temporary Excavations 10
6.3 Fill Material 11
6.4 Fill Placement and Compaction 11
6.5 Utility Trenches 12
6.6 Stabilization 12
7.0 FOUNDATION RECOMMENDATIONS **13**
7.1 Continuous/Spread Footings 13
7.2 Installation 14
7.3 Estimated Settlement 14
7.4 Lateral Resistance 14
8.0 LATERAL EARTH PRESSURES **15**
9.0 FLOOR SLABS **15**
10.0 DRAINAGE RECOMMENDATIONS **16**
11.0 PAVEMENTS **16**
12.0 QUALITY CONTROL **18**
12.1 Field Observations 18
12.2 Fill Compaction 18
12.3 Excavations 18
13.0 LIMITATIONS **18**

APPENDIX

Figure 1: Site Map
Figures 2-14: Bore Hole Log
Figure 15: Key to Symbols

1.0 INTRODUCTION

1.1 General

CMT Technical Services (CMT) was retained to conduct a geotechnical subsurface study for the proposed new Riverview Junior High School located at about 751 Tripp Lane in Murray, Utah, as shown in **Exhibit 1 - Vicinity Map** below.

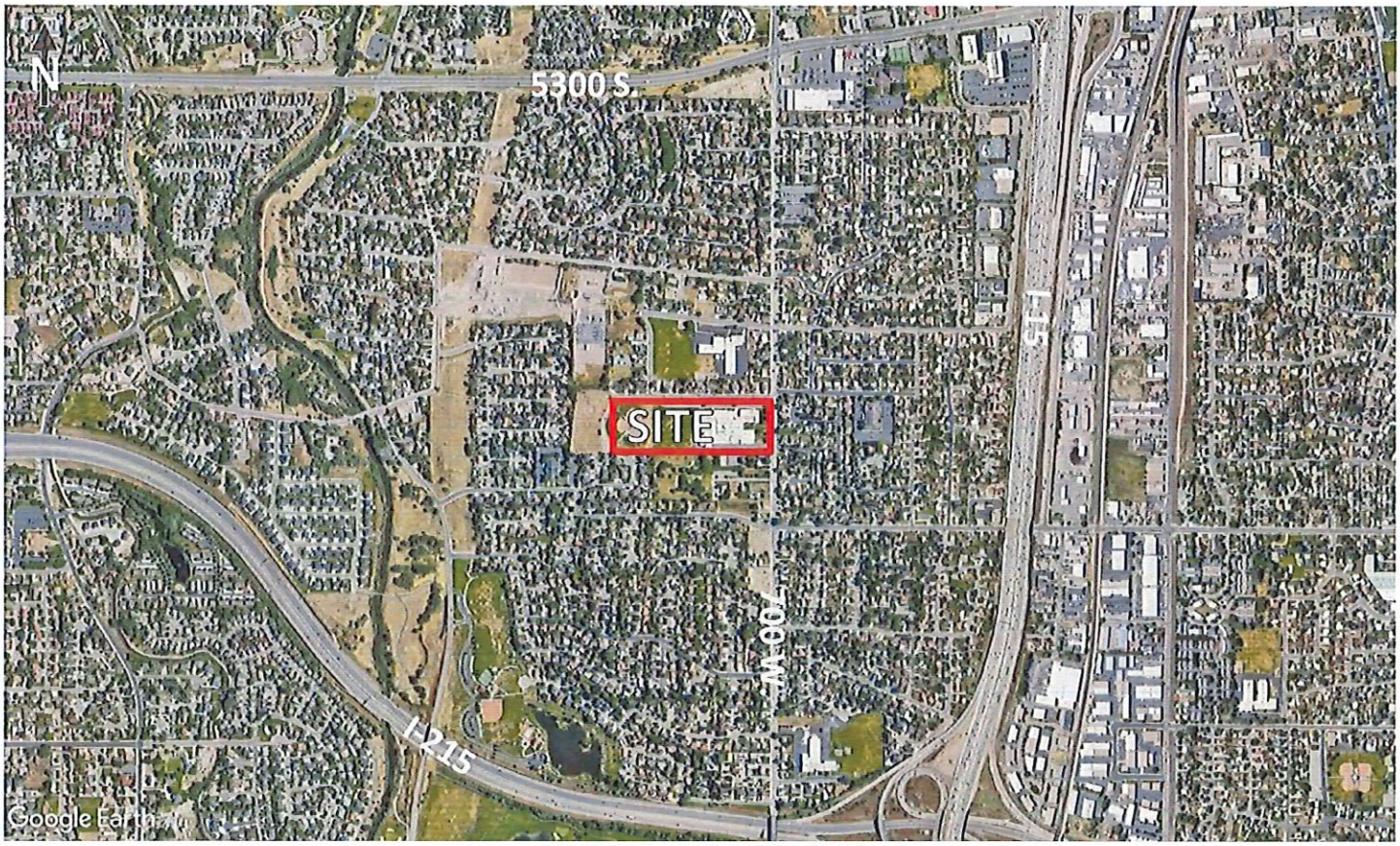


EXHIBIT 1 - VICINITY MAP

1.2 Objectives, Scope and Authorization

The objectives and scope of our study were planned in discussions among Mr. Chris Kartchner with Big-D|Kitchell, Mr. Richard Reese with Murray City School District, and Mr. Andrew Harris with CMT. In general, the objectives of this study were to define and evaluate the subsurface soil and groundwater conditions at the site, and provide appropriate foundation, earthwork, and seismic recommendations to be utilized in the design and construction of the proposed addition.

In accomplishing these objectives, our scope of work has included performing field exploration, which consisted of the observing/logging/sampling of 13 bore holes, performing double ring infiltration tests in 4 test pits excavated for that purpose (DR-1 through DR-4), performing laboratory testing on representative samples of

the subsurface soils collected in the bore holes, and conducting an office program, which consisted of correlating available data, performing engineering analyses, and preparing this summary report. This scope of work was authorized by returning a signed copy of our proposal dated June 27, 2024, and executed on July 17, 2024.

1.3 Description of Proposed Construction

We understand that the proposed construction consists of a new junior high school to be located immediately west of the existing junior high school. We understand the new school will have up to two levels and be constructed of light steel framing and reinforced masonry block. We project that wall loads will not exceed 8,500 pounds per linear foot and column loads will not exceed 200,000 pounds. Floor slab loads are anticipated to be relatively light, with an average uniform loading not exceeding 100 pounds per square foot. If the structural loading conditions are different than we have projected, please notify us so that any appropriate modifications to our conclusions and recommendations contained herein can be made.

Site development will require some earthwork in the form of minor cutting and filling. A site grading plan was not available at the time of this report, but we project that maximum cuts and fills may be on the order of 3 to 4 feet. If deeper cuts or fills are planned, CMT should be notified to provide additional recommendations, if needed.

1.4 Executive Summary

The most significant geotechnical aspects regarding site development include the following:

1. Predominately sod and topsoil on the surface of the site to about 6 inches in depth, except at the location of B-11 where a thin layer of aggregate base fill was encountered on the surface. Other fill soils could be encountered in areas not explored.
2. Subsurface natural soils encountered consisted of Lean CLAY (CL), Fat CLAY (CH), SILT (ML), and SAND (SM) layers, extending to the maximum depth explored of 51.5 feet below the existing ground surface.
3. Groundwater was noted in bore hole B-1 only, initially at about 22 feet below the surface but later measured at approximately 15 feet below the surface.
4. Saturated subsurface soils consisted of clay which may be subject to cyclic softening/settlement during an earthquake.
5. Foundations and floor slabs may be constructed on suitable undisturbed natural soils or on structural/engineered fill which extends to natural soils.

CMT must assess that topsoil, undocumented fills (if encountered), debris, disturbed or unsuitable soils have been removed and that suitable soils have been encountered prior to placing site grading fills, footings, slabs, and pavements.

In the following sections, detailed discussions pertaining to the site are provided, including subsurface descriptions, geologic setting, seismicity, earthwork, foundations, lateral resistance, lateral pressure, floor slabs, and pavements.

2.0 FIELD EXPLORATION

2.1 General

To define and evaluate the subsurface soil and groundwater conditions, 13 bore holes were drilled at the site to depths of approximately 6.5 to 51.5 feet below the existing surfaces. The bore holes were logged and sampled by experienced members of our geotechnical staff. Locations of the explorations are shown on ***Figure 1, Site Plan***, included in the Appendix.

Samples of the subsurface soils encountered in the bore holes were collected at varying depths through the hollow stem drill augers. Relatively undisturbed samples were obtained by hydraulically pushing a 3-inch diameter (Shelby) tube or by driving a split-spoon sampler with 2.5-inch outside diameter rings/liners into the undisturbed soils below the drill augers. Disturbed samples were collected utilizing a standard split spoon sampler that was driven 18 inches into the soils below the drill augers using a 140-pound hammer free-falling a distance of 30 inches. The number of hammer blows needed for each 6-inch interval was recorded. The sum of the hammer blows for the final 12 inches of penetration is known as a standard penetration test and this 'blow count' was recorded on the bore hole logs. The blow count provides an approximation of the relative density of granular soils, but only a limited indication of the relative consistency of silt/clay soils because the consistency of these soils is significantly influenced by the moisture content.

The samples of the subsurface soils retrieved in the bore holes were classified in the field based upon visual and textural examination, logged and described in general accordance with ASTM[1] D-2488. These field classifications were supplemented by subsequent examination and testing of select samples in our laboratory. Logs of the bore holes, including a description of the soil strata encountered, are presented on each individual Bore Hole Log, ***Figures 2 through 14***, included in the Appendix. Sampling information and other pertinent data and observations are also included on the logs. In addition, a Key to Symbols defining the terms and symbols used on the logs is provided as ***Figure 15*** in the Appendix.

Following completion of drilling and sampling operations a 1.25 inch diameter slotted PVC pipe was installed in B-1 to facilitate subsequent groundwater level measurements. The bore holes were backfilled with auger cuttings.

2.2 Infiltration Testing

Infiltration testing was also performed as part of our field exploration within 4 tests pits excavated to approximately 5 feet below the existing ground surface at the locations shown on ***Figure 1*** (DR-1 through DR-4). The infiltration tests consisted of seating two rings into the soils at the base of the test pits and soaking the soils within the rings for approximately 15 minutes. Following the soaking period the rings were filled with water and the rate of water level drop with time was measured. The tests were monitored for a period of approximately 4 hours. The infiltration rates measured are presented in the table on the following page:

[1] American Society for Testing and Materials

TEST #	DEPTH (feet)	SOIL CLASS	INFILTRATION RATE (min/inch)
DR-1	5	SM	6
DR-2	5	SM	30
DR-3	5	SM	30
DR-4	5	SM	120

3.0 LABORATORY TESTING

Selected samples of the subsurface soils were subjected to various laboratory tests to assess the following pertinent engineering properties:

1. Moisture Content, ASTM D-2216, Percent moisture representative of field conditions
2. Dry Density, ASTM D-2937, Dry unit weight representing field conditions
3. Atterberg Limits, ASTM D-4648, Plasticity and workability
4. Gradation Analysis, ASTM D-1140/C-117, Grain Size Analysis
5. One Dimensional Consolidation, ASTM D-2435, Consolidation properties
6. Moisture-Density Relationship (Proctor), ASTM D-1557, compaction parameters
7. California Bearing Ratio, AASHTO T-193, Pavement support
8. Vane Shear Test, ASTM D-4648, Shear strength parameters

To provide data for an analysis of potential settlement from structural loading, a one-dimensional consolidation test was performed on each of 3 samples of the subsurface natural soils collected in the bore holes. Based upon data obtained from the consolidation testing, the silt soils at this site are moderately over-consolidated and moderately compressible under additional loading. Detailed results of the consolidation tests are maintained within our files and can be transmitted to you, if so desired.

Laboratory test results are presented on the bore hole logs (***Figures 2 through 14***) and in the **Lab Summary Tables** on the following page:

LAB SUMMARY TABLES

BORE HOLE	DEPTH (feet)	SOIL CLASS	SAMPLE TYPE	MOISTURE CONTENT(%)	DRY DENSITY (pcf)	GRADATION			ATTERBERG LIMITS			VANE SHEAR (psf)
						GRAV.	SAND	FINES	LL	PL	PI	
B-1	2.5	ML	Rings	30	93			96				
B-1	5	ML	SPT	13		0	30	70	21	20	1	
B-1	7.5	ML	Rings	26	100							
B-1	25	CL	SPT	33				93	29	20	9	
B-1	35	CH	SPT	34				98	51	20	31	
B-1	45	SM	SPT	12		0	70	30				
B-2	5	CL	Rings	22	93	0	19	81				
B-2	7.5	CL	SPT	31				96	32	20	12	
B-2	15	CL	Rings	32	90			95				3660
B-2	20	CL	SPT	31				94	35	19	16	
B-3	2.5	CL	SPT	12		3	38	59				
B-3	7.5	CL	SPT	22				99				
B-3	10	CL	Rings	27	94							
B-5	2.5	CL	Rings	21		0	31	69				
B-6	5	SM	SPT	10		4	50	46				
B-6	10	CL	SPT	29					32	21	11	
B-6	15	CL	Rings	30	91			99				4098
B-7	2.5	SM	SPT	4		3	78	19				
B-7	7.5	CL	Shelby	26		0	18	82				
B-8	2.5	SM	SPT	7		0	71	29				
B-8	5	SM	SPT	4		5	78	17				
B-9	5	SM	Rings	12	88	0	65	35				
B-9	10	CL	SPT	31				97				
B-10	5	ML	SPT	16		1	40	59				
B-10	7.5	CL	Rings	25	97			96	33	21	12	
B-11	2.5	CL	SPT	19		0	31	69				
B-12	1	ML/SM	Bulk			0	50	50				
B-12	2.5	SM	SPT	11		0	75	25				
B-13	5	ML	SPT	19		0	42	58				

SAMPLE TYPE	SOIL CLASS	OPTIMUM MOISTURE(%)	MAX DRY DENSITY (pcf)	CBR (%)
Bulk	ML/SM	10.2	123.5	16

4.0 GEOLOGIC & SEISMIC CONDITIONS

4.1 Geologic Setting

The subject site is in the central portion of the Salt Lake Valley in north-central Utah and sits at an elevation of approximately 4,328 feet above sea level. The Salt Lake Valley is a deep, sediment-filled basin that is part of the

Basin and Range Physiographic Province. The valley is bounded by the Wasatch Mountain Range on the east and the Oquirrh Mountain Range on the west, and was formed by extensional tectonic processes during the Tertiary and Quaternary geologic time periods. The subject site and surrounding areas are located within the Intermountain Seismic Belt, a zone of ongoing tectonism and seismic activity extending from southwestern Montana to southwestern Utah. The active (evidence of movement in the last 10,000 years) Wasatch Fault Zone is part of the Intermountain Seismic Belt and extends from southeastern Idaho to central Utah along the western base of the Wasatch Mountain Range.

Much of northwestern Utah, including the Salt Lake Valley, was also previously covered by the Pleistocene age Lake Bonneville. The Great Salt Lake, located to the northwest of the valley, is a remnant of this ancient freshwater lake. Lake Bonneville reached a high-stand elevation of between approximately 5,160 and 5,200 feet above sea level at between 18,500 and 17,400 years ago. Approximately 17,400 years ago, the lake breached its basin in southeastern Idaho and dropped by almost 300 feet relatively fast as water drained into the Snake River. Following this catastrophic release, the lake level continued to drop slowly over time, primarily driven by drier climatic conditions, until reaching the current level of the Great Salt Lake. Shoreline terraces formed at the high-stand elevation of the lake and several subsequent lower lake levels are visible in places on the mountain slopes surrounding the valleys of northwest Utah. Much of the sediment within the Salt Lake Valley was deposited as lacustrine sediments during both the transgressive (rise) and regressive (fall) phases of Lake Bonneville and in older, pre-Bonneville lakes that previously occupied the basin.

The geology of the USGS Salt Lake City South, Utah 7.5 Minute Quadrangle, that includes the location of the subject site, has been mapped by McKean[2]. The surficial geology at the subject site and adjacent areas is mapped as "Lacustrine sand and silt" Map Unit Qls) dated upper Pleistocene. Unit Qls is described as "Moderately sorted fine to coarse sand, silt, clay, and minor pebbly gravel; thin to thick bedded; commonly has ripple marks and scour features; deposited in relatively shallow water nearshore, downslope from gravel and sand (Qlg); distinguished from Qlf and Qlg by the presence of silty sand and sand as indicated in soil maps (NRCS, 2015); ... exposed thickness more than 30 feet (10 m)." No fill or disturbed ground is mapped within the subject site. Refer to **Exhibit 2 - Geologic Map**, shown on the following page.

[2]McKean, A.P., 2017, Interim Geologic Map of the Salt Lake City South Quadrangle, Salt Lake County, Utah; Utah Geological Survey Open File Report 676, Scale 1:24,000.

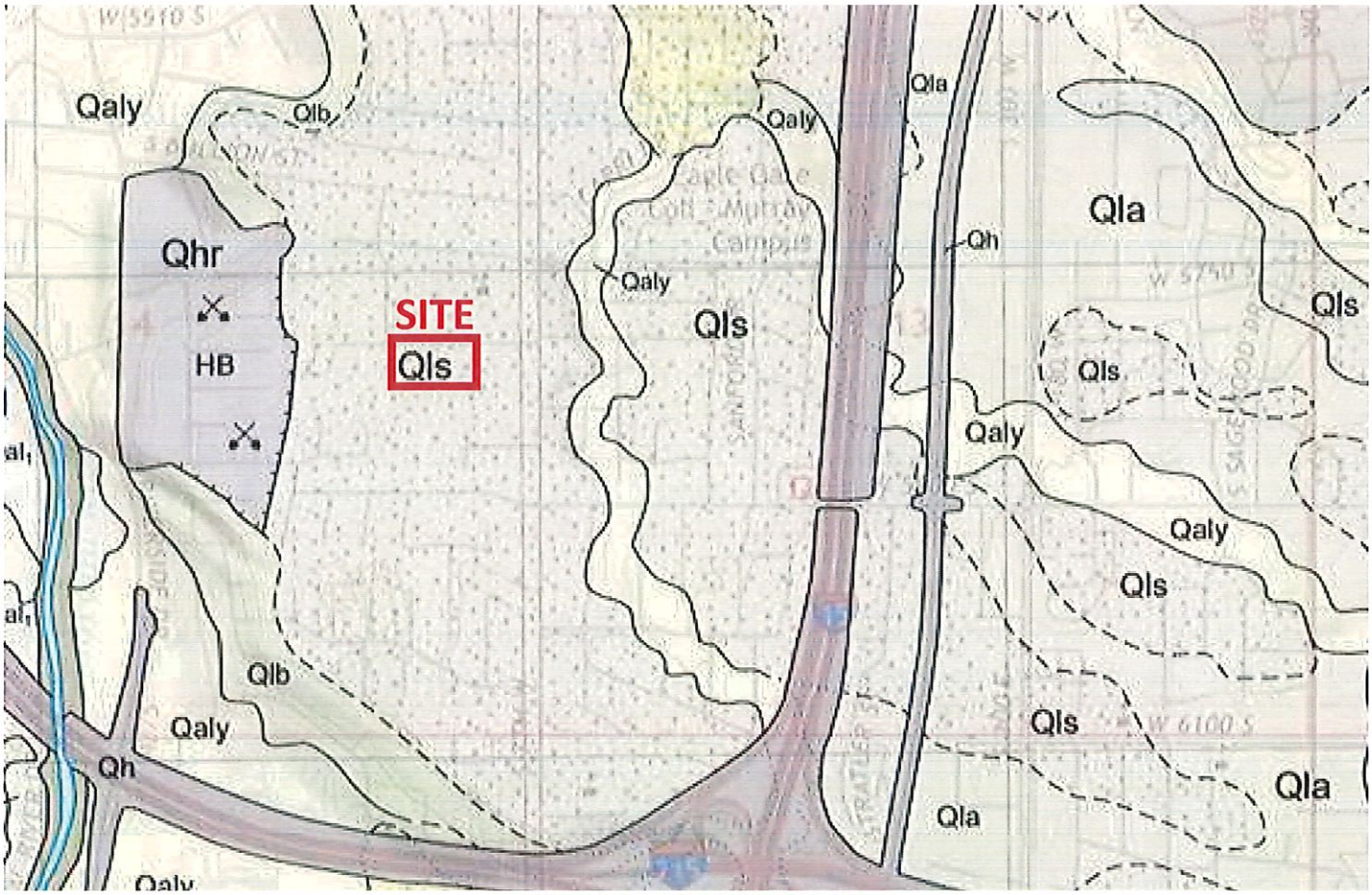


EXHIBIT 2 - GEOLOGIC MAP

4.2 Faulting

No active fault rupture traces are mapped crossing, adjacent to, or projecting toward the subject site. The nearest active faults to the subject site are the Taylorsville fault 2.5 miles to the northwest, and the Salt Lake City Segment of the Wasatch Fault Zone approximately 5.4 miles to the east.

4.3 Seismicity

Utah has adopted the International Building Code (IBC) 2021, which determines the seismic hazard for a site based upon 2014 mapping of bedrock accelerations prepared by the United States Geologic Survey (USGS) and the soil site class. CMT is performing a Ground Motion Hazard Analysis to determine appropriate ground motions for seismic structural design which will be provided in a separate report.

4.4 Liquefaction

Liquefaction is defined as the condition when saturated, loose, sandy soils lose their support capabilities because of excessive pore water pressure which develops during a seismic event. Clayey soils, even if saturated, will generally not liquefy during a major seismic event.

The site is located within an area designated by the Utah Geologic Survey[3] as having "Moderate" liquefaction potential. This is defined as having between a 10% and 50% probability that within a 100-year period and earthquake strong enough to cause liquefaction will occur.

Bore hole B-1 was extended to a depth of approximately 51.5 feet below the ground surface to assess the liquefaction potential of the subsurface soils. Groundwater was initially encountered in B-1 at approximately 22 feet below the ground surface, but later measured at approximately 15 feet below the surface. The subsurface soils we encountered below the measured groundwater level predominately consisted of clay, with a deep layer of dense to very dense silty sand. Where the clay soils have a plasticity index of less than 12, and the moisture content is greater than 85% of the liquid limit, 'cyclic softening' of the clay soils could occur, which could potentially result in some settlement (we estimate the settlement will be less than 2 inches differential over a distance of 50 feet). We encountered these conditions at 15, 20, and 25 feet below the surface in B-1. Note that geologic mapping does not show any lateral spread deposits (evidence of past liquefaction related movements) on or adjacent to the site.

4.5 Other Geologic Hazards

No landslide features or deposits, including lateral spread deposits, are mapped on or adjacent to the subject site. The site is not located in a mapped or known debris flow, stream flooding[4], or rock fall hazard area.

5.0 SITE CONDITIONS

5.1 Surface Conditions

The site is currently predominately a lawn area immediately west of the existing school building, with some ball fields on the western edge of the proposed building location. There is also a paved parking area on the northern portion of the site. Site grade is relatively flat. Based upon aerial photos dating back to 1997 that are readily available on the internet, the site appears to have changed relatively little since that time. The campus is bordered on the north by Tripp Lane, on the south by residences, on the east by 700 West, and on the west by a vacant field and residences beyond (see **Vicinity Map** in **Section 1.1** above).

[3]Utah Geological Survey, "Liquefaction-Potential Map for a Part of Salt Lake County, Utah," Utah Geological Survey Public Information Series 25, August 1994. https://ugspub.nr.utah.gov/publications/public_information/pi-25.pdf
[4]https://msc.fema.gov/portal/search?AddressQuery=1600%20South%20900%20West%2C%20Salt%20Lake%20City%2C%20UT

5.2 Subsurface Soils

At the locations of all but bore hole B-11 we encountered approximately 6 inches of sod/topsoil on the surface. At the location of B-11, approximately 4 inches of aggregate base was noted on the surface. The subsurface natural soils predominately consisted of Lean CLAY (CL) with varying amounts of sand, of soft to stiff consistency based upon the blow counts. Some layers of SILT (ML) with varying amounts of sand, and Silty SAND (SM) were also encountered in several of the bore holes. The silt layers were generally of medium stiff to stiff consistency, and the sand layers in a loose to very dense state, based upon the blow counts. In B-1 we encountered a layer of very soft to very stiff Fat CLAY (CH) extending between about 29.5 and 45 feet below the surface.

For a more descriptive interpretation of subsurface conditions, please refer to the bore hole logs, ***Figures 2 through 14***, which graphically represent the subsurface conditions encountered. The lines designating the interface between soil types on the logs generally represent approximate boundaries; in situ, the transition between soil types may be gradual.

5.3 Groundwater

Groundwater was encountered in B-1 only. During drilling groundwater was noted at approximately 22 feet below the surface. On August 20, 2024, CMT personnel returned to the site and measured groundwater in the slotted PVC pipe placed in B-1 at approximately 15 feet below the surface. Groundwater was not encountered in the other bore holes at the time of drilling, though some nearer surface soils were very moist. Groundwater is not anticipated to be encountered during construction.

Groundwater levels can fluctuate seasonally. Numerous other factors such as heavy precipitation, irrigation of neighboring land, and other unforeseen factors, may also influence ground water elevations at the site. The detailed evaluation of these and other factors, which may be responsible for ground water fluctuations, and the magnitude of potential fluctuations, is beyond the scope of this study.

5.4 Site Subsurface Variations

Based on the results of the subsurface explorations and our experience, variations in the continuity and nature of subsurface conditions should be anticipated. Due to the heterogeneous characteristics of natural soils, care should be taken in interpolating or extrapolating subsurface conditions between or beyond the exploratory locations.

6.0 SITE PREPARATION AND GRADING

6.1 General

If desired, the existing asphalt pavement on the northern portion of the site could be milled, mixed with imported granular soils (such that the mixture does not contain more than 25% asphalt millings) and used as sub-base material or as site-grading fill. Otherwise, the existing asphalt pavement materials should be removed.

Existing road-base materials could potentially remain in place outside of the building footprint but should first be proof-rolled to identify any soft spots, which should be stabilized as discussed below in **Section 6.6**.

All other deleterious materials should be stripped from the site prior to commencement of construction activities. This includes vegetation, topsoil, loose and disturbed soils, etc. The sod and topsoil were found to be approximately 6 inches in thickness. Vegetation, including root systems, and topsoil are to be completely removed from the building footprint. Any existing utilities must either be rerouted or removed and the resulting excavation backfilled with structural fill. Given the existing development of the site, there is a potential that grading fill or other fill soils, which will likely vary in depth and lateral extent, could be encountered.

Following clearing, grubbing the subgrade should be observed by a CMT geotechnical engineer to assess that suitable natural soils have been exposed and any deleterious materials, loose and/or disturbed soils have been removed, prior to placing site grading fills, footings, slabs, or pavements.

Fill placed over large areas to raise overall site grades can induce settlements in the underlying natural soils. If more than 3 feet of site grading fill is anticipated over the existing ground surface, we should be notified to assess potential settlements and provide additional recommendations as needed. These recommendations may include placement of the site grading fill far in advance to allow potential settlements to occur prior to construction.

6.2 Temporary Excavations

Excavations deeper than 8 feet are not anticipated at the site. Groundwater was initially encountered at approximately 22 feet below the surface, and later measured at 15 feet. Based upon these conditions, groundwater is not anticipated to be encountered in excavations.

In clayey (cohesive) soils, temporary construction excavations not exceeding 4 feet in depth may be constructed with near-vertical side slopes. Temporary excavations up to 8 feet deep, above or below groundwater, may be constructed with side slopes no steeper than one-half horizontal to one vertical (0.5H:1V).

For silty/sandy (cohesionless) soils, temporary construction excavations not exceeding 4 feet in depth should be no steeper than one-half horizontal to one vertical (0.5H:1V). For excavations up to 8 feet and above groundwater, side slopes should be no steeper than one horizontal to one vertical (1H:1V). Excavations encountering saturated cohesionless soils will be very difficult to maintain and will require very flat side slopes and/or shoring, bracing and dewatering.

To reduce disturbance of the natural soils during excavation, we recommend that smooth edge buckets/blades be utilized.

All excavations must be inspected periodically by qualified personnel. If any signs of instability or excessive sloughing are noted, immediate remedial action must be initiated. All excavations should be made following OSHA safety guidelines.

6.3 Fill Material

Structural fill is defined as fill that will ultimately be subjected to structural loads imposed by footings, floor slabs, pavements, etc. Structural fill will be required as backfill over foundations and utilities, as site grading fill, and potentially as replacement fill below footings. All structural fill must be free of sod, rubbish, topsoil, frozen soil, and other deleterious materials. Following are our recommendations for the various fill types we anticipate will be used at this site:

FILL MATERIAL TYPE	DESCRIPTION | RECOMMENDED SPECIFICATION
Structural Fill	Placed below structures, flatwork and pavement. Well-graded sand/gravel mixture, with maximum particle size of 4 inches, a minimum 70% passing 3/4-inch sieve, approximately 30% to 70% passing the No. 4 sieve, a maximum 20% passing the No. 200 sieve, and a maximum Plasticity Index of 10.
Site Grading Fill	Placed over large areas to raise the site grade. Sandy to gravelly soil, with a maximum particle size of 6 inches, a minimum 70% passing 3/4-inch sieve, a maximum 50% passing No. 200 sieve, and a maximum Plasticity Index of 15.
Non-Structural Fill	Placed below non-structural areas, such as landscaping. On-site soils or imported soils, with a maximum particle size of 8 inches, including silt/clay soils not containing excessive amounts of degradable/organic material (see discussion below).
Stabilization Fill	Placed to stabilize soft areas prior to placing structural fill and/or site grading fill. Coarse angular gravels and cobbles 1 inch to 8 inches in size. May also use 1.5- to 2.0-inch gravel placed on stabilization fabric, such as Mirafi RS280i, or equivalent (see **Section 6.6**).

Near-surface soils are not suitable for use as structural fill but may be used as site grading fill or non-structural fill. Note that silt/clay soils are inherently more difficult to work with in proper moisture conditioning (they are very sensitive to changes in moisture content), requiring very close moisture control during placement and compaction. This will be very difficult, if not impossible, during wet and cold periods of the year. We also recommend the site grading fill thickness using on-site silt/clay soils not exceed 3 feet below structures, to reduce potential settlements.

All fill material should be approved by a CMT geotechnical engineer prior to placement.

6.4 Fill Placement and Compaction

The various types of compaction equipment available have their limitations as to the maximum lift thickness that can be compacted. For example, hand operated equipment is limited to lifts of about 4 inches and most "trench compactors" have a maximum, consistent compaction depth of about 6 inches. Large rollers, depending on soil and moisture conditions, can achieve compaction at 8 to 12 inches. The full thickness of each lift should be compacted to at least the following percentages of the maximum dry density as determined by ASTM D-1557 (or AASHTO[5] T-180) in accordance with the following recommendations:

[5] American Association of State Highway and Transportation Officials

LOCATION	TOTAL FILL THICKNESS (FEET)	MINIMUM PERCENTAGE OF MAXIMUM DRY DENSITY
Beneath an area extending at least 4 feet beyond the perimeter of structures, and below flatwork and pavement (applies to structural fill and site grading fill) extending at least 2 feet beyond the perimeter	0 to 5 5 to 8	95 98
Site grading fill outside area defined above	0 to 5 5 to 8	92 95
Utility trenches within structural areas	--	96
Roadbase and subbase	-	96
Non-structural fill	0 to 5 5 to 8	90 92

Structural fills greater than 8 feet thick are not anticipated at the site. For best compaction results, we recommend that the moisture content for structural fill/backfill be within 2% of optimum. Field density tests should be performed on each lift as necessary to verify that proper compaction is being achieved.

6.5 Utility Trenches

For the bedding zone around the utility, we recommend utilizing sand bedding fill material that meets current APWA[6] requirements.

All utility trench backfill material below structurally loaded facilities (foundations, floor slabs, flatwork, parking lots/drive areas, etc.) should be placed at the same density requirements established for structural fill in the previous section.

Most utility companies and local governments are requiring Type A-1a or A-1b (AASHTO Designation) soils (sand/gravel soils with limited fines) be used as backfill over utilities within public rights of way, and the backfill be compacted over the full depth above the bedding zone to at least 96% of the maximum dry density as determined by AASHTO T-180 (ASTM D-1557).

Where the utility does not underlie structurally loaded facilities and public rights of way, natural soils may be utilized as trench backfill above the bedding layer, provided they are properly moisture conditioned and compacted to the minimum requirements stated above in **Section 6.4**.

6.6 Stabilization

The natural near surface silt/clay soils at this site will likely be susceptible to rutting and pumping. The likelihood of disturbance or rutting and/or pumping of the existing natural soils is a function of the moisture content, the load applied to the surface, as well as the frequency of the load. Consequently, rutting and pumping can be reduced by avoiding concentrated traffic, reducing the load applied to the surface by using lighter equipment

[6] American Public Works Association

and/or partial loads, by working in drier times of the year, or by providing a working surface for the equipment. Rubber-tired equipment particularly, because of high pressures, promotes instability in moist/wet, soft soils.

If rutting or pumping occurs, traffic should be stopped, and the disturbed soils should be removed and replaced with stabilization material. Typically, a minimum of 18 inches of the disturbed soils must be removed to be effective. However, deeper removal is sometimes required.

To stabilize soft subgrade conditions (if encountered), a mixture of coarse, clean, angular gravels and cobbles and/or 1.5- to 2.0-inch clean gravel should be utilized. This coarse material may be placed and worked into the soft soils until firm and non-yielding or the soft soils removed an additional, minimum of 18 inches, and backfilled with the clean stabilizing fill. A test area should be implemented to achieve a proper stabilization strategy. Often the amount of gravelly material can be reduced with the use of a geotextile fabric such as Mirafi RS280i, or equivalent. Its use will also help avoid mixing of the subgrade soils with the gravelly material. After excavating the soft/disturbed soils, the fabric should be spread across the bottom of the excavation and up the sides a minimum of 18 inches. Otherwise, it should be placed in accordance with the manufacturer's recommendation, including proper overlaps. The gravel material can then be placed over the fabric in compacted lifts as described above.

7.0 FOUNDATION RECOMMENDATIONS

The following recommendations have been developed on the basis of the previously described project characteristics, the subsurface conditions observed in the field and the laboratory test data, as well as common geotechnical engineering practice.

7.1 Continuous/Spread Footings

Based on our geotechnical engineering analyses, the proposed structure may be supported upon conventional spread and/or continuous wall foundations placed on suitable, undisturbed, uniform natural soils or entirely on structural fill extending to suitable natural soils. Footings may be designed using a net bearing pressure of 2,000 psf if placed on suitable, undisturbed, natural soils or 2,500 psf if placed on a minimum 18 inches of structural fill.

The term "net bearing pressure" refers to the pressure imposed by the portion of the structure located above lowest adjacent final grade, thus the weight of the footing and backfill to lowest adjacent final grade need not be considered. The allowable bearing pressure may be increased by 1/3 for temporary loads such as wind and seismic forces.

We also recommend the following:

1. Exterior footings subject to frost should be placed at least 30 inches below final grade.
2. Interior footings not subject to frost should be placed at least 16 inches below grade.
3. Continuous footing widths should be maintained at a minimum of 18 inches.
4. Isolated footings should be a minimum of 24 inches wide.

7.2 Installation

Under no circumstances shall foundations be placed on undocumented fill, topsoil with organics, sod, rubbish, construction debris, other deleterious materials, frozen soils, or within ponded water. If unsuitable soils are encountered, they must be completely removed and replaced with properly compacted structural fill.

Deep, large roots may be encountered where trees and larger bushes are located or were previously located at the site; such large roots should be removed. The base of footing excavations should be observed by a CMT geotechnical engineer to assess if suitable bearing soils have been exposed.

All structural fill placed immediately below footings should meet the requirements for such, and should be placed and compacted in accordance with **Section 6** above. The width of structural replacement fill below footings should be equal to the width of the footing plus 1 foot for each foot of fill thickness. For instance, if the footing width is 2 feet and the structural fill depth beneath the footing is 2 feet, the fill replacement width should be 4 feet, centered beneath the footing.

The minimum thickness of structural fill below footings should be equivalent to one-third the thickness of structural fill below any other portion of the foundations. For example, if the maximum depth of structural fill used for the backfill is 6 feet, all footings for the new structure should be underlain by a minimum 2 feet of structural fill.

7.3 Estimated Settlement

Foundations designed and constructed in accordance with our recommendations could experience settlement, but we anticipate that total settlements of footings founded as recommended above will not exceed 1 inch, with differential settlements on the order of 0.5 inches over a distance of 25 feet. We expect approximately 50% of the total settlement to initially take place during construction.

7.4 Lateral Resistance

Lateral loads imposed upon foundations due to wind or seismic forces may be resisted by the development of passive earth pressures and friction between the base of the footings and the supporting soils. In determining frictional resistance, a coefficient of 0.30 for natural silt soils or 0.40 for structural fill, may be utilized for design. Passive resistance provided by properly placed and compacted natural soils above the water table may be considered equivalent to a fluid with a density of 350 pcf. A combination of passive earth resistance and friction may be utilized if the passive resistance component of the total is divided by 1.5. Note that frictional resistance is mobilized as soon as any movement occurs, while full passive pressure is typically achieved after a small amount of movement occurs (approximately 0.5% of the footing height).

8.0 LATERAL EARTH PRESSURES

We anticipate that below-grade walls up to 4 feet high might be constructed at this site. The lateral earth pressure values given below are for a backfill material that will consist of drained natural silt/clay soils placed and compacted in accordance with the recommendations presented herein. If other soil types will be used as backfill, we should be notified so that appropriate modifications to these values can be provided, as needed.

The lateral pressures imposed upon subgrade facilities will depend upon the relative rigidity and movement of the backfilled structure. Following are the recommended lateral pressure values, which also assume that the soil surface behind the wall is horizontal and that the backfill within 3 feet of the wall will be compacted with hand-operated compacting equipment. For subgrade walls less than 12 feet high, employing a seismic at-rest lateral earth pressure for design is not needed.

CONDITION	STATIC (psf/ft)*	SEISMIC (psf/ft)**
Active Pressure (wall is allowed to yield, i.e. move away from the soil, with a minimum 0.001H movement/rotation at the top of the wall, where "H" is the total height of the wall)	38	39
At-Rest Pressure (wall is not allowed to yield)	58	N/A
Passive Pressure (wall moves into the soil)	350	195

*Equivalent Fluid Pressure (applied at 1/3 Height of Wall)

**Equivalent Fluid Pressure (added to static and applied at 1/3 Height of Wall)

9.0 FLOOR SLABS

Properly engineered floor slabs should be established upon uniform, compacted bearing soils comprised of suitable, undisturbed, uniform natural soils or on structural fill extending to suitable natural soils (same as for foundations). Under no circumstances shall floor slabs be established directly on any topsoil, undocumented fills (if encountered), loose or disturbed soils, sod, rubbish, construction debris, other deleterious materials, frozen soils, or within ponded water. Floor slabs should be properly designed by a structural engineer to accommodate anticipated loads.

To facilitate curing of the concrete, we recommend that floor slabs be directly underlain by at least 4 inches of moist aggregate base or bedding material, or "free-draining" fill such as "pea" gravel or 1-inch minus, clean, gap-graded gravel. To help control normal shrinkage and stress cracking, the floor slab thickness and joint layout should be designed by a qualified structural engineer. Design provisions should address the following features:

1. Adequate reinforcement for the anticipated floor loads;
2. Using smooth bar reinforcement for load transfer through interior floor joints;
3. Portland cement concrete mix design selection to minimize shrinkage concerns;
4. Joint layout and spacing in accordance with ACI[7] or other local standards recommendations; and
5. Properly isolate floor slabs from foundations and other structural elements per recommendations provided by ACI 302 (Guide to Concrete Floor and Slab Construction).

10.0 DRAINAGE RECOMMENDATIONS

It is important to the long-term performance of foundations and floor slabs that water is not allowed to collect near the foundation walls and infiltrate into the underlying soils. We recommend the following:

1. All areas around the structure should be sloped to provide drainage away from the foundations. We recommend a minimum slope of 4 inches in the first 10 feet away from the structure. This slope should be maintained throughout the lifetime of the structure.

2. All roof drainage should be collected in rain gutters with downspouts designed to discharge at least 10 feet from the foundation walls or well beyond the backfill limits, whichever is greater.

3. Adequate compaction of the foundation backfill should be provided. We suggest a minimum of 90% of the maximum laboratory density as determined by ASTM D-1557. Water consolidation methods should not be used under any circumstances.

4. Landscape sprinklers should be aimed away from the foundation walls. The sprinkling systems should be designed with proper drainage and be well-maintained. Over watering should be avoided.

5. Other precautions that may become evident during construction.

11.0 PAVEMENTS

All pavement areas must be prepared as discussed above in **Section 6.1**. Under no circumstances shall pavements be established over topsoil, undocumented fills (if encountered), loose or disturbed soils, sod, rubbish, construction debris, other deleterious materials, frozen soils, or within ponded water.

If encountered, and first observed by a CMT geotechnical engineer for approval, undocumented fill can remain in place in pavement areas if properly prepared. The owner must accept, depending on the thickness of any undocumented fills, which could vary, that additional maintenance may be required for surfaces constructed over undocumented fill soils. Proper preparation of undocumented fill and disturbed soils beneath pavement areas shall consist of removing the upper 12 inches for asphalt pavement or 18 inches for concrete pavement, scarifying the exposed surface to a minimum depth of 8 inches, properly moisture conditioning and recompacting the scarified soils in place. The removed fill, if free of debris, organics, or other deleterious

[7] American Concrete Institute

materials, may then be replaced in similarly compacted lifts. Prior to placement of pavement materials, the exposed subgrade must then be proof rolled by passing moderate-weight rubber tire-mounted construction equipment over the surface at least twice. If soft or loose soils are encountered, they must be removed (up to a maximum depth of 2 feet) and replaced with structural fill.

A California Bearing Ratio (CBR) test was performed on a bulk sample of the near surface soils collected in the vicinity of bore hole B-12, which indicated a CBR value of 16, likely due to the high sand content.

We anticipate the natural silt/clay soils will exhibit poor pavement support characteristics when saturated or nearly saturated. Based on our laboratory testing experience with similar soils, a CBR value of 3 is more appropriate, which we have utilized for the pavement designs provided. Given the projected traffic as discussed above in **Section 1.3**, the following pavement sections are recommended for the given ESAL's (18-kip equivalent single-axle loads) per day:

MATERIAL	PAVEMENT SECTION THICKNESS (inches)					
	PARKING AREAS (1 ESAL per day)			BUS/DRIVE AREAS (3 ESAL'S per day)		
Asphalt	3	3	---	4	4	---
Concrete	---	--	5	---	---	6
Road-Base (UTBC)	8	4	5	10	6	5
Subbase	0	6	0	0	6	0
Total Thickness	11	13	10	14	16	11

Untreated base course (UTBC), typically known as road-base, should conform to city specifications, or to 1-inch-minus UDOT specifications for A–1-a/NP, and have a minimum CBR value of 70%. Material meeting our specification for structural fill can be used for subbase, as long as the fines content (percent passing No. 200 sieve) does not exceed 15%. Roadbase and subbase material should be compacted as recommended above in **Section 6.4**. Asphalt material generally should conform to APWA requirements, having a ½-inch maximum aggregate size, a 75-gyration Superpave mix containing no more than 15% of recycled asphalt (RAP) and a PG58-28 binder.

The rigid pavement sections recommended above are for non-reinforced Portland cement concrete. Concrete should be designed in accordance with the American Concrete Institute (ACI) and joint details should conform to the Portland Cement Association (PCA) guidelines. The concrete should have a minimum 28-day unconfined compressive strength of 3,000 pounds per square inch and contain 6% ±1% air-entrainment.

For dumpster pads, we recommend a pavement section consisting of 6.5 inches of Portland cement concrete and 6 inches of aggregate base over properly prepared suitable natural subgrade or site grading structural fills extending to suitable natural soils. Dumpster pads constructed overlying undocumented fills must be avoided or heavily reinforced.

12.0 QUALITY CONTROL

We recommend that CMT be retained as part of a comprehensive quality control testing and observation program. With CMT onsite we can help facilitate implementation of our recommendations and address, in a timely manner, any subsurface conditions encountered which vary from those described in this report. Without such a program CMT cannot be responsible for application of our recommendations to subsurface conditions which may vary from those described herein. This program may include, but not necessarily be limited to, the following:

12.1 Field Observations

Observations should be completed during all phases of construction such as site preparation, foundation excavation, structural fill placement and concrete placement.

12.2 Fill Compaction

Compaction testing by CMT is required for all structural supporting fill materials. Maximum Dry Density (Modified Proctor, ASTM D-1557) tests should be requested by the contractor immediately after delivery of any fill materials. The maximum density information should then be used for field density tests on each lift as necessary to verify that the required compaction is being achieved.

12.3 Excavations

All excavation procedures and processes should be observed by a geotechnical engineer from CMT or his representative. In addition, for the recommendations in this report to be valid, all backfill and structural fill placed in trenches and all pavements should be density tested by CMT. We recommend that freshly mixed concrete be tested by CMT in accordance with ASTM designations.

13.0 LIMITATIONS

The recommendations provided herein were developed by evaluating the information obtained from the subsurface explorations and soils encountered therein. The exploration logs reflect the subsurface conditions only at the specific location at the particular time designated on the logs. Soil and ground water conditions may differ from conditions encountered at the actual exploration locations. The nature and extent of any variation in the explorations may not become evident until during the course of construction. If variations do appear, it may become necessary to re-evaluate the recommendations of this report after we have observed the variation.

Our professional services have been performed, our findings obtained, and our recommendations prepared in accordance with generally accepted geotechnical engineering principles and practices. This warranty is in lieu of all other warranties, either expressed or implied.

We appreciate the opportunity to be of service to you on this project. If we can be of further assistance or if you have any questions regarding this project, please do not hesitate to contact us at 801-590-0394. To schedule materials testing, please call 801-381-5141.

APPENDIX

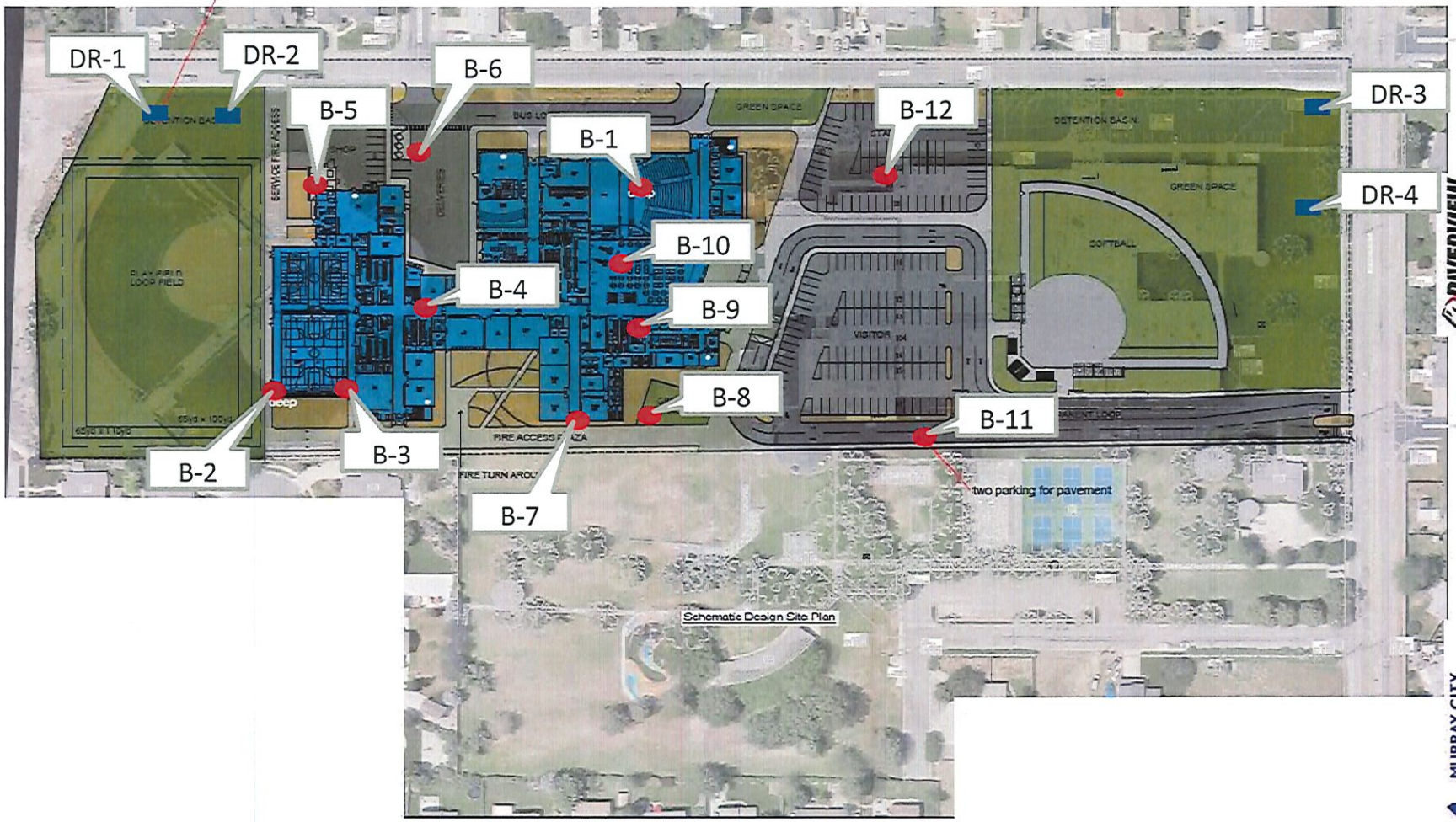
SUPPORTING
DOCUMENTATION

STRUCTURAL COMMENTS

we'd like the seismic site class to be determined by calculated values (instead of using the code-default value from insufficient test data). Also, we do not believe a site specific ground motion hazard analysis will be beneficial here.

CIVIL COMMENTS

KBS JOB – we need 4 double ring infiltration tests done per Size. I have roughly placed them above. I am not sure of the soil out there but it would be best to get the rates done at about a 6-12' elevation. If there is a granular area a little deeper from that elevation it may be better to get the rates at that location. Once the tests are run I need a recommended rate from them for us to use. If we don't have that I have to cut the actual rate in half to use for design.



CMT TECHNICAL SERVICES	**Riverview Jr High Replacement** About 751 Tripp Lane, Murray, Utah	**SITE PLAN**	Date:	13-Aug-2024	Figure: 1
			CMT No.:	22751	

Riverview Jr. High Replacement

Bore Hole Log B-1

About 751 Tripp Ln., Murray, UT

Total Depth: 51.5'
Water Depth: 22', 15'

Date: 8/6/24
Job #: 22751

Depth (ft)	GRAPHIC LOG	Soil Description	Sample Type	Sample #	Blows (N)	Total	Moisture (%)	Dry Density(pcf)	Gradation Gravel %	Gradation Sand %	Gradation Fines %	Atterberg LL	Atterberg PL	Atterberg PI
0		Topsoil												
		Brown SILT (ML) with interbedded silty sand layers, moist												
		stiff		1	6 8 17	25	30	93			96			
4														
				2	5 5 5	10	13		0	30	70	21	20	1
8				3	6 8 9	17	26	100						
		Brown Lean CLAY (CL) with interbedded silty sand layers, moist												
		soft to medium stiff		4	2 2 2	4	29				98	31	21	10
12														
		soft		5	1 1 1	2								
16														
		stiff		6	4 2 9	11								
20		wet												
24		soft		7	0 2 1	3	33				93	29	20	9
28														

Remarks: Groundwater encountered during drilling at depth of 22 feet and measured on 8/20/24 at depth of 15 feet.
Slotted PVC pipe installed to depth of 51.5 feet to facilitate water level measurements.

Coordinates: 40.645422°, -111.913062°
Surface Elev. (approx): Not Given

Equipment: Hollow-Stem Auger
Automatic Hammer, Wt=140 lbs, Drop=30"
Excavated By: Direct Push
Logged By: Christine Underdown
Page: 1 of 2

CMT TECHNICAL SERVICES

Figure: 2

Riverview Jr. High Replacement

Bore Hole Log **B-1**

About 751 Tripp Ln., Murray, UT

Total Depth: 51.5'
Water Depth: 22', 15'

Date: 8/6/24
Job #: 22751

Depth (ft)	Soil Description	Sample Type	Sample #	Blows (N)	Total	Moisture (%)	Dry Density(pcf)	Gradation Gravel %	Gradation Sand %	Gradation Fines %	Atterberg LL	Atterberg PL	Atterberg PI
28	Brown Lean CLAY (CL) with interbedded silty sand layers, moist												
	Gray Fat CLAY (CH), wet												
	soft		8	5 2 1	3								
32													
	very soft		9	8 0 0	0	34				98	51	20	31
36													
40	stiff to very stiff		10	6 8 8	16								
44	Gray Silty SAND (SM), wet												
	dense		11	8 23 25	48	12		0	70	30			
48													
	very dense		12	14 25 44	69								
52	END AT 51.5'												
56													

Remarks: Groundwater encountered during drilling at depth of 22 feet and measured on 8/20/24 at depth of 15 feet.
Slotted PVC pipe installed to depth of 51.5 feet to facilitate water level measurements.

Coordinates: 40.645422°, -111.913062°
Surface Elev. (approx): Not Given

Equipment: Hollow-Stem Auger
Automatic Hammer, Wt=140 lbs, Drop=30"
Excavated By: Direct Push
Logged By: Christine Underdown
Page: 2 of 2

CMT TECHNICAL SERVICES

Figure: 2

Riverview Jr. High Replacement

About 751 Tripp Ln., Murray, UT

Bore Hole Log B-2

Total Depth: 31.5'
Water Depth: (see Remarks)

Date: 8/6/24
Job #: 22751

Depth (ft)	GRAPHIC LOG	Soil Description	Sample Type	Sample #	Blows (N)	Total	Moisture (%)	Dry Density(pcf)	Gradation Gravel %	Gradation Sand %	Gradation Fines %	Atterberg LL	Atterberg PL	Atterberg PI
0		Sod												
		Brown Lean CLAY (CL) with interbedded silty sand layers, moist												
		medium stiff		13	2 3 2	5								
4														
		stiff		14	7 9 11	20	22	93	0	19	81			
8		grades very moist soft		15	3 1 2	3	31				96	32	20	12
				16	2 1 1	2								
12														
		soft to medium stiff		17	4 4 5	9	32	90			95			
16														
20		medium stiff		18	3 4 2	6	31				94	35	19	16
24														
				19	1 3 2	5								
28														

Remarks: Groundwater not encountered during drilling.

Coordinates: 40.644819°, -111.914551°
Surface Elev. (approx): Not Given

Equipment: Hollow-Stem Auger
Automatic Hammer, Wt=140 lbs, Drop=30"
Excavated By: Direct Push
Logged By: Christine Underdown
Page: 1 of 2

CMT TECHNICAL SERVICES

Figure: 3

Riverview Jr. High Replacement

Bore Hole Log **B-2**

About 751 Tripp Ln., Murray, UT

Total Depth: 31.5'
Water Depth: (see Remarks)

Date: 8/6/24
Job #: 22751

Depth (ft)	GRAPHIC LOG	Soil Description	Sample Type	Sample #	Blows (N)	Total	Moisture (%)	Dry Density(pcf)	Gradation Gravel %	Gradation Sand %	Gradation Fines %	Atterberg LL	Atterberg PL	Atterberg PI
28		Brown Lean CLAY (CL) with interbedded silty sand layers, moist												
		medium stiff		20	3 3 4	7								
		END AT 31.5'												
32														
36														
40														
44														
48														
52														
56														

Remarks: Groundwater not encountered during drilling.

Coordinates: 40.644819°, -111.914551°
Surface Elev. (approx): Not Given

Equipment: Hollow-Stem Auger
Automatic Hammer, Wt=140 lbs, Drop=30"
Excavated By: Direct Push
Logged By: Christine Underdown
Page: 2 of 2

CMT TECHNICAL SERVICES

Figure: 3

Riverview Jr. High Replacement

Bore Hole Log B-3

About 751 Tripp Ln., Murray, UT

Total Depth: 11.5'
Water Depth: (see Remarks)

Date: 8/6/24
Job #: 22751

Depth (ft)	GRAPHIC LOG	Soil Description	Sample Type	Sample #	Blows (N)	Total	Moisture (%)	Dry Density(pcf)	Gradation Gravel %	Gradation Sand %	Gradation Fines %	Atterberg LL	Atterberg PL	Atterberg PI
0		Topsoil												
		Brown Lean CLAY (CL) with sand, moist stiff		21	8 8 11	19								
		medium stiff		22	5 3 4	7	12		3	38	59			
4		soft		23	3 2 0	2								
		stiff		24	5 6 7	13	22				92			
				25	10 11 15	26	27	94						
8		END AT 11.5'												
12														
16														
20														
24														
28														

Remarks: Groundwater not encountered during drilling.

Coordinates: 40.644752°, -111.914038°
Surface Elev. (approx): Not Given

Equipment: Hollow-Stem Auger
Automatic Hammer, Wt=140 lbs, Drop=30"
Excavated By: Direct Push
Logged By: Christine Underdown
Page: 1 of 1

CMT TECHNICAL SERVICES

Figure: 4

Riverview Jr. High Replacement

Bore Hole Log **B-4**

About 751 Tripp Ln., Murray, UT

Total Depth: 11.5'
Water Depth: (see Remarks)

Date: 8/6/24
Job #: 22751

Depth (ft)	GRAPHIC LOG	Soil Description	Sample Type	Sample #	Blows (N)	Total	Moisture (%)	Dry Density(pcf)	Gradation Gravel %	Gradation Sand %	Gradation Fines %	Atterberg LL	Atterberg PL	Atterberg PI
0		Topsoil												
		Brown Lean CLAY (CL), trace gravel, moist												
		medium stiff		26	2 3 3	6								
4														
		stiff		27	10 11 10	21								
8		very stiff		28	9 9 9	18								
		stiff		29	3 5 5	10								
12		END AT 11.5'												
16														
20														
24														
28														

Remarks: Groundwater not encountered during drilling.

Coordinates: 40.645074°, -111.913775°
Surface Elev. (approx): Not Given

Equipment: Hollow-Stem Auger
Automatic Hammer, Wt=140 lbs, Drop=30"
Excavated By: Direct Push
Logged By: Christine Underdown
Page: 1 of 1

CMT TECHNICAL SERVICES

Figure: 5

Riverview Jr. High Replacement

Bore Hole Log **B-5**

About 751 Tripp Ln., Murray, UT

Total Depth: 11.5'
Water Depth: (see Remarks)

Date: 8/6/24
Job #: 22751

Depth (ft)	Soil Description	Sample Type	Sample #	Blows (N)	Total	Moisture (%)	Dry Density(pcf)	Gradation Gravel %	Gradation Sand %	Gradation Fines %	Atterberg LL	Atterberg PL	Atterberg PI
0	Sod												
	Brown Lean CLAY (CL) with sand, moist												
	stiff		30	5 7 11	18	21		0	31	69			
4													
			31	6 7 7	14								
	medium stiff												
8			32	2 2 3	5								
			33	2 3 3	6								
12	END AT 11.5'												
16													
20													
24													
28													

Remarks: Groundwater not encountered during drilling.

Coordinates: 40.645508°, -111.91422°
Surface Elev. (approx): Not Given

Equipment: Hollow-Stem Auger
Automatic Hammer, Wt=140 lbs, Drop=30"
Excavated By: Direct Push
Logged By: Christine Underdown
Page: 1 of 1

CMT TECHNICAL SERVICES

Figure: 6

Riverview Jr. High Replacement

About 751 Tripp Ln., Murray, UT

Bore Hole Log B-6

Total Depth: 16.5'
Water Depth: (see Remarks)
Date: 8/6/24
Job #: 22751

Depth (ft)	GRAPHIC LOG	Soil Description	Sample Type	Sample #	Blows (N)	Total	Moisture (%)	Dry Density(pcf)	Gradation Gravel %	Gradation Sand %	Gradation Fines %	Atterberg LL	Atterberg PL	Atterberg PI
0		Topsoil												
		Brown Silty SAND (SM), trace gravel, moist												
		loose		34	4 3 2	5								
4														
		medium dense		35	4 5 6	11	10		4	50	46			
8				36	5 7 9	16								
		Brown Lean CLAY (CL), moist medium stiff		37	4 4 3	7	29					32	21	11
12														
				38	5 6 7	13	30	91			99			
16		END AT 16.5'												
20														
24														
28														

Remarks: Groundwater not encountered during drilling.

Coordinates: 40.645624°, -111.913732°
Surface Elev. (approx): Not Given

Equipment: Hollow-Stem Auger
Automatic Hammer, Wt=140 lbs, Drop=30"
Excavated By: Direct Push
Logged By: Christine Underdown
Page: 1 of 1

CMT TECHNICAL SERVICES

Figure: 7

Riverview Jr. High Replacement

Bore Hole Log **B-7**

About 751 Tripp Ln., Murray, UT

Total Depth: 16.5'
Water Depth: (see Remarks)

Date: 8/6/24
Job #: 22751

Depth (ft)	GRAPHIC LOG	Soil Description	Sample Type	Sample #	Blows (N)	Total	Moisture (%)	Dry Density(pcf)	Gradation Gravel %	Gradation Sand %	Gradation Fines %	Atterberg LL	Atterberg PL	Atterberg PI
0		Topsoil												
		Brown Silty SAND (SM), moist												
		medium dense		39	5 5 6	11	4		3	78	19			
4				40	4 5 7	12								
8		Brown Lean CLAY (CL) with sand, moist .		41			26		0	18	82			
		medium stiff		42	4 2 3	5								
12														
		soft		43	2 1 2	3								
16		END AT 16.5'												
20														
24														
28														

Remarks: Groundwater not encountered during drilling.

Coordinates: 40.644681°, -111.9133113°
Surface Elev. (approx): Not Given

Equipment: Hollow-Stem Auger
Automatic Hammer, Wt=140 lbs, Drop=30"
Excavated By: Direct Push
Logged By: Christine Underdown
Page: 1 of 1

CMT TECHNICAL SERVICES

Figure: 8

Riverview Jr. High Replacement

About 751 Tripp Ln., Murray, UT

Bore Hole Log B-8

Total Depth: 11.5'
Water Depth: (see Remarks)

Date: 8/6/24
Job #: 22751

Depth (ft)	GRAPHIC LOG	Soil Description	Sample Type	Sample #	Blows (N)	Total	Moisture (%)	Dry Density(pcf)	Gradation Gravel %	Gradation Sand %	Gradation Fines %	Atterberg LL	Atterberg PL	Atterberg PI
0		Sod												
		Brown Silty SAND (SM), moist												
		loose		44	4 3 4	7	7		0	71	29			
4				45	5 5 4	9	4		5	78	17			
		loose to medium dense		46	3 4 6	10								
		loose		47	3 4 3	7								
12		END AT 11.5'												
16														
20														
24														
28														

Remarks: Groundwater not encountered during drilling.

Coordinates: 40.644734°, -111.91286°
Surface Elev. (approx): Not Given

Equipment: Hollow-Stem Auger
Automatic Hammer, Wt=140 lbs, Drop=30"
Excavated By: Direct Push
Logged By: Christine Underdown
Page: 1 of 1

CMT TECHNICAL SERVICES

Figure: 9

Riverview Jr. High Replacement

About 751 Tripp Ln., Murray, UT

Bore Hole Log B-9

Total Depth: 11.5'
Water Depth: (see Remarks)
Date: 8/6/24
Job #: 22751

Depth (ft)	GRAPHIC LOG	Soil Description	Sample Type	Sample #	Blows (N)	Total	Moisture (%)	Dry Density(pcf)	Gradation Gravel %	Gradation Sand %	Gradation Fines %	Atterberg LL	Atterberg PL	Atterberg PI
0		Sod												
		Brown Silty SAND (SM), moist												
		loose		48	4 3 4	7								
4				49	10 3 9	12	12	88	0	65	35			
8		Brown Lean CLAY (CL), trace sand, moist — medium stiff		50	2 3 2	5								
		grades very moist		51	2 2 3	5	31				97			
12		END AT 11.5'												
16														
20														
24														
28														

Remarks: Groundwater not encountered during drilling.

Coordinates: 40.645545°, -111.912882°
Surface Elev. (approx): Not Given

Equipment: Hollow-Stem Auger
Automatic Hammer, Wt=140 lbs, Drop=30"
Excavated By: Direct Push
Logged By: Christine Underdown
Page: 1 of 1

CMT TECHNICAL SERVICES

Figure: 10

Riverview Jr. High Replacement

Bore Hole Log B-10

About 751 Tripp Ln., Murray, UT

Total Depth: 11.5'
Water Depth: (see Remarks)

Date: 8/6/24
Job #: 22751

Depth (ft)	GRAPHIC LOG	Soil Description	Sample Type	Sample #	Blows (N)	Total	Moisture (%)	Dry Density(pcf)	Gradation Gravel %	Gradation Sand %	Gradation Fines %	Atterberg LL	Atterberg PL	Atterberg PI
0		Sod												
		Brown Sandy SILT (ML), trace gravel, moist												
		stiff		52	2 4 5	9								
4														
				53	4 3 4	7	16		1	40	59			
8		Brown Lean CLAY (CL), trace sand, moist stiff		54	4 8 11	19	25	97			96	33	21	12
				55	2 2 3	5								
12		END AT 11.5'												
16														
20														
24														
28														

Remarks: Groundwater not encountered during drilling.

Coordinates: 40.645204°, -111.912994°
Surface Elev. (approx): Not Given

Equipment: Hollow-Stem Auger
Automatic Hammer, Wt=140 lbs, Drop=30"
Excavated By: Direct Push
Logged By: Christine Underdown
Page: 1 of 1

CMT TECHNICAL SERVICES

Figure: 11

Riverview Jr. High Replacement

Bore Hole Log B-11

About 751 Tripp Ln., Murray, UT

Total Depth: 6.5'
Water Depth: (see Remarks)

Date: 8/6/24
Job #: 22751

Depth (ft)	GRAPHIC LOG	Soil Description	Sample Type	Sample #	Blows (N)	Total	Moisture (%)	Dry Density(pcf)	Gradation Gravel %	Gradation Sand %	Gradation Fines %	Atterberg LL	Atterberg PL	Atterberg PI
0		4" Aggregate Base												
		Brown Sandy SILT (ML), moist stiff		56	7 7 5	12								
		medium stiff		57	5 3 2	5	19		0	31	69			
4				58	4 3 3	6								
		END AT 6.5'												
8														
12														
16														
20														
24														
28														

Remarks: Groundwater not encountered during drilling.

Coordinates: 40.644683°, -111.911964°
Surface Elev. (approx): Not Given

Equipment: Hollow-Stem Auger
Automatic Hammer, Wt=140 lbs, Drop=30"
Excavated By: Direct Push
Logged By: Christine Underdown
Page: 1 of 1

CMT TECHNICAL SERVICES

Figure: 12

Riverview Jr. High Replacement

Bore Hole Log B-12

About 751 Tripp Ln., Murray, UT

Total Depth: 6.5'
Water Depth: (see Remarks)

Date: 8/6/24
Job #: 22751

Depth (ft)	GRAPHIC LOG	Soil Description	Sample Type	Sample #	Blows (N)	Total	Moisture (%)	Dry Density(pcf)	Gradation Gravel %	Gradation Sand %	Gradation Fines %	Atterberg LL	Atterberg PL	Atterberg PI
0		Sod												
		Brown Sandy SILT (ML)/Silty SAND (SM), moist												
				59					0	50	50			
		grades Silty SAND (SM) loose		60	3 4 4	8	11		0	75	25			
4														
				61	2 3 5	8								
		END AT 6.5'												
8														
12														
16														
20														
24														
28														

Remarks: Groundwater not encountered during drilling.

Coordinates: °, °

Surface Elev. (approx): Not Given

Equipment: Hollow-Stem Auger
Automatic Hammer, Wt=140 lbs, Drop=30"
Excavated By: Direct Push
Logged By: Christine Underdown
Page: 1 of 1

CMT TECHNICAL SERVICES

Figure: 13

Riverview Jr. High Replacement

Bore Hole Log B-13

About 751 Tripp Ln., Murray, UT

Total Depth: 6.5'
Water Depth: (see Remarks)

Date: 8/6/24
Job #: 22751

Depth (ft)	GRAPHIC LOG	Soil Description	Sample Type	Sample #	Blows (N)	Total	Moisture (%)	Dry Density(pcf)	Gradation Gravel %	Gradation Sand %	Gradation Fines %	Atterberg LL	Atterberg PL	Atterberg PI
0		Sod												
		Brown Sandy SILT (ML), moist												
		medium stiff		62	4 3 3	6								
4														
				63	4 3 4	7	19		0	42	58			
		END AT 6.5'												
8														
12														
16														
20														
24														
28														

Remarks: Groundwater not encountered during drilling.

Coordinates: °, °
Surface Elev. (approx): Not Given

Equipment: Hollow-Stem Auger
Automatic Hammer, Wt=140 lbs, Drop=30"
Excavated By: Direct Push
Logged By: Christine Underdown
Page: 1 of 1

CMT TECHNICAL SERVICES

Figure: 14

Riverview Jr. High Replacement

About 751 Tripp Ln., Murray, UT

Key to Symbols

Date: 8/6/24

Job #: 22751

① Depth (ft)	② GRAPHIC LOG	③ Soil Description	④ Sample Type	⑤ Sample #	Blows(N) ⑥	Blows(N) ⑦ Total	⑧ Moisture (%)	⑨ Dry Density(pcf)	Gradation ⑩ Gravel %	Gradation ⑩ Sand %	Gradation ⑩ Fines %	Atterberg ⑪ LL	Atterberg ⑪ PL	Atterberg ⑪ PI

COLUMN DESCRIPTIONS

① **Depth (ft.):** Depth (feet) below the ground surface (including groundwater depth - see below right).

② **Graphic Log:** Graphic depicting type of soil encountered (see ② below).

③ **Soil Description:** Description of soils, including Unified Soil Classification Symbol (see below).

④ **Sample Type:** Type of soil sample collected; sampler symbols are explained below-right.

⑤ **Sample #:** Consecutive numbering of soil samples collected during field exploration.

⑥ **Blows:** Number of blows to advance sampler in 6" increments, using a 140-lb hammer with 30" drop.

⑦ **Total Blows:** Number of blows to advance sampler the 2nd and 3rd 6" increments.

⑧ **Moisture (%):** Water content of soil sample measured in laboratory (percentage of dry weight).

⑨ **Dry Density (pcf):** The dry density of a soil measured in laboratory (pounds per cubic foot).

⑩ **Gradation:** Percentages of Gravel, Sand and Fines (Silt/Clay), from lab test results of soil passing No. 4 and No. 200 sieves.

⑪ **Atterberg:** Individual descriptions of Atterberg Tests are as follows:

LL = Liquid Limit (%): Water content at which a soil changes from plastic to liquid behavior.

PL = Plastic Limit (%): Water content at which a soil changes from liquid to plastic behavior.

PI = Plasticity Index (%): Range of water content at which a soil exhibits plastic properties (= Liquid Limit - Plastic Limit).

STRATIFICATION	
Description	**Thickness**
Seam	Up to ½ inch
Lense	Up to 12 inches
Layer	Greater than 12 in.
Occasional	1 or less per foot
Frequent	More than 1 per foot

MODIFIERS
Trace
<5%
Some
5-12%
With
> 12%

MOISTURE CONTENT
Dry: Absence of moisture, dusty, dry to the touch.
Moist: Damp / moist to the touch, but no visible water.
Saturated: Visible water, usually soil below groundwater.

UNIFIED SOIL CLASSIFICATION SYSTEM (USCS)

MAJOR DIVISIONS			USCS SYMBOLS	②	TYPICAL DESCRIPTIONS
COARSE-GRAINED SOILS More than 50% of material is larger than No. 200 sieve size.	GRAVELS The coarse fraction retained on No. 4 sieve.	CLEAN GRAVELS (< 5% fines)	GW		Well-Graded Gravels, Gravel-Sand Mixtures, Little or No Fines
			GP		Poorly-Graded Gravels, Gravel-Sand Mixtures, Little or No Fines
		GRAVELS WITH FINES (≥ 12% fines)	GM		Silty Gravels, Gravel-Sand-Silt Mixtures
			GC		Clayey Gravels, Gravel-Sand-Clay Mixtures
	SANDS The coarse fraction passing through No. 4 sieve.	CLEAN SANDS (< 5% fines)	SW		Well-Graded Sands, Gravelly Sands, Little or No Fines
			SP		Poorly-Graded Sands, Gravelly Sands, Little or No Fines
		SANDS WITH FINES (≥ 12% fines)	SM		Silty Sands, Sand-Silt Mixtures
			SC		Clayey Sands, Sand-Clay Mixtures
FINE-GRAINED SOILS More than 50% of material is smaller than No. 200 sieve size.	SILTS AND CLAYS Liquid Limit less than 50%		ML		Inorganic Silts and Very Fine Sands, Silty or Clayey Fine Sands or Clayey Silts with Slight
			CL		Inorganic Clays of Low to Medium Plasticity, Gravelly Clays, Sandy Clays, Silty Clays, Lean
			OL		Organic Silts and Organic Silty Clays o f Low Plasticity
	SILTS AND CLAYS Liquid Limit greater than 50%		MH		Inorganic Silts, Micacious or Diatomacious Fine Sand or Silty Soils with Plasticity (Elastic Silts)
			CH		Inorganic Clays of High Plasticity, Fat Clays
			OH		Organic Silts and Organic Clays of Medium to High Plasticity
HIGHLY ORGANIC SOILS			PT		Peat, Humus, Swamp Soils with High Organic Contents

Note: Dual Symbols are used to indicate borderline soil classifications (i.e. GP-GM, SC-SM, etc.).

SAMPLER SYMBOLS

- Block Sample
- Bulk/Bag Sample
- Modified California Sampler 3.5" OD, 2.42" ID
- D&M Sampler
- Rock Core
- Standard Penetration Split Spoon Sampler
- Thin Wall (Shelby Tube)

WATER SYMBOL

- Encountered Water Level
- Measured Water Level (see Remarks on Logs)

1. The results of laboratory tests on the samples collected are shown on the logs at the respective sample depths.
2. The subsurface conditions represented on the logs are for the locations specified. Caution should be exercised if interpolating between or extrapolating beyond the exploration locations.
3. The information presented on each log is subject to the limitations, conclusions, and recommendations presented in this report.

CMT TECHNICAL SERVICES

Figure: 15

SECTION 31 1000

SITE CLEARING

PART 1 GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

A. This Section includes the following:
   1. Removing existing vegetation as indicated on demolition plan.
   2. Clearing and grubbing.
   3. Stripping and stockpiling topsoil.
   4. Removing above and below-grade site improvements.
   5. Disconnecting, capping or sealing, abandoning site utilities in place, and removing site utilities.
   6. Temporary erosion and sedimentation control measures.

B. Related Sections include the following:
   1. Division 01 Section "Temporary Facilities and Controls" for temporary utilities, temporary construction and support facilities, temporary security, protection facilities, and temporary erosion and sedimentation control procedures.
   2. Division 02 Section "Selective Site Demolition" for demolition of buildings, structures, and site improvements.
   3. Division 31 Section "Earth Moving" for soil materials, excavating, backfilling, and site grading.

1.03 DEFINITIONS

A. Topsoil: Natural or cultivated surface-soil layer containing organic matter and sand, silt, and clay particles; friable, pervious, and black or a darker shade of brown, gray, or red than underlying subsoil; reasonably free of subsoil, clay lumps, gravel, and other objects more than 2 inches in diameter; and free of subsoil and weeds, roots, toxic materials, or other non-soil materials.

1.04 MATERIAL OWNERSHIP

A. Except for stripped topsoil or other materials indicated to remain on Owner's property, cleared materials shall become Contractor's property and shall be removed from Project site. Stripped topsoil shall only be removed from the property upon approval from the Owner.

1.05 SUBMITTALS

A. Photographs or videotape, sufficiently detailed, of existing conditions of trees and plantings, adjoining construction, and site improvements that might be misconstrued as damage caused by site clearing.

B. Record drawings, according to Division 01 Section "Project Record Documents," identifying and accurately locating capped utilities and other subsurface structural, electrical, and mechanical conditions.

1.06 QUALITY ASSURANCE

A. Pre-installation Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination."

1.07 PROJECT CONDITIONS

A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during site-clearing operations.
   1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction.
   2. Provide alternate routes around closed or obstructed traffic ways if required by authorities having jurisdiction.

B. Improvements on Adjoining Property: Authority for performing site clearing indicated on property adjoining Owner's property will be obtained by Owner before award of Contract.
   1. Do not proceed with work on adjoining property until directed by Architect.

C. Salvable Improvements: Carefully remove items indicated to be salvaged and store on Owner's premises where indicated.

D. Utility Locator Service: Notify utility locator service for area where Project is located before site clearing.

E. Do not commence site clearing operations until temporary erosion and sedimentation control measures are in place.

PART 2 PRODUCTS

2.01 SOIL MATERIALS

A. Satisfactory Soil Materials: Requirements for satisfactory soil materials are specified in Division 31 Section "Earth Moving."
   1. Obtain approved borrow soil materials off-site when satisfactory soil materials are not available on-site.

PART 3 EXECUTION

3.01 PREPARATION

A. Protect and maintain benchmarks and survey control points from disturbance during construction.

B. Locate and clearly flag trees and vegetation to remain or to be relocated.

C. Protect existing site improvements to remain from damage during construction.
   1. Restore damaged improvements to their original condition, as acceptable to Owner.

3.02 TEMPORARY EROSION AND SEDIMENTATION CONTROL

A. Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to requirements of authorities having jurisdiction, sediment and erosion control Drawings, a sediment and erosion control plan, specific to the site, that complies with EPA 832/R-92-005 or requirements of authorities having jurisdiction, whichever is more stringent.

B. Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.

C. Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

3.03 UTILITIES

A. Owner will arrange for disconnecting and sealing indicated utilities that serve existing structures before site clearing, when requested by Contractor.
   1. Verify that utilities have been disconnected and capped before proceeding with site clearing.
B. Locate, identify, disconnect, and seal or cap off utilities indicated to be removed.
   1. Arrange with utility companies to shut off indicated utilities.
   2. Owner will arrange to shut off indicated utilities when requested by Contractor.
C. Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:
   1. Notify Architect not less than two days in advance of proposed utility interruptions.
   2. Do not proceed with utility interruptions without Architect's written permission.
D. Excavate for and remove underground utilities indicated to be removed.
E. Removal of underground utilities is included in Division 21, Division 22, Division 26, Division 27, and Division 28 Sections covering site utilities.

3.04 CLEARING AND GRUBBING

A. Remove obstructions such as shrubs, grass, and other vegetation to permit installation of new construction.
B. Fill depressions caused by clearing and grubbing operations with satisfactory soil material unless further excavation or earthwork is indicated.
   1. Place fill material in horizontal layers not exceeding a loose depth of 8 inches and compact each layer to a density equal to adjacent original ground.

3.05 TOPSOIL STRIPPING

A. Remove top 1-2” of soil including all weeds, grass, brush and other vegetation and haul this material off-site before stripping topsoil. Actual depth of soil removal from site may vary depending on the amount of roots and plant material in the top 1-6” of soil. The base bid shall be to strip up to 3” of soil, etc. from the site and dispose of it off-site. If additional material is deemed necessary for removal from the site, a change order will be issued. Consult with Landscape Architect on-site prior to stripping soil so that a visual inspection can be done. Contractor shall review the topsoil report already completed with the Landscape Architect at this meeting. See appendix ‘A’ for topsoil report.
B. Strip only from 3” depth to 12” depth (the first 1-3” being disposed off-site) of topsoil in a manner to prevent intermingling with underlying subsoil or other waste materials. This depth of topsoil stripping may need to be modified based on the results of the topsoil test noted above and also based on observations at the meeting to be held on-site as discussed above. The contractor shall calculate how much soil is needed for the lawn areas and planter areas and then only needs to strip that much soil (less the amendments).
   1. Remove subsoil and non-soil materials from topsoil by screening all topsoil from trash, debris, weeds, roots, and other waste materials greater than ½ inch in any dimension.
   2. Amount of topsoil that needs to be stockpiled shall be determined by the following:
      a. Strip all soils under buildings, structures, hardscaped/paved areas per civil, architectural, mechanical and structural drawings.
      b. Strip enough topsoil based on quantity needed to install 4” depth of amended soil in lawn areas and 12” depth of amended soil in planter areas.
      c. Topsoil depths in lawn and planter areas may be deeper than noted if at no additional cost to the Owner.

C. Stockpile stripped topsoil materials away from edge of excavations without intermixing with subsoil. Grade and shape stockpiles to drain surface water. Cover to prevent windblown dust.
   1. Limit height of topsoil stockpiles to 6 feet.
   2. Do not stockpile topsoil within tree protection zones.
   3. Minimize overworking of topsoil so that physical properties of topsoil are retained. Topsoil should be stripped and piled in a location that will not interfere with construction. Topsoil shall not be moved from location to location. Topsoil shall not be driven over with any equipment. Overworking of topsoil may invalidate the reuse of it for landscaping purposes. If topsoil is unusable due to overworking it, moving it, driving over it unnecessarily, etc, contractor shall at his own expense import topsoil to replace damaged topsoil as required. Contractor shall also bear the expense of disposal of any unusable stripped topsoil. Landscape contractor shall provide a second soils test for stockpiled topsoil prior to reuse in landscaped areas. Adjustments may need to be made to amendments depending on results of topsoil test.
   4. Dispose of excess topsoil as specified for waste material disposal as directed by the Owner. Owner retains all rights to stripped topsoil. Owner shall approve any removal of stripped topsoil from site however the contractor shall bear the cost to remove such soil as approved by the Owner.
   5. Stockpile surplus topsoil to allow for landscaping per plans. Depths of topsoil in lawn areas can be deeper than what is specified if excess soils are available for the extra depths, however, the Civil engineer must approve this and determine that all grading and drainage requirements can still be met by having deeper topsoil depths in lawn areas. Consult with Owner and Civil Engineer on-site prior to site work to discuss this and determine appropriate course of action to be taken.

3.06 SITE IMPROVEMENTS

A. Remove existing above-grade and below-grade improvements as indicated and as necessary to facilitate new construction. Refer to project plans for improvements to be abandoned in place.
B. Remove slabs, paving, curbs, gutters, and aggregate base as indicated.
   1. Unless existing full-depth joints coincide with line of demolition, neatly saw-cut length of existing pavement to remain before removing existing pavement. Saw-cut faces vertically.
   2. Paint cut ends of steel reinforcement in concrete to remain to prevent corrosion.

3.07 DISPOSAL

A. Disposal: Remove surplus soil material, unsuitable topsoil, obstructions, demolished materials, and waste materials including trash and debris, and legally dispose of them off Owner's property.
   1. Separate recyclable materials produced during site clearing from other non-recyclable materials. Store or stockpile without intermixing with other materials and transport them to recycling facilities.

END OF SECTION 31 1000

SECTION 31 2000

EARTH MOVING

PART 1 GENERAL

1.01 REFERENCE STANDARDS

A. ASTM D448 - Standard Classification for Sizes of Aggregate for Road and Bridge Construction; 2012 (Reapproved 2017).
B. ASTM D1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft3 (2,700 kN-m/m3)); 2012 (Reapproved 2021).
C. ASTM D2487 - Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System); 2017, with Editorial Revision (2020).

1.02 SUMMARY

A. This Section includes the following:
   1. Preparing subgrades for slabs-on-grade, walks, pavements, lawns and grasses and exterior plants.
   2. Subbase course for concrete walks and pavements.
   3. Subbase and base course for asphalt paving.
   4. Subsurface drainage backfill for walls and trenches.
   5. Excavation and backfilling for buildings and structures.
   6. Excavation and backfilling for utility trenches.
B. Related Sections include the following:
   1. Division 1 Section "Temporary Facilities and Controls" for temporary controls, utilities, and support facilities.
   2. Division 2 Section "Site Clearing" for temporary erosion and sedimentation control measures, site stripping, grubbing, stripping and stockpiling topsoil, and removal of above- and below-grade improvements and utilities.
   3. Division 2 Section "Dewatering" for lowering and disposing of ground water during construction.
   4. Division 2 Section "Excavation Support and Protection" for shoring, bracing, and sheet piling of excavations.
   5. Division 2 Section "Exterior Plants" for planting bed establishment and tree and shrub pit excavation and planting.
   6. Division 3 Section "Cast-in-Place Concrete" for granular course if placed over vapor retarder and beneath the slab-on-grade.

1.03 DEFINITIONS

A. Backfill: Soil material or controlled low-strength material used to fill an excavation.
   1. Initial Backfill: Backfill placed beside and over pipe in a trench, including haunches to support sides of pipe.
   2. Final Backfill: Backfill placed over initial backfill to fill a trench.
B. Base Course: Course placed between the subbase course and hot-mix asphalt paving.
C. Bedding Course: Course placed over the excavated subgrade in a trench before laying pipe.
D. Borrow Soil: Satisfactory soil imported from off-site for use as fill or backfill.
E. Drainage Course: Course supporting the slab-on-grade that also minimizes upward capillary flow of pore water.
F. Excavation: Removal of material encountered above subgrade elevations and to lines and dimensions indicated.

1. Authorized Additional Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions as directed by Architect. Authorized additional excavation and replacement material will be paid for according to Contract provisions for changes in the Work.
2. Bulk Excavation: Excavation more than 10 feet in width and more than 30 feet in length.
3. Unauthorized Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions without direction by Architect. Unauthorized excavation, as well as remedial work directed by Architect, shall be without additional compensation.

G. Fill: Soil materials used to raise existing grades.

H. Rock: Rock material in beds, ledges, unstratified masses, conglomerate deposits, and boulders of rock material 3/4 cu. yd. or more in volume that exceed a standard penetration resistance of 100 blows/2 inches when tested by an independent geotechnical testing agency, according to ASTM D 1586.

I. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.

J. Subbase Course: Course placed between the subgrade and base course for hot-mix asphalt pavement, or course placed between the subgrade and a cement concrete pavement or a cement concrete or hot-mix asphalt walk.

K. Subgrade: Surface or elevation remaining after completing excavation, or top surface of a fill or backfill immediately below subbase, drainage fill, or topsoil materials.

L. Utilities: On-site underground pipes, conduits, ducts, and cables, as well as underground services within buildings.

1.04 SUBMITTALS

A. Product Data: For the following:
   1. Each type of plastic warning tape.

B. Material Test Reports: From a qualified testing agency indicating and interpreting test results for compliance of the following with requirements indicated:
   1. Classification according to ASTM D2487 of each on-site and borrow soil material proposed for fill and backfill.
   2. Laboratory compaction curve according to ASTM D1557 for each on-site and borrow soil material proposed for fill and backfill.

C. Preexcavation Photographs or Videotape: Show existing conditions of adjoining construction and site improvements, including finish surfaces that might be misconstrued as damage caused by earthwork operations. Submit before earthwork begins.

1.05 QUALITY ASSURANCE

A. Preexcavation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Management and Coordination."

1.06 PROJECT CONDITIONS

A. Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted in writing by Architect and then only after arranging to provide temporary utility services according to requirements indicated.
   1. Notify Architect not less than two days in advance of proposed utility interruptions.
   2. Do not proceed with utility interruptions without the Architect’s written permission.
   3. Contact utility-locator service for area where Project is located before excavating.

B. Demolish and completely remove from site existing underground utilities indicated to be removed. Coordinate with utility companies to shut off services if lines are active.

PART 2 PRODUCTS

2.01 SOIL MATERIALS

A. General: Provide borrow soil materials when sufficient satisfactory soil materials are not available from excavations. Use imported structural fill for structurally loaded areas and pavements. All earthwork shall be in accordance with the project geotechnical study.
B. Satisfactory Soils: ASTM D2487 Soil Classification Groups GW, GP, GM, SW, SP, and SM, or a combination of these groups; free of rock or gravel larger than 6 inches in any dimension, debris, waste, frozen materials, vegetation, and other deleterious matter. Min 70% passing the ¾" sieve and max passing No. 200 Sieve with a max Plasticity Index is set at 10 max.
C. Unsatisfactory Soils: Soil Classification Groups GC, SC, CL, ML, OL, CH, MH, OH, and PT according to ASTM D2487, or a combination of these groups.
    1. Unsatisfactory soils also include satisfactory soils not maintained within 2 percent of optimum moisture content at time of compaction.
D. Imported Structural Fill and Backfill: Naturally occurring or artificially graded mixture of sands and gravels (non-expansive granular soil), free of organics, vegetation, sod, trash, frozen materials, clay clods or other deleterious materials such as trash, frozen clods, clay clods, etc. Per the geotechnical report recommendations, structural fill under footings, floor slab, and slab support shall have 100% passing the 4" sieve, a minimum 70% passing ¾-inch sieve, approximately 30% to 70% passing No. 4 sieve, and 20% max passing the No. 200 Sieve. Plasticity Index is set at 10 max. Structural Fill should be well-graded with a maximum particle size of 4 inches.
E. Base Course at all Site Concrete Work: Sound, crushed, or uncrushed rock or gravel and sand, well graded as follows: (refer to APWA specs for base course.)
F. Sieve % by Weight Passing Sieve
G. 1 1/2" 100
H. 1" 90 -100
I. ¾" 70 – 85
J. ½" 60 – 80
K. 3/8" 55 – 75
L. #4 40-65
M. #16 25 – 40
N. #200 7 – 11 (non-plastic)
O. Provide a 4-inch minimum of base course material beneath all site concrete work.
P. Bedding Course: Type A-1-a or A-1-b (AASHTO Classifications soils per City Requirements.)
Q. Drainage Course: Narrowly graded mixture of sand, crushed stone, or crushed or uncrushed gravel; ASTM D448; coarse-aggregate grading Size 57; with 100 percent passing a 1-1/2-inch sieve and 0 to 5 percent passing a No. 200 sieve. Provide a minimum of 4-inch depth under all concrete building slab areas or as shown on plans.
R. Cobble Material: Naturally or artificially graded mixture of angular rock. 4" to 12" in diameter.
S. Drain Rock: For Fill in submerged area 3" Minus washed rock and pea gravel material with 0-25 passing the No 10, 0-15 Passing the No 40 and 0-5 Passing the No 200 Non-Plastic should be used. If free draining fill is adjacent to soil containing a significant amount of sand or silt/clay, precautions should be taken to prevent the migration of fine soil into the free drain fill. This would include the use of filter fabric between the two soil types. Fabric to be approved by geotechnical engineer.

2.02 ACCESSORIES

A. Detectable Warning Tape: Acid- and alkali-resistant polyethylene film warning tape manufactured for marking and identifying underground utilities, a minimum of 6 inches wide and 4 mils thick, continuously inscribed with a description of the utility, with metallic core encased in a protective jacket for corrosion protection, detectable by metal detector when tape is buried up to 30 inches deep; colored as follows:
   1. Red: Electric.
   2. Yellow: Gas, oil, steam, and dangerous materials.
   3. Orange: Telephone and other communications.
   4. Blue: Water systems.
   5. Green: Sewer systems.

PART 3 EXECUTION

3.01 PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earthwork operations.
B. Preparation of subgrade for earthwork operations including removal of vegetation, topsoil, debris, obstructions, and deleterious materials from ground surface is specified in Division 2 Section "Site Clearing."
C. Protect and maintain erosion and sedimentation controls, which are specified in Division 2 Section "Site Clearing," during earthwork operations.
D. Provide protective insulating materials to protect subgrades and foundation soils against freezing temperatures or frost.

3.02 DEWATERING

A. Prevent surface water and ground water from entering excavations, from ponding on prepared subgrades, and from flooding Project site and surrounding area.
B. Pump ground water out of excavations and dispose of ground water in accordance with City requirements.
C. Protect subgrades from softening, undermining, washout, and damage by rain or water accumulation.
   1. Reroute surface water runoff away from excavated areas. Do not allow water to accumulate in excavations. Do not use excavated trenches as temporary drainage ditches.

3.03 EXPLOSIVES

A. Explosives: The use of explosives is NOT allowed, unless specifically permitted by City Officials.

3.04 EXCAVATION, GENERAL

A. Unclassified Excavation: Excavate to subgrade elevations regardless of the character of surface and subsurface conditions encountered. Unclassified excavated materials may include rock, soil materials, and obstructions. No changes in the Contract Sum or the Contract Time will be authorized for rock excavation or removal of obstructions.
   1. If excavated materials intended for fill and backfill include unsatisfactory soil materials and rock, replace with satisfactory soil materials.

3.05 EXCAVATION FOR STRUCTURES

A. Excavate to indicated elevations and dimensions within a tolerance of plus or minus 1 inch. If applicable, extend excavations a sufficient distance from structures for placing and removing concrete formwork, for installing services and other construction, and for inspections. Refer to geotechnical report for any over excavation requirements and depth of required structural fill for footing. All unconsolidated fill found on site and indicated in the geotechnical report must be removed beneath footings.
   1. Excavations for Footings and Foundations: Do not disturb bottom of excavation. Excavate by hand to final grade just before placing concrete reinforcement. Trim bottoms to required lines and grades to leave solid base to receive other work. Bottom of excavation to be compacted with a minimum of 4 passes of an approved non vibratory roller prior to erection of forms or placement of structural fill. If soft spots are encountered over excavate and stabilize as recommended in the geotechnical report.
   2. Excavations below or near ground water elevations (within 12” of ground water) shall extend below the footing, foundation or structure a minimum of 24” or as indicated in the plans and backfilled with cobble and drainage rock to stabilize the foundation support. End dump cobble and spread to a maximum of 15” loose lifts and compact cobbles by dropping a backhoe bucket uniformly over the surface at least 3 times. The first layer of structural backfill shall be “worked into” the underlying open graded fill to reduce long term settlement of the fill material. Provide drainage fabric separation when shown on plans.
   3. Excavation for Underground Basins, and Mechanical or Electrical Utility Structures: Excavate to elevations and dimensions indicated within a tolerance of plus or minus 1 inch. Do not disturb bottom of excavations intended as bearing surfaces.
   4. Excavate 12” deeper than the required elevation required in rock areas or unyielding bearing material and backfill with imported engineered fill.

3.06 EXCAVATION FOR WALKS AND PAVEMENTS

A. Excavate surfaces under walks and pavements to indicated lines, cross sections, elevations, and subgrades. Subgrade to be prepared by proof-rolling to a firm non yielding surface to identify soft spots. If soft spots are encountered over excavate and stabilize as recommended in the geotechnical report (2’ deep replacement min.)

3.07 EXCAVATION FOR UTILITY TRENCHES

A. Excavate trenches to indicated gradients, lines, depths, and elevations.
   1. Beyond building perimeter, excavate trenches to allow installation of top of pipe below frost line.

B. Excavate trenches to uniform widths to provide the following clearance on each side of pipe or conduit. Excavate trench walls vertically from trench bottom to 12 inches higher than top of pipe or conduit, unless otherwise indicated.
   1. Clearance: 12 inches each side of pipe or conduit.

C. Trench Bottoms: Excavate trenches 4 inches deeper than bottom of pipe elevation to allow for bedding course. Hand excavate for bell of pipe.
   1. Excavate trenches 12 inches deeper than elevation required in rock or other unyielding bearing material to allow for bedding course.

2. Excavate 16 inches minimum deeper than the elevation required for utilities that are to be placed at or near ground water (within 12 inches of ground water) and backfill with 12” min of drainage rock for pipe stabilization. Place drainage fabric over drainage rock prior to placement of pipe bedding material. Wrap the pipe zone material in drainage fabric if the pipe is below ground water level. Coordinate with City inspector if additional measures are required for utility support.

3.08 SUBGRADE INSPECTION

A. Notify Architect when excavations have reached required subgrade.
B. If Architect determines that unsatisfactory soil is present, continue excavation and replace with compacted backfill or fill material as directed.
C. Proof-roll subgrade below the building slabs and pavements with heavy pneumatic-tired equipment to identify soft pockets and areas of excess yielding. Do not proof-roll wet or saturated subgrades. DO not route construction traffic over subgrade.
   1. Completely proof-roll subgrade in one direction, repeating proof-rolling in direction perpendicular to first direction. Limit vehicle speed to 3 mph.
   2. Proof-roll with a loaded 10-wheel, tandem-axle dump truck weighing not less than 15 tons.
   3. Excavate soft spots, unsatisfactory soils, and areas of excessive pumping or rutting, as determined by Architect, and replace with 2’ of imported structural granular fill to stabilize soft areas or as directed.
D. Authorized additional excavation and replacement material will be paid for according to Contract provisions for changes in the Work. Soft spots caused by routing construction equipment over subgrade will be repaired without additional compensation.
E. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by Architect, without additional compensation.

3.09 UNAUTHORIZED EXCAVATION

A. Fill unauthorized excavation under foundations or wall footings by extending bottom elevation of concrete foundation or footing to excavation bottom, without altering top elevation. Lean concrete fill, with 28-day compressive strength of 2500 psi, may be used when approved by Architect.
   1. Fill unauthorized excavations under other construction or utility pipe as directed by Architect.

3.10 STORAGE OF SOIL MATERIALS

A. Stockpile borrow soil materials and excavated satisfactory soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
   1. Stockpile soil materials away from edge of excavations. Do not store within drip line of remaining trees.

3.11 BACKFILL

A. Place and compact backfill in excavations promptly, but not before completing the following:
   1. Construction below finish grade including, where applicable, subdrainage, dampproofing, waterproofing, and perimeter insulation.
   2. Surveying locations of underground utilities for Record Documents.
   3. Testing and inspecting underground utilities.
   4. Removing concrete formwork.
   5. Removing trash and debris.
   6. Removing temporary shoring and bracing, and sheeting.
   7. Installing permanent or temporary horizontal bracing on horizontally supported walls.

B. Place backfill on subgrades free of mud, frost, snow, or ice.

3.12 UTILITY TRENCH BACKFILL

A. Place backfill on subgrades free of mud, frost, snow, or ice.
B. Place and compact bedding course on trench bottoms and where indicated. Shape bedding course to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits.
C. Trenches under Footings: Backfill trenches excavated under footings and within 18 inches of bottom of footings with bedding course material; fill with concrete to elevation of bottom of footings. Concrete is specified in Division 03 Section "Cast-in-Place Concrete Miscellaneous Cast-in-Place Concrete."
D. Place and compact initial backfill of subbase material, free of particles larger than 1 inch in any dimension, to a height of 12 inches over the pipe or conduit.
    1. Carefully compact initial backfill under pipe haunches and compact evenly up on both sides and along the full length of piping or conduit to avoid damage or displacement of piping or conduit. Coordinate backfilling with utilities testing.
E. Place and compact final backfill of satisfactory soil to final subgrade elevation.
F. Install warning tape directly above utilities, 12 inches below finished grade, except 6 inches below subgrade under pavements and slabs.

3.13 SOIL FILL

A. Plow, scarify, bench, or break up sloped surfaces steeper than 1 vertical to 4 horizontal so fill material will bond with existing material.
B. Place and compact fill material in layers to required elevations as follows:
    1. Under grass and planted areas, native soils may be used as longs as they meet compaction requirements outlined in section 3.15 (top 6" topsoil).
    2. Under walks and pavements and artificial turf areas, use satisfactory soil material (fill as defined in the geotechnical report).
    3. Under steps and ramps, use structural fill.
    4. Under building slabs, use structural fill.
    5. Under footings and foundations, use structural fill.
    6. Under utility lines and utility structures, use bedding course material
    7. Pipe zone (bottom of pipe to 1 foot over the top of pipe), use bedding course material
C. Place soil fill on subgrades free of mud, frost, snow, or ice.

3.14 SOIL MOISTURE CONTROL

A. Uniformly moisten or aerate subgrade and each subsequent fill or backfill soil layer before compaction to within 2 percent of optimum moisture content.
    1. Do not place backfill or fill soil material on surfaces that are muddy, frozen, or contain frost or ice.
    2. Remove and replace, or scarify and air dry otherwise satisfactory soil material that exceeds optimum moisture content by 2 percent and is too wet to compact to specified dry unit weight.

3.15 COMPACTION OF SOIL BACKFILLS AND FILLS

A. Place backfill and fill soil materials in layers not more than 8 inches in loose depth for material compacted by heavy compaction equipment, and not more than 4 inches in loose depth for material compacted by hand-operated tampers.
B. Place backfill and fill soil materials evenly on all sides of structures to required elevations, and uniformly along the full length of each structure.

C. Compact soil materials to not less than the following percentages of maximum dry unit weight according to ASTM D1557:
   1. Under structures, building slabs, steps, and pavements, compact each layer of backfill or fill soil material at 95 percent. If there is greater than 5 feet of fill below structurally loaded areas compact to 98 percent.
   2. Under walkways, scarify and recompact top 6 inches below subgrade and compact each layer of backfill or fill soil material at 95 percent.
   3. Under unpaved areas, scarify and recompact top 6 inches below subgrade and compact each layer of backfill or fill soil material at 92 percent.
   4. Under artificial turf areas, scarify and recompact top 6 inches below subgrade and compact each layer of backfill or fill soil material at 98 percent.
   5. For utility trenches, refer to city standards for utility trenching (96 percent min.). All fill and compaction in utility trenches both onsite and offsite must meet these requirements.

3.16 GRADING

A. General: Uniformly grade areas to a smooth surface, free of irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.
   1. Provide a smooth transition between adjacent existing grades and new grades.
   2. Cut out soft spots, fill low spots, and trim high spots to comply with required surface tolerances.
   3. For the Artificial Turf Fields the grading must be Uniformly Laser graded.

B. Site Grading: Slope grades to direct water away from buildings and to prevent ponding. Finish subgrades to required elevations within the following tolerances:
   1. Lawn or Unpaved Areas: Plus or minus 1 inch.
   2. Walks: Plus or minus 1/2 inch.
   3. Pavements: Plus or minus 1/2 inch.
   4. Artificial Turf: Plus or minus 1/2 inch

C. Grading inside Building Lines: Finish subgrade to a tolerance of 1/2 inch when tested with a 10-foot straightedge.

3.17 SUBBASE AND BASE COURSES

A. Place subbase and base course on subgrades free of mud, frost, snow, or ice.

B. On prepared subgrade, place subbase and base course under pavements and walks as follows:
   1. Place base course material over subbase course under hot-mix asphalt pavement.
   2. Shape subbase and base course to required crown elevations and cross-slope grades.
   3. Place subbase and base course that exceeds 6 inches in compacted thickness in layers of equal thickness, with no compacted layer more than 6 inches thick or less than 3 inches thick.
   4. Compact subbase and base course at optimum moisture content to required grades, lines, cross sections, and thickness to not less than 95 percent of maximum dry unit weight according to ASTM D1557.

3.18 DRAINAGE COURSE

A. Place drainage course on subgrades free of mud, frost, snow, or ice.

B. On prepared subgrade, place and compact drainage course under cast-in-place concrete slabs-on-grade as follows:

1. Place drainage course that exceeds 6 inches in compacted thickness in layers of equal thickness, with no compacted layer more than 6 inches thick or less than 3 inches thick. Compact over drainage piping with 4 passes of smooth drum roller as required by pipe manufacture.
2. Compact drainage course material using 4 passes of a smooth drum 5 ton vibratory roller or equivalent each layer to required thickness.

3.19 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified independent geotechnical engineering testing agency to perform field quality-control testing.

B. Allow testing agency to inspect and test subgrades and each fill or backfill layer. Proceed with subsequent earthwork only after test results for previously completed work comply with requirements.

C. Footing Subgrade: At footing subgrades, at least one test of each soil stratum will be performed to verify design bearing capacities. Subsequent verification and approval of other footing subgrades may be based on a visual comparison of subgrade with tested subgrade when approved by Architect.

D. Testing agency will test compaction of soils in place according to ASTM D 1556, ASTM D 2167, ASTM D 2922, and ASTM D 2937, as applicable. Tests will be performed at the following locations and frequencies:
   1. Paved and Building Slab Areas: At subgrade and at each compacted fill and backfill layer, at least 1 test for every 2000 sq. ft. or less of paved area or building slab, but in no case fewer than 3 tests.
   2. Foundation Wall Backfill: At each compacted backfill layer, at least 1 test at each spot footing and for each 50 feet or less of wall length, but no fewer than 2 tests.
   3. Trench Backfill: At each compacted initial and final backfill layer, at least 1 test for each 150 feet or less of trench length, but no fewer than 2 tests.

E. When testing agency reports that subgrades, fills, or backfills have not achieved degree of compaction specified, scarify and moisten or aerate, or remove and replace soil to depth required; recompact and retest until specified compaction is obtained.

F. Contractor to provide the owner and engineer with a post construction topographic survey of the entire site within the project limit line indicating that the construction complies with the grades shown on sheet grading plans. The elevations shown on the grading plan are at finish surface (final elevation.) The elevations will be surveyed at the top of subgrade layer placed in the field (allowing for the thickness of the artificial turf and crusher course). Refer to the architectural plans for turf thickness requirements. Refer to earthwork specifications for grading tolerances allowed for the final surfaces. This survey is to be provided to the owner/architect for use by the engineer of record to prior of the final grading of the artificial turf. Contractor to regrade areas that do not meet the design grade elevations and slopes shown on the plans.

G. The contractor to schedule the engineer of record in writing 3 days minimum before placement of concrete curbing, flatwork, or asphalt paving. All areas must be formed and have compacted base course in place for the engineer to complete a random spot grade check before asphalt and concrete construction. The random grade checks are for general conformance to slopes and grading shown on plans using a smart level. Random checks do not alleviate the contractor's responsibility to ensure grading is in conformance with plans and specifications and satisfy performance of his work. Within 2 days of the random spot check, results of the spot checks and areas of non compliance will be provided to the contractor and architect.

3.20 PROTECTION

A. Protecting Graded Areas: Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.

B. Repair and reestablish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions.
   1. Scarify or remove and replace soil material to depth as directed by Architect; reshape and recompact.

C. Where settling occurs before Project correction period elapses, remove finished surfacing, backfill with additional soil material, compact, and reconstruct surfacing.
   1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

3.21 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Disposal: Transport surplus satisfactory soil to designated storage areas on Owner's property. Stockpile or spread soil as directed by Architect.
   1. Remove waste material, including unsatisfactory soil, trash, and debris, and legally dispose of it off Owner's property.

END OF SECTION 31 2000

SECTION 32 0001

INFIELD MIX FOR SOFTBALL

PART 1 – GENERAL

1.01 SUMMARY

A. This section includes the material and labor requirements for construction of a complete infield skin surface using the following material:
   1. DuraEdge Classic Infield Mix
B. Related Sections:
   1. Site Preparation
   2. Earthwork

1.02 SUBMITTALS

A. Product Data: For the product specified, submit a 5-pound sample along with a private lab test result indicating the particle size analysis of the material specified. All tests shall be performed in accordance with ASTM F1632.
B. Approved Testing Lab:

Turf & Soil Diagnostics
35 King Street
Trumansburg, NY 14886
(607) 387-5694

1.03 PROJECT/SITE CONDITIONS

A. All site work and earthwork shall be performed in accordance with the preceding sections. Sub-base material shall compact to 90 percent. If conditions do not warrant such compaction then an imported select granular fill shall be installed. Furthermore, the compacted sub-grade shall be installed in accordance with the final slope and shall mirror finish grade in order to ensure an even depth of material once placement has occurred.
B. Under no circumstances are perforated pipe under drains necessary or recommended for
   1. use under any infield skin material. Geotextile fabric is not recommended between the compacted sub-base and the infield skin material.
C. In certain instances, and where warranted, a survey of the sub-grade elevations shall occur prior to placement of the infield skin material.

1.04 QUALITY ASSURANCE

A. Installer Qualifications: Installers of materials specified shall have, at minimum, five successful installations of similar projects and materials. Installers shall be in possession of and demonstrate knowledge of the use of laser guided finishing equipment.
B. Material: If quality control samples are specified, they shall be completed at a rate of one per 250 tons of material delivered to the jobsite. All tests shall be conducted by the lab specified in Section 1.2 (B). All testing will be compared to and be in accordance with the material specifications provided in Section 2.2.

PART 2 – MATERIALS

2.01 MANUFACTURER

A. DuraEdge Classic Infield Mix is produced in various locations throughout the United States of America by and at the direction of the following manufacturer:

1. DuraEdge Products, Inc.
   149 South Broad Street, Grove City, PA 16127 Phone: (866) 867-0052
   Fax: (724) 264-4174
   Email: info@duraedge.com Website: www.duraedge.com

2.02 MATERIALS

A. DuraEdge Classic Infield Mix is an engineered soil product which is mechanically mixed offsite in a controlled environment using a pugmill-type mixer. This process ensures thorough mixing of the sand and clay components to exact specifications.

B. Performance Specification
   1. Infield mix shall be clean, dry clay mixed with washed mason-type sand resulting in a weed-free mixture that is reddish brown in color having a yield of 1.35 tons per cubic yard when placed loose or 1.5 tons per cubic yard when compacted 85% - 90% on a Standard Proctor Test (((ASTM D698))-21). The material possesses the following particle size analysis:
      a. Total sand content shall be 70-75 percent.
      b. The combined amount of sand retained on the medium, coarse and very coarse sieves shall be greater than or equal to 50 percent.
      c. The combined amount of silt and clay shall be 25-30 percent.
      d. The ratio of silt divided by clay, otherwise known as the SCR, shall be 0.5 –
         1) 1.0.
      e. No particles greater than 3 millimeters.
      f. Equal to or less than 5 percent of particles shall be retained on the 0.08 inch.
      g. A minimum of 80% of the total silt content shall fall in the fine region (between 20 and 2 microns).
         1) Test ASTM D422 will be used to assure that the course silt is not greater than 20% of the total silt present in the infield mix.
         2) This testing will be submitted to and conducted by the same facility listed in Section 1.2-B.

C. Basis of Design Product
   1. Materials meeting this specification would be DuraEdge Classic Infield Mix as manufactured by DuraEdge Products, Inc., Grove City, PA, (866) 867-0052, or an approved equal.

D. Amendments
   1. Certain amendments are approved for use with DuraEdge Classic Infield Mix and shall be installed in accordance with the manufacturer’s recommendations. Contact the manufacturer for further instructions.

2.03 EXCESS MATERIALS

A. Provide the owners’ authorized representative with a 10-ton stockpile of material for future use.

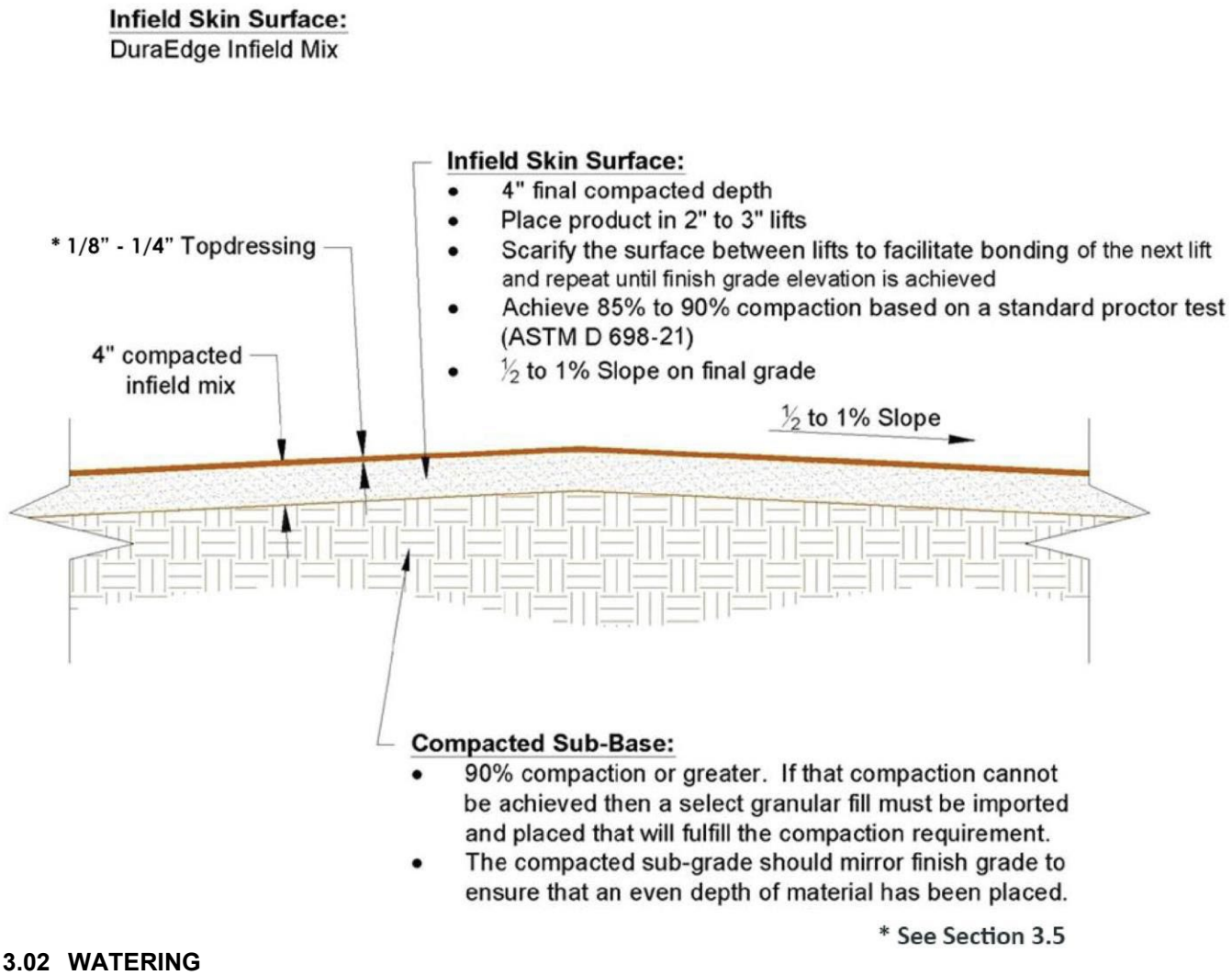
PART 3 – EXECUTION

3.01 PLACEMENT

A. Place the material in lifts of 2 to 3 inches and lightly compact until an optimum compaction between 85 and 90 percent is achieved on a standard proctor test (((ASTM D698))-21). To facilitate bonding between lifts, scarify the surface, apply a light application of water, and repeat until finish grade elevation is achieved. Completing this process as described will minimize settling and improve the performance of the product. See diagram in 3.1.C.

B. Depth of the material shall be 4 inches for new construction when finished and compacted. See diagram in 3.1.C.

C. Typical cross-section of infield skin:



3.02 WATERING

A. If material does not have optimum moisture, then achieving 85-90% compaction is not possible. If the material is dry, then the appropriate amount of water will have to be added to provide sufficient moisture throughout, for proper compaction. This may require a day or two for moisture to wick properly, prior to finish grading.

3.03 FINISH GRADING

A. For best results the material shall be finish graded with a laser device that allows accuracy to +/- 1/8 inch. A slope of 1/2 percent to 1 percent shall be placed on the infield surface in order to facilitate surface drainage.

3.04 INSPECTION

A. The finished surface of the infield shall be smooth and free from any visible dips, humps, bumps or other blemishes which would hinder the removal of water through positive surface drainage. Where warranted, a finished elevation survey shall be conducted to assure proper installation.

3.05 TOPDRESSING

A. Following successful inspection, topdressing shall be applied to the surface for optimum product performance. This topdressing is either expanded shale or calcined clay product and shall be added at a rate of 0.5-1 lb per square foot.
   1. If play will not be taking place on the infield for several weeks, wait until the season is going to start to apply topdressing (this is practically important in the Fall or the end of the season when putting the infield “to bed” for the winter/season). If play is taking place within a few weeks, add topdressing and drag.

B. Product is either ProSlide Expanded Shale or FairBall/PlayBall/Platinum Calcined Clay Topdressing. A combination of Expanded Shale and a previous listed Calcined Clay may be used for the topdressing process. All are available through DuraEdge Products, Inc., Grove City, PA, (866) 867-0052.

END OF SECTION 32 0001

This page intentionally left blank

SECTION 32 0002

BATTERS BOX MIX FOR SOFTBALL

PART 1 – GENERAL

1.01 SUMMARY

A. This section includes the material and labor requirements for construction of a complete pitching s mound and batter's box surface for the following material:
   1. DuraPitch Premium Mound Clay
B. Related Sections
   1. Site Preparation
   2. Earthwork

1.02 SUBMITTALS

A. Product Data: For the product specified, submit a 5-pound sample along with a private lab test result indicating the particle size analysis of the material specified. All tests shall be performed in accordance with ASTM F1632.
B. Approved Testing Lab:
   Turf & Soil Diagnostics
   35 King Street
   Trumansburg, NY 14886
   (607) 387-5694

1.03 PROJECT/SITE CONDITIONS

A. All site work and earthwork shall be performed in accordance with the preceding sections. Furthermore, the compacted subgrade shall be installed in accordance with the final slope and shall mirror finish grade in order to ensure an even depth of material once placement has occurred.
B. In certain instances, and where warranted, a survey of the subgrade elevations shall occur prior to placement of the material.

1.04 QUALITY ASSURANCE

A. Installer Qualifications: Installers of materials specified shall have, at minimum, five successful installations of similar projects and materials. Installers shall be in possession of and demonstrate knowledge of the use of appropriate tools and equipment for the proper compaction and finishing of a pitcher's mound and batter's box area.
B. Material: If quality control samples are specified, they shall be completed at a rate of one per 250 tons of material delivered to the jobsite. All tests shall be conducted by the lab specified in Section 1.2 (B). All testing will be compared to and be in accordance with the material specifications provided in Section 2.2.

PART 2 – MATERIALS

2.01 MANUFACTURER

A. DuraPitch Premium Mound Clay is produced by the following manufacturer:
   DuraEdge Products, Inc.
   149 South Broad Street, Grove City, PA 16127
   Phone: (866) 867-0052 Fax: (724) 530-6696
   Email: info@duraedge.com Website: www.duraedge.com

2.02 MATERIALS

A. DuraPitch Premium Mound Clay is an engineered soil product which is mechanically mixed offsite in a controlled environment using a pugmill-type mixer. This process ensures thorough mixing of the sand and clay components to exact specifications.

B. Product Specification:
   1. Pitching mound and batter's box clay is clean, dry clay mixed with washed mason- type sand resulting in a weed-free mix that is reddish brown in color having a yield of 1.75 tons per cubic yard and possessing the following particle size analysis:
      a. Total sand content shall be 15-28 percent.
      b. The overall clay content shall be greater than 30 percent.
      c. The ratio of silt divided by clay, otherwise known as the SCR, shall be 0.75 – 1.25.

C. Basis of Design Product:
   Material meeting this specification is DuraPitch Premium Mound Clay as manufactured by DuraEdge Products, Inc., Grove City, PA., (866) 867-0052, or an approved equal.

2.03 EXCESS MATERIALS

A. Provide the owners' authorized representative with a 1-ton pallet of material for future use.

PART 3 – EXECUTION

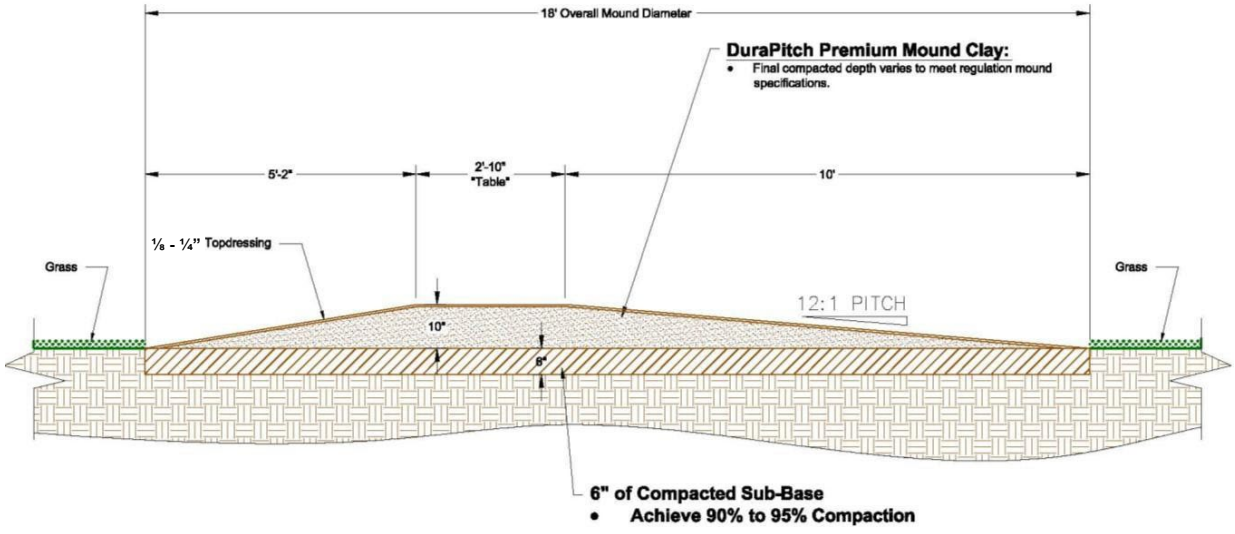
3.01 PLACEMENT

A. Place the material in lifts of 2 inches and compact with 1-ton vibratory roller until an optimum compaction between 90 percent and 95 percent is achieved. Scarify the surface to facilitate bonding of the next lift and repeat until finish grade elevation is achieved. Completing this process as described will minimize settling and improve the performance of the product. See diagram in 3.1.C.

B. Depth of the material shall vary when finished and compacted. Please see diagram in 3.1.C.

C. Typical cross-section of pitching mound:

Typical Professional Pitching Mound Cross-Section
(looking at the side of the mound)



3.02 WATERING

A. In most cases, the material is delivered with optimum moisture and adding water is not necessary. If unable to achieve optimum compaction, a light application of water may be needed.

3.03 INSPECTION

A. The finished surface of the infield shall be smooth and free from any visible dips, humps, bumps or other blemishes which would hinder the removal of water through positive surface drainage. In some instances, and where warranted, a finished elevation survey shall be conducted to assure proper installation.

3.04 TOPDRESSING & CONDITIONER

A. Following successful inspection, topdressing shall be applied to the surface for optimum product performance. This topdressing is either expanded shale or calcined clay product and shall be added at a rate of 0.5 pounds per 1 sq foot for maintenance, or 1 pound per 1 square foot for new construction.
B. Product is either ProSlide Expanded Shale Topdressing, a ProSlide Calcined Clay Conditioner, or a combination of both. Both are available through DuraEdge Products, Inc., Grove City, PA, (866) 867-0052.

END OF SECTION 32 0002

SECTION 32 0003

WARNING TRACK FOR SOFTBALL

PART 1 – GENERAL

1.01 SUMMARY

A. This section includes the material and labor requirements for construction of a complete warning track for the following items:
   1. DuraTrax Warning Track
B. Related Sections
   1. Site Preparation
   2. Earthwork

1.02 SUBMITTALS

A. Product Data: For the product specified, submit a 5-pound sample along with a private lab test result indicating the particle size analysis of the material specified. All tests shall be performed in accordance with ASTM F1632.
B. Approved Testing Lab:
   Turf & Soil Diagnostics
   35 King Street
   Trumansburg, NY 14886
   607-387-5694

1.03 PROJECT/SITE CONDITIONS

A. All site work and earthwork shall be performed in accordance with the preceding sections. Furthermore, the compacted subgrade shall be installed in accordance with the final slope and shall mirror finish grade in order to ensure an even depth of material once placement has occurred.
B. In certain instances, and where warranted, a survey of the subgrade elevations shall occur prior to placement of the material.

1.04 QUALITY ASSURANCE

A. Installer Qualifications: Installers of materials specified shall have, at minimum, five successful installations of similar projects and materials. Installers shall be in possession of and demonstrate knowledge of the use of laser guided finishing equipment.
B. Material: If quality control samples are specified, they shall be completed at a rate of one per 250 tons of material delivered to the jobsite. All tests shall be conducted by the lab specified in Section 1.2 (B). All testing will be compared to and be in accordance with the material specifications provided in Section 2.2.

PART 2 – PRODUCT

2.01 MANUFACTURERS

A. DuraTrax Warning Track is by the following manufacturer:
   DuraEdge Products, Inc.
   149 South Broad Street, Grove City, PA 16127
   Phone: (866) 867-0052 Fax: (724) 530-6696
   Email: info@duraedge.com Website: www.duraedge.com

2.02 MATERIALS

WARNING TRACK AGGREGATE GRADATION

A. DuraTrax Lava Warning Track is an engineered product which is mechanically crushed and screened offsite in a controlled environment.

B. Performance Specification

1. Warning Track shall be clean, crushed reddish brown lava resulting in a mix that is reddish brown in color, having a yield of 1.15 tons per cubic yard and possessing the following particle size analysis:

Sieve Designation	Range of % Passing
3/16”	100
No. 4	90-100
No. 8	60-80
No. 16	45-60
No. 30	30-50
No. 50	20-35
No. 100	10-25
No. 200	5-15

C. Basis of Design Product:

1. Material meeting this specification would be DuraTrax Lava Warning Track as manufactured by DuraEdge Products, Inc. 866-867-0052, or an approved equal.

2.03 EXCESS MATERIALS

A. Provide the owners’ authorized representative with a 1-ton pallet of material for future use.

PART 3 – EXECUTION

3.01 PLACEMENT

A. First, excavate material from the warning track area to a depth of 7 inches below the final finished grade.

B. Compact the subgrade until 90 to 95 percent compaction is achieved

C. Place 3 inches of 2A limestone on top of the subgrade, capped with 1 inch of limestone dust, for a total of 4 inches.

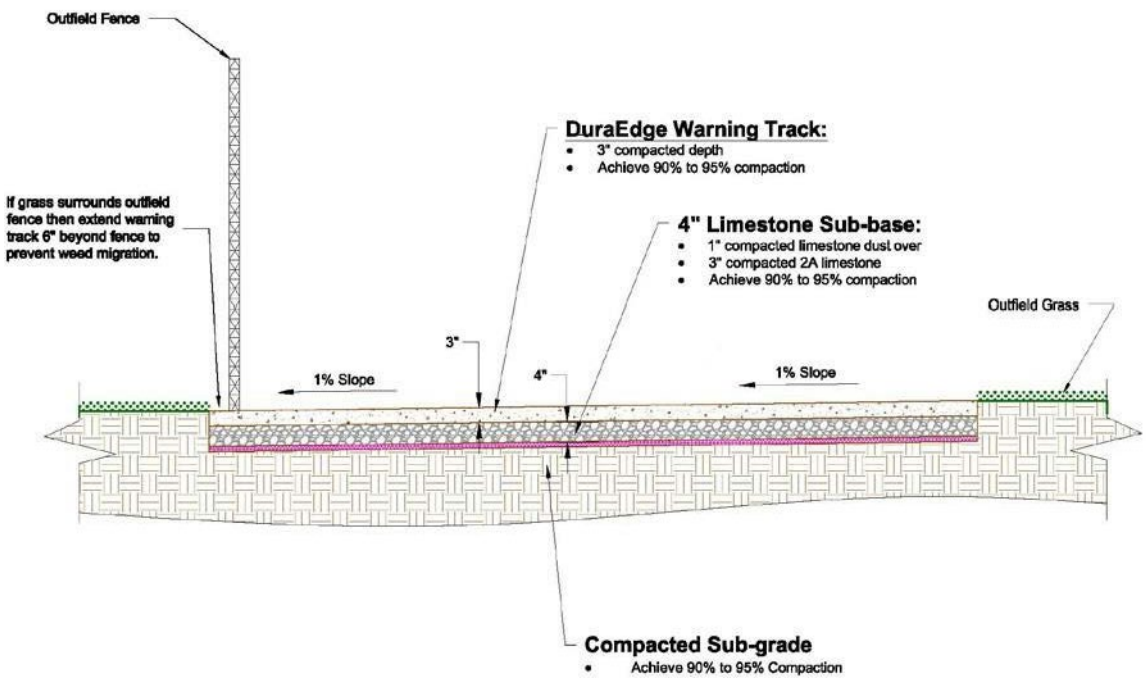
D. Finally, place the warning track material over the top of the limestone dust. The depth of the warning track material should be 3 inches at completion after compaction.

E. When placing both the limestone and the warning track material, use lifts of 2 inches and compact with a minimum 1-ton vibratory roller until an optimum compaction between 90 percent and 95 percent is achieved. Scarify the surface to facilitate bonding of the next lift and repeat until finish grade elevation is achieved. Completing this process as described will minimize settling and improve the performance of the product.

F. The warning track and limestone layers beneath it must have a 1 percent slope toward the outfield fence. See schematic cross-section below in 3.1.H.

G. Warning Track Cross-Section:

Warning Track Cross-Section



3.02 INSPECTION

A. The finished surface of the warning track shall be smooth and free from any visible dips, humps, bumps or other blemishes which would hinder the removal of water through positive surface drainage. Where warranted, a finished elevation survey shall be conducted to assure proper installation.

END OF SECTION 32 0003

This page intentionally left blank

SECTION 32 1216

HOT-MIX ASPHALT PAVING

PART 1 GENERAL

1.01 REFERENCE STANDARDS

A. AI MS-2 - Asphalt Mix Design Methods; 2015.
B. ASTM D1073 - Standard Specification for Fine Aggregate for Asphalt Paving Mixtures; 2016 (Reapproved 2022).
C. ASTM D1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft3 (2,700 kN-m/m3)); 2012 (Reapproved 2021).

1.02 SUMMARY

A. This Section includes the following:
   1. Asphalt paving.
   2. Pavement-marking.
B. Related Sections include the following:
   1. Division 2 Section "Earthwork" for aggregate subbase and base courses and for aggregate pavement shoulders.

1.03 DEFINITIONS

A. Hot-Mix Asphalt Paving Terminology: Refer to ASTM D 8 for definitions of terms.
B. DOT: Department of Transportation.

1.04 SYSTEM DESCRIPTION

A. Provide hot-mix asphalt paving according to materials, workmanship, and other applicable requirements of standard specifications of state or local DOT.
   1. Standard Specification: Comply with APWA specifications, Latest edition, and with local governing regulations of more stringent than herein specified.
   2. Measurement and payment provisions and safety program submittals included in standard specifications do not apply to this Section.

1.05 SUBMITTALS

A. Product Data: For each type of product indicated. Include technical data and tested physical and performance properties.
B. Job-Mix Designs: Certification, by authorities having jurisdiction, of approval of each job mix proposed for the Work.
C. Qualification Data: For manufacturer.
D. Material Test Reports: For each paving material.
E. Material Certificates: For each paving material, signed by manufacturers.

1.06 QUALITY ASSURANCE

A. Manufacturer Qualifications: A qualified manufacturer.
   1. Manufacturer shall be a paving-mix manufacturer registered with and approved by authorities having jurisdiction or the DOT of the state of Utah.
B. Testing Agency Qualifications: Qualified according to ASTM D 3666 for testing indicated, as documented according to ASTM E 548.
C. The OWNER will engage materials testing service for quality control during base and asphalt placement operations.

D. Contractor Responsibility for Testing: Advise testing agency sufficiently in advance of operations to allow for completion of quality tests, and for assignment of personnel.
   1. Deliver samplers of proposed base materials to testing agency for analysis and approval.
   2. Assist testing agency representative to safely have access to the site during placement operations
E. Frequency of Tests: Owner's testing agency will be instructed to conduct field density tests of materials as follows:
   a. Aggregate Base Course: Conduct one test for each 1000 sq feet of each lift of material completed to 95% minimum of maximum dry density determined b ASTM D1557-78.
   b. Asphaltic Surface Course: Conduct one test for each 1000 sq feet of material compacted to 96% minimum of design density as determined by ASTM D 1559-78 (Marshall Method).
F. Grade Control: Establish and maintain required lines and elevations.. Lay base course within plus or minus 1/4 inch in 10 feet of required elevations.
G. Asphalt-Paving Publication: Comply with AI MS-22, "Construction of Hot Mix Asphalt Pavements," unless more stringent requirements are indicated.
H. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Management and Coordination."

1.07 PROJECT CONDITIONS

A. Environmental Limitations: Do not apply asphalt materials if subgrade is wet or excessively damp or if the following conditions are not met:
   1. Tack Coats: Minimum surface temperature of 60 deg F.
   2. Asphalt Base Course: Minimum surface temperature of 40 deg F and rising at time of placement.
   3. Asphalt Surface Course: Minimum surface temperature of 60 deg F at time of placement.

PART 2 PRODUCTS

2.01 AGGREGATES

A. General: Use materials and gradations that have performed satisfactorily in previous installations.
B. Coarse Aggregate: ASTM D 692, sound; angular crushed stone, crushed gravel, or properly cured, crushed blast-furnace slag.
C. Fine Aggregate: ASTM D1073, sharp-edged natural sand or sand prepared from stone, gravel, properly cured blast-furnace slag, or combinations thereof.
   1. For hot-mix asphalt, limit natural sand to a maximum of 20 percent by weight of the total aggregate mass.
D. Mineral Filler: ASTM D 242, rock or slag dust, hydraulic cement, or other inert material.

2.02 ASPHALT MATERIALS

A. Asphalt Cement: ASTM D 3381 for viscosity-graded material, use AC-10. ASTM D 6373 for penetration-graded material, use PG 58-22 or PG58-28 per current APWA Specifications.
B. Tack Coat: ASTM D 977, emulsified asphalt or ASTM D 2397, cationic emulsified asphalt, slow setting, diluted in water, of suitable grade and consistency for application.
C. Water: Potable.
D. Undersealing Asphalt: ASTM D 3141, pumping consistency.

2.03 AUXILIARY MATERIALS

A. Herbicide: Commercial chemical for weed control, registered by the EPA. Provide in granular, liquid, or wettable powder form.

2.04 MIXES

A. Hot-Mix Asphalt: Dense, hot-laid, hot-mix asphalt plant mixes approved by authorities having jurisdiction; designed according to procedures in AI MS-2, "Mix Design Methods for Asphalt Concrete and Other Hot-Mix Types"; and complying with the following requirements:
   1. Provide mixes to comply with the APWA Stds.
   2. 1/2-inch aggregate for parking areas, playgrounds and access roadways.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that subgrade is dry and in suitable condition to support paving and imposed loads.
B. Proof-roll subbase using heavy, pneumatic-tired rollers to locate areas that are unstable or that require further compaction.
C. Proceed with paving only after unsatisfactory conditions have been corrected.

3.02 REPAIRS

A. Leveling Course: Install and compact leveling course consisting of hot-mix asphalt surface course to level sags and fill depressions deeper than 1 inch in existing pavements.
   1. Install leveling wedges in compacted lifts not exceeding 3 inches thick.
B. Crack and Joint Filling: Remove existing joint filler material from cracks or joints to a depth of 1/4 inch.
   1. Clean cracks and joints in existing hot-mix asphalt pavement.
   2. Use emulsified-asphalt slurry to seal cracks and joints less than 1/4 inch wide. Fill flush with surface of existing pavement and remove excess.

3.03 SURFACE PREPARATION

A. General: Immediately before placing asphalt materials, remove loose and deleterious material from substrate surfaces. Ensure that prepared subgrade is ready to receive paving.
   1. Sweep loose granular particles from surface of unbound-aggregate base course. Do not dislodge or disturb aggregate embedded in compacted surface of base course.
B. Herbicide Treatment: Apply herbicide according to manufacturer's recommended rates and written application instructions. Apply to dry, prepared subgrade or surface of compacted-aggregate base before applying paving materials.
   1. Mix herbicide formulated by manufacturer for that purpose.
C. Tack Coat: Apply uniformly to surfaces of existing pavement at a rate of 0.05 to 0.15 gal./sq. yd.
   1. Allow tack coat to cure undisturbed before applying hot-mix asphalt paving.
   2. Avoid smearing or staining adjoining surfaces, appurtenances, and surroundings. Remove spillages and clean affected surfaces.

3.04 HOT-MIX ASPHALT PLACING

A. Machine place hot-mix asphalt on prepared surface, spread uniformly, and strike off. Place asphalt mix by hand to areas inaccessible to equipment in a manner that prevents segregation of mix. Place each course to required grade, cross section, and thickness when compacted.
   1. Place hot-mix asphalt base course in number of lifts and thicknesses indicated.

2. Place hot-mix asphalt surface course in single lift.
3. Spread mix at minimum temperature of 250 deg F.
4. Begin applying mix along centerline of crown for crowned sections and on high side of one-way slopes, unless otherwise indicated.
5. Regulate paver machine speed to obtain smooth, continuous surface free of pulls and tears in asphalt-paving mat.

B. Place paving in consecutive strips not less than 10 feet wide unless infill edge strips of a lesser width are required.
   1. After first strip has been placed and rolled, place succeeding strips and extend rolling to overlap previous strips. Complete a section of asphalt base course before placing asphalt surface course.

C. Promptly correct surface irregularities in paving course behind paver. Use suitable hand tools to remove excess material forming high spots. Fill depressions with hot-mix asphalt to prevent segregation of mix; use suitable hand tools to smooth surface.

3.05 JOINTS

A. Construct joints to ensure a continuous bond between adjoining paving sections. Construct joints free of depressions with same texture and smoothness as other sections of hot-mix asphalt course.
   1. Clean contact surfaces and apply tack coat to joints.
   2. Offset longitudinal joints, in successive courses, a minimum of 6 inches.
   3. Offset transverse joints, in successive courses, a minimum of 24 inches.
   4. Construct transverse joints as described in AI MS-22, "Construction of Hot Mix Asphalt Pavements."
   5. Compact joints as soon as hot-mix asphalt will bear roller weight without excessive displacement.
   6. Compact asphalt at joints to a density within 2 percent of specified course density.

3.06 COMPACTION

A. General: Begin compaction as soon as placed hot-mix paving will bear roller weight without excessive displacement. Compact hot-mix paving with hot, hand tampers or vibratory-plate compactors in areas inaccessible to rollers.
   1. Complete compaction before mix temperature cools to 185 deg F.

B. Breakdown Rolling: Complete breakdown or initial rolling immediately after rolling joints and outside edge. Examine surface immediately after breakdown rolling for indicated crown, grade, and smoothness. Correct laydown and rolling operations to comply with requirements.

C. Intermediate Rolling: Begin intermediate rolling immediately after breakdown rolling while hot-mix asphalt is still hot enough to achieve specified density. Continue rolling until hot-mix asphalt course has been uniformly compacted to the following density:
   1. Average Density: 96 percent of reference laboratory density according to AASHTO T 245, but not less than 94 percent nor greater than 100 percent.

D. Finish Rolling: Finish roll paved surfaces to remove roller marks while hot-mix asphalt is still warm.

E. Edge Shaping: While surface is being compacted and finished, trim edges of pavement to proper alignment. Bevel edges while asphalt is still hot; compact thoroughly.

F. Repairs: Remove paved areas that are defective or contaminated with foreign materials and replace with fresh, hot-mix asphalt. Compact by rolling to specified density and surface smoothness.

G. Protection: After final rolling, do not permit vehicular traffic on pavement until it has cooled and hardened.

3.07 INSTALLATION TOLERANCES

A. Thickness: Compact each course to produce the thickness indicated within the following tolerances:
   1. Base Course: Plus or minus 1/2 inch.
   2. Surface Course: Plus 1/4 inch, no minus.

B. Surface Smoothness: Compact each course to produce a surface smoothness within the following tolerances as determined by using a 10-foot straightedge applied transversely or longitudinally to paved areas:
   1. Base Course: 1/4 inch.
   2. Surface Course: 1/8 inch.
   3. Crowned Surfaces: Test with crowned template centered and at right angle to crown. Maximum allowable variance from template is 1/4 inch.

3.08 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified independent testing and inspecting agency to perform field tests and inspections and to prepare test reports.
   1. Testing agency will conduct and interpret tests and state in each report whether tested Work complies with or deviates from specified requirements.

B. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

C. Thickness: In-place compacted thickness of hot-mix asphalt courses will be determined according to ASTM D 3549.

D. Surface Smoothness: Finished surface of each hot-mix asphalt course will be tested for compliance with smoothness tolerances.

E. In-Place Density: Testing agency will take samples of uncompacted paving mixtures and compacted pavement according to ASTM D 979.
   1. Reference maximum theoretical density will be determined by averaging results from four samples of hot-mix asphalt-paving mixture delivered daily to site, prepared according to ASTM D 2041, and compacted according to job-mix specifications.
   2. In-place density of compacted pavement will be determined by testing core samples according to ASTM D 1188 or ASTM D 2726.
      a. One core sample will be taken for every 1000 sq. yd. or less of installed pavement, with no fewer than 3 cores taken.

F. Remove and replace or install additional hot-mix asphalt where test results or measurements indicate that it does not comply with specified requirements.

3.09 DISPOSAL

A. Except for material indicated to be recycled, remove excavated materials from Project site and legally dispose of them in an EPA-approved landfill.
   1. Do not allow excavated materials to accumulate on-site.

END OF SECTION 32 1216

This page intentionally left blank

SECTION 32 1313

SITE CONCRETE

PART 1 - GENERAL

1.01 REFERENCE STANDARDS

A. AASHTO M 182 - Standard Specification for Burlap Cloth Made from Jute or Kenaf and Cotton Mats; 2005.
B. ASTM C171 - Standard Specification for Sheet Materials for Curing Concrete; 2020.
C. ASTM D1751 - Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types); 2018.

1.02 1.1 SUMMARY

A. This Section includes exterior cement concrete pavement for the following:
    1. Driveways and concrete pads
    2. Curbs and gutters
    3. Walkways
        a. 1.2 SUBMITTALS
B. Product Data: For each type of product indicated.
C. Design Mixtures: For each concrete pavement mixture.
        a. 1.3 QUALITY ASSURANCE
D. Manufacturer Qualifications: Manufacturer of ready-mixed concrete products who complies with ASTM C 94 requirements for production facilities and equipment.
E. ACI Publications: Comply with ACI 301, “Specification for Structural Concrete,” unless modified by requirements in the Contract Documents.

PART 2 - PRODUCTS

2.01 2.1 CONCRETE MATERIALS

A. Cementitious Material: Use the following cementitious materials, of the same type, brand, and source throughout the Project:
    1. Portland Cement: ASTM C 150, Type II, gray.
B. Normal-Weight Aggregates: ASTM C 33, Class 4S coarse aggregate, uniformly graded. Provide aggregates from a single source.
C. Water: ASTM C 94.
D. Air-Entraining Admixture: ASTM C 260.
E. Chemical Admixtures: ASTM C 494, of type suitable for application, certified by manufacturer to be compatible with other admixtures and to contain no more than 0.1 percent water-soluble chloride ions by mass of cementitious material.
        a. 2.2 CURING MATERIALS
F. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth.
G. Moisture-Retaining Cover: ASTM C171, polyethylene film or white burlap-polyethylene sheet.
H. Water: Potable.
I. Evaporation Retarder: Waterborne, monomolecular film forming; manufactured for application to fresh concrete.
        a. 2.3 RELATED MATERIALS
J. Expansion- and Isolation-Joint-Filler Strips: ASTM D1751, asphalt-saturated cellulosic fiber.
        a. 2.4 STEEL REINFORCEMENT

K. Epoxy-Coated Reinforcing Bars: ASTM A 615, Grade 60, deformed bars, ASTM A 775, epoxy coated, with less than 2 percent damaged coating in each 12-inch bar length.
L. Bar Supports: bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars or dowels in place. Manufacture bar supports according to CRSI's "Manual of Standard Practice".
    a. 2.5 CONCRETE MIXTURES
M. Prepare design mixtures, proportioned according to ACI 301, with the following properties:
    1. Compressive Strength (28 Days): 4000 psi.
    2. Maximum Water-Cementitious Materials Ratio at Point of Placement: 0.45.
    3. Slump Limit: 4 inches, plus or minus 1 inch.
    4. Air Content: 6-1/2 percent plus or minus 1.5 percent.
    5. Cement: 6-1/2 bag mix.
        a. 2.6 CONCRETE MIXING
N. Ready-Mixed Concrete: Measure, batch, and mix concrete materials and concrete according to ASTM C 94. Furnish batch certificates for each batch discharged and used in the Work.

PART 3 - EXECUTION

3.01 3.1 EXAMINATION

A. Proof-roll prepared subbase surface below concrete pavements with heavy pneumatic-tired equipment to identify soft pockets and areas of excess yielding.
    a. 3.2 EDGE FORMS AND SCREED CONSTRUCTION
B. Set, brace, and secure edge forms, bulkheads, and intermediate screed guides for pavement to require lines, grades, and elevations. Install forms to allow continuous progress of work and so forms can remain in place at least 24 hours after concrete placement.
C. Clean forms after each use and coat with form-release agent to ensure separation from concrete without damage.
    a. 3.3 STEEL REINFORCEMENT
D. General: Comply with CRSI’s “Manual of Standard Practice” for fabricating, placing, and supporting reinforcement embedded in concrete flatwork.
    a. 3.4 JOINTS
E. General: Form construction, isolation, and contraction joints and tool edging true to line with faces perpendicular to surface plane of concrete. Construct transverse joints at right angles to centerline, unless otherwise indicated.
F. Construction Joints: Set construction joints at side and end terminations of pavement and at locations where pavement operations are stopped for more than one-half hour unless pavement terminates at isolation joints.
G. Isolation Joints: Form isolation joints of preformed joint-filler strips abutting concrete curbs, catch basins, manholes, inlets, structures, walks, other fixed objects, and where indicated.
H. Contraction Joints: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of the concrete thickness to match jointing of existing adjacent concrete pavement.
I. Edging: Tool edges of pavement, gutters, curbs, and joints in concrete after initial floating with an edging tool to a 1/4-inch radius. Repeat tooling of edges after applying surface finishes. Eliminate tool marks on concrete surfaces.
    a. 3.5 CONCRETE PLACEMENT
J. Moisten subbase to provide a uniform dampened condition at time concrete is placed.
K. Comply with ACI 301 requirements for measuring, mixing, transporting, and placing concrete.
L. Deposit and spread concrete in a continuous operation between transverse joints. Do not push or drag concrete into place or use vibrators to move concrete into place.
M. Screed pavement surfaces with a straightedge and strike off.

N. Commence initial floating using bull floats or darbies to impart an open textured and uniform surface plane before excess moisture or bleed water appears on the surface. Do not further disturb concrete surfaces before beginning finishing operations or spreading surface treatments.
    a. 3.6 FLOAT FINISHING
O. General: Do not add water to concrete surfaces during finishing operations.
P. Float Finish: Begin the second floating operation when bleed-water sheen has disappeared and concrete surface has stiffened sufficiently to permit operations. Float surface with power-driven floats, or by hand floating if area is small or inaccessible to power units. Finish surfaces to true planes. Cut down high spots and fill low spots. Refloat surface immediately to uniform granular texture.
    1. Medium-to-Fine-Textured Broom Finish: Draw a soft bristle broom across float-finished concrete surface perpendicular to line of traffic to provide a uniform, fine-line texture.
        a. 3.7 CONCRETE PROTECTION AND CURING
Q. A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.
R. Comply with ACI 306.1 for cold-weather protection.
S. Evaporation Retarder: Apply evaporation retarder to concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. Ft. x h before and during finishing operations. Apply according to manufacturer’s written instructions after placing, screening, and bull floating or darbying concrete, but before float finishing.
T. Begin curing after finishing concrete but not before free water has disappeared from concrete surface.
U. Curing Methods: Cure concrete by moisture curing, moisture-retaining-cover curing, curing compound, or a combination of these methods.
        a. 3.8 PAVEMENT TOLERANCES
V. Comply with tolerances of ACI 117 and as follows:
    1. Elevation: 1/4 inch.
    2. Thickness: Plus 3/8-inch, minus 1/4 inch.
    3. Surface: Gap below 10-foot-long, unleveled straightedge not to exceed 1/4 inch.
    4. Joint Spacing: 3 inches.
    5. Contraction Joint Depth: Plus 1/4 inch, no minus.
    6. Joint Width: Plus 1/8 inch, no minus.
        a. 3.9 REPAIRS AND PROTECTION
W. A. Remove and replace concrete pavement that is broken, damaged, or defective or that does not comply with requirements in this Section.
X. Protect concrete from damage. Exclude traffic from pavement for at least 14 days after placement.
Y. Maintain concrete pavement free of stains, discoloration, dirt, and other foreign material. Sweep concrete pavement not more than two days before date scheduled for Substantial Completion inspections.

END OF SECTION 32 1313

This page intentionally left blank

SECTION 32 1373

CONCRETE PAVING JOINT SEALANTS

PART 1 GENERAL

1.01 REFERENCE STANDARDS

A. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2018.
B. ASTM C1021 - Standard Practice for Laboratories Engaged in Testing of Building Sealants; 2008 (Reapproved 2023).
C. ASTM C1087 - Standard Test Method for Determining Compatibility of Liquid-Applied Sealants with Accessories Used in Structural Glazing Systems; 2016.
D. ASTM C1193 - Standard Guide for Use of Joint Sealants; 2016.
E. ASTM D6690 - Standard Specification for Joint and Crack Sealants, Hot Applied, for Concrete and Asphalt Pavements; 2015.

1.02 SUMMARY

A. Section Includes:
   1. Cold-applied joint sealants.
   2. Hot-applied joint sealants.

1.03 PRECONSTRUCTION TESTING

A. Preconstruction Compatibility and Adhesion Testing: Submit to joint-sealant manufacturers, eight, Samples of materials that will contact or affect joint sealants. Use ASTM C1087 to determine whether priming and other specific joint-preparation techniques are required to obtain rapid, optimum adhesion of joint sealants to joint substrates.

1.04 SUBMITTALS

A. Product Data: For each joint-sealant product indicated.
B. Samples: For each kind and color of joint sealant required.
C. Pavement-Joint-Sealant Schedule: Include the following information:
   1. Joint-sealant application, joint location, and designation.
   2. Joint-sealant manufacturer and product name.
   3. Joint-sealant formulation.
   4. Joint-sealant color.
D. Product certificates.
E. Product test reports.
F. Preconstruction compatibility and adhesion test reports.

1.05 QUALITY ASSURANCE

A. Testing Agency Qualifications: An independent testing agency qualified according to ASTM C1021.
B. Preinstallation Conference: Conduct conference at Project site.

PART 2 PRODUCTS

2.01 MATERIALS

A. Compatibility: Provide joint sealants, backing materials, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint-sealant manufacturer based on testing and field experience.
B. Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range.

2.02 COLD-APPLIED JOINT SEALANTS

A. Single-Component, Nonsag, Silicone Joint Sealant for Concrete: ASTM D 5893, Type NS.
    1. Products: Subject to compliance with requirements, provide one of the following:
        a. Crafco Inc., an ERGON company; RoadSaver Silicone.
        b. Dow Corning Corporation; 888.
        c. Pecora Corporation; 301 NS.
B. Single-Component, Self-Leveling, Silicone Joint Sealant for Concrete: ASTM D 5893, Type SL.
    1. Products: Subject to compliance with requirements, provide one of the following:
        a. Crafco Inc., an ERGON company; RoadSaver Silicone SL.
        b. Dow Corning Corporation; 890-SL.
        c. Pecora Corporation; 300 SL.
C. Multicomponent, Pourable, Traffic-Grade, Urethane Joint Sealant for Concrete: ASTM C920, Type M, Grade P, Class 25, for Use T.
    1. Products: Subject to compliance with requirements, provide one of the following:
        a. Pecora Corporation; Urexpan NR-200.

2.03 HOT-APPLIED JOINT SEALANTS

A. Hot-Applied, Single-Component Joint Sealant for Concrete: ASTM D 3406.
    1. Products: Subject to compliance with requirements, provide one of the following:
        a. Crafco Inc., an ERGON company; Superseal 444/777.
B. Hot-Applied, Single-Component Joint Sealant for Concrete and Asphalt: ASTM D6690, Types I, II, and III.
    1. Products: Subject to compliance with requirements, provide one of the following:
        a. Meadows, W. R., Inc.; Sealtight Hi-Spec or Sealtight 3405.
        b. Right Pointe; D-3405 Hot Applied Sealant.

2.04 JOINT-SEALANT BACKER MATERIALS

A. Round Backer Rods for Cold- and Hot-Applied Joint Sealants: ASTM D 5249, Type 1, of diameter and density required to control sealant depth and prevent bottom-side adhesion of sealant.
B. Round Backer Rods for Cold-Applied Joint Sealants: ASTM D 5249, Type 3, of diameter and density required to control joint-sealant depth and prevent bottom-side adhesion of sealant.
C. Backer Strips for Cold- and Hot-Applied Joint Sealants: ASTM D 5249; Type 2; of thickness and width required to control joint-sealant depth, prevent bottom-side adhesion of sealant, and fill remainder of joint opening under sealant.

2.05 PRIMERS

A. Primers: Product recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.

PART 3 EXECUTION

3.01 INSTALLATION

A. General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated unless more stringent requirements apply.
B. Cleaning of Joints: Clean out joints immediately before installing joint sealants.
C. Joint-Sealant Installation Standard: Comply with recommendations in ASTM C1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.
D. Install joint-sealant backings of kind indicated to support joint sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
    1. Do not leave gaps between ends of joint-sealant backings.
    2. Do not stretch, twist, puncture, or tear joint-sealant backings.
    3. Remove absorbent joint-sealant backings that have become wet before sealant application and replace them with dry materials.
E. Install joint sealants using proven techniques that comply with the following and at the same time backings are installed:
    1. Place joint sealants so they directly contact and fully wet joint substrates.
    2. Completely fill recesses in each joint configuration.
    3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.
F. Tooling of Nonsag Joint Sealants: Immediately after joint-sealant application and before skinning or curing begins, tool sealants according to the following requirements to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint:
    1. Remove excess joint sealant from surfaces adjacent to joints.
    2. Use tooling agents that are approved in writing by joint-sealant manufacturer and that do not discolor sealants or adjacent surfaces.
G. Provide joint configuration to comply with joint-sealant manufacturer's written instructions unless otherwise indicated.
H. Clean off excess joint sealant or sealant smears adjacent to joints as the Work progresses, by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

END OF SECTION 32 1373

This page intentionally left blank

SECTION 32 1723

PAVEMENT MARKINGS

PART 1GENERAL

1.01 SECTION INCLUDES

A. Furnish all labor, materials, equipment, tools, and services required to fully complete all Painted Pavement Marking work as is indicated on the drawings and/or specified herein including, but not limited to, the following described items.
B. Paints for Pavement striping.

1.02 REFERENCES

A. FHWA MUTCD - Manual on Uniform Traffic Control Devices for Streets and Highways; U.S. Department of Transportation, Federal Highway Administration; Current Edition.

1.03 SUBMITTALS

A. Specifications of primer to be used for tape applications.
B. Manufacturer's affidavit certifying paint products meet or exceed material requirements of this section.
C. Sample of prismatic reflector to be used along with manufacturer's statement of the reflector's minimum reflective area and specific intensity at the 0.2 degree observation angle.
D. Manufacturer's recommendation for type of epoxy to be used when installing prismatic reflectors and markers.
E. Samples of each thermoplastic or preformed plastic Pavement markings along with a statement of how the materials will be applied.

PART 2PRODUCTS

2.01 MATERIALS

A. Line and Zone Marking Paint: Acrylic Traffic Marking Paint; color(s) as indicated.
    1. Sherwin Williams; Pro-Park: www.sherwin-williams.com.
    2. Kwal Paint; 5160 Line Striping Paint: www.kwalpaint.com.
    3. PPG; Zoneline: www.ppgpittsburghpaints.com.
    4. Substitutions: See Section 01 6000 - Product Requirements.

PART 3EXECUTION

3.01 CONSTRUCTION EQUIPMENT

A. Use equipment manufactured for Pavement marking. Use workers experienced in operating such equipment.
B. Use equipment capable of applying a strip, or strips with a width tolerance of plus or minus 1/4 inch. Equip the machine with an automatic skip control giving a 10 feet long marked segment and a 30 feet long gap within a linear tolerance of 6 inches over that cycle.
C. If applying glass beads, locate bead applicator directly behind and synchronized with marking applicator.
D. For thermoplastic paint materials, use equipment that is designed to agitate the paint to prevent scorching, discoloration, or excessive high temperatures.

3.02 PREPARATION

A. Broom or flush the surface to remove dirt, loose stones, or other foreign material immediately prior to applying.
B. Apply striping and markings per FHWA MUTCD requirements.
C. Apply all materials in accordance with manufacturer's and ENGINEER's directions.

3.03 APPLICATION

A. Apply Pavement paintings and markings only when Pavement surface is dry and air temperature is above 40 deg. F. during daylight hours.
B. Do not apply paints and markings when rain is anticipated within 12 hours.

3.04 PAINT STRIPING

A. Adjust Pavement striping machine to apply paint at rate recommended by paint manufacturer.
B. Protect the markings until dry by placing approved guarding or warning device wherever necessary. Remove any markings not authorized or smeared or otherwise damaged, or correct as approved by Architect.

END OF SECTION 32 1723

SECTION 32 3113

CHAIN LINK FENCES AND GATES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Furnish all labor, materials, equipment, tools and services required to fully complete all Chain Link Fence and Gate work as is indicated on the drawings and/or specified herein including, but not limited to, the following described items.
B. Standard fence framework, fabric, and accessories.
   1. 96 inches high.
   2. 72 inches high.
   3. 48 Inches high
C. Softball fence framework, fabric, and accessories.
   1. Outfield Fence (72 inches high).
   2. Sideline Fence (72 inches (1.8 m) high).
   3. Backstop Fence (refer to drawings for dimensions).
   4. Pitching area fence (refer to drawings for dimensions).
D. Wire fabric.
E. Manual gates with related hardware.
F. Accessories.
G. Do not include sales tax, refer to Section 00 1115 - Advertisement for Prequalification of Bidders.

1.02 RELATED REQUIREMENTS

A. Section 03 3000 - Cast-in-Place Concrete: Concrete anchorage for posts.

1.03 REFERENCE STANDARDS

A. ASTM A121 - Standard Specification for Metallic-Coated Carbon Steel Barbed Wire; 2013.
B. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2017.
C. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2016a.
D. ASTM A392 - Standard Specification for Zinc-Coated Steel Chain-Link Fence Fabric; 2011a (Reapproved 2022).
E. ASTM A428/A428M - Standard Test Method for Weight (Mass) of Coating on Aluminum-Coated Iron or Steel Articles; 2010 (Reapproved 2014).
F. ASTM A491 - Standard Specification for Aluminum-Coated Steel Chain-Link Fence Fabric; 2011 (Reapproved 2022).
G. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2020.
H. ASTM A1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength; 2018a.
I. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete; 2021b.
J. ASTM F567 - Standard Practice for Installation of Chain-Link Fence; 2014a.
K. ASTM F668 - Standard Specification for Polyvinyl Chloride (PVC), Polyolefin and Other Polymer-Coated Steel Chain Link Fence Fabric; 2017 (Reapproved 2022).

L. ASTM F1043 - Standard Specification for Strength and Protective Coatings on Steel Industrial Fence Framework; 2017a.
M. ASTM F1083 - Standard Specification for Pipe, Steel, Hot-Dipped Zinc-Coated (Galvanized) Welded, for Fence Structures; 2016.
N. ASTM F1665 - Standard Specification for Poly(Vinyl Chloride)(PVC) and Other Conforming Organic Polymer-Coated Steel Barbed Wire Used with Chain-Link Fence; 2008 (Reapproved 2013).
O. CLFMI CLF-FIG0111 - Field Inspection Guide; 2014.
P. CLFMI CLF-SFR0111 - Security Fencing Recommendations; 2014.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide data on fabric, posts, accessories, fittings and hardware.
C. Shop Drawings: Indicate plan layout, spacing of components, post foundation dimensions, hardware anchorage, and schedule of components. See CLFMI CLF-SFR0111 for planning and design recommendations.
D. Samples: Submit two samples of each fence fabric, 12 inch by 12 inch in size illustrating construction andcolored finish.
E. Manufacturer's Installation Instructions: Indicate installation requirements, post foundation, and anchor bolt templates.
F. Project Record Documents: Accurately record actual locations of property perimeter posts relative to property linesand easements.

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.

1.06 GUARANTEE

A. The Contractor shall guarantee this work for a period of One (1) year from date of Substantial Completion. Guarantee shall be on form included in Section 01 7800.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Chain Link Fences and Gates:
1. Western Fence Co.: www.westernfenceco.com.
2. United Fence Co.: www.unitedfenceco.com.
3. Mountain States Fence Co.: www.msfence.com.
4. American Fence Co.: www.americanfence.com.
5. Allied Fence Co.: www.alliedfence.com.
6. Master-Halco, Inc.: www.masterhalco.com.
7. Vinyl Industries; www.Vinyli.com
8. Substitutions: See Section 01 6000 - Product Requirements.

2.02 MATERIALS

A. Posts, Rails, and Frames:
1. ASTM F 1083 Schedule 40 hot-dipped galvanized steel pipe, welded construction.
a. Minimum yield strength of 30 ksi (205 MPa) at Standard Fence and car enclosure
b. Minimum yield strength of 83 ksi (572 MPa) at Outfield Fence and Backstop Fence locations.

B. ASTM A1011/A1011M Designation SS; hot-rolled steel strip, cold formed to pipe configuration, longitudinally welded construction, minimum yield strength of 50 ksi; zinc coating conforming to ASTM F1043 and ASTM F1083.
C. Line Posts: Type I round.
D. Terminal, Corner, Rail, Brace, and Gate Posts: Type I round.
E. Conform to CLFMI CLF-PM0610.
F. Wire Fabric:
    1. Zinc-Coated Steel Fabric: ASTM A392 hot dipped galvanized before weaving GBW.
        a. Size: 2 inch.
        b. Class 2 - 2.0 oz/ft² (610 g/m²).
G. Conform to CLFMI CLF-PM0610.
H. Brace and Tension (Stretcher Bar) Bands: ASTM F626 galvanized pressed steel.
I. Tension (Stretcher) Bars: ASTM F626 galvanized steel.
J. Truss Rod: ASTM F626 galvanized steel.
K. Concrete - Ready-mixed, complying with ASTM C 94/C 94M; normal Portland cement; 3000 psi strength at 28 days, 3 inch slump; 3/4 inch nominal size aggregate.

2.03 COMPONENTS

A. Line Posts:
    1. 36 to 96 inch (914 to 2438 mm) high fence: 2.38 inch (60 mm) diameter.
B. Corner and Terminal Posts:
    1. 36 to 72 inch (914 to 1829 mm) high fence: 3.5 inch (89 mm).
    2. 96 to 144 inch (2438 to 3658 mm) high fence: 4 inch (100 mm) diameter.
C. Gate Posts:
    1. Gate height up to and including 72 inches (1829 mm):
        a. Gate width up to 48 inches (1219 mm): 2.38 (60 mm) diameter.
    2. Gate height from 72 to 144 inches (1829 to 3658 mm):
        a. Gate width from 72 to 144 inches (1829 to 3658 mm): 4 inch (100 mm) diameter.
D. Top, Center, Bottom, and Brace Rail: 1.66 inch diameter, plain end, sleeve coupled.
E. Gate Frame: 1.66 inch diameter for welded fabrication (man type) and 2.38 inch (60 mm) diameter for welded fabrication (traffic type).
F. Brace and Tension (Stretcher Bar) Bands: 12 gage (2.67mm) pressed steel by 3/4 inch (19mm) formed to a minimum 300 degree profile curvature for post attachment. Secure bands using minimum 5/16 inch (7.94 mm) galvanized carriage bolt and nut.
G. Tension (Stretcher) Bars: One piece length equal to 2 inches (50 mm) less than full height of fabric with a minimum cross-section of 3/16 x 3/4 inch (4.76 x 19 mm). Provide tension (stretcher) bars where chain link fabric is secured to the terminal post.
H. Truss Rod Assembly: 5/16 inch (7.9 mm) diameter truss rod with pressed steel tightener.
I. Tie Wire: 9 gage (3.76 mm) galvanized steel wire for attachment of fabric to line posts and rails. Tie wire per ASTM F 626.

2.04 MANUAL GATES AND RELATED HARDWARE

A. Hardware for Single Swinging Gates: 180 degree hinges, 2 for gates up to 60 inches high, 3 for taller gates; fork latch with gravity drop and padlock hasp; keeper to hold gate in fully open position.
B. Hinges: Finished to match fence components.
    1. Brackets: Round.
    2. Mounting: Center.
    3. Closing: Manual.
C. Latches: Finished to match fence components.
    1. Brackets: Round.

2. Locking: Mechanical.

2.05 ACCESSORIES

A. Caps: Cast steel galvanized; sized to post diameter, set screw retainer.
B. Fittings: Sleeves, bands, clips, rail ends, fasteners, fittings and angled connection fittings; galvanized steel per ASTM F 626.

2.06 FINISHES

A. Components (other than fabric) at Standard Fence and car enclosure locations: Galvanized in accordance with ASTM A 123/A 123M, at 1.9 oz/sq ft.
B. Fabric: Class 2 - 2.0 oz/ft² galvanizing.
C. Hardware: Hot-dip galvanized to weight required by ASTM A153/A153M.

PART 3 EXECUTION

3.01 CHAIN LINK FRAMEWORK INSTALLATION

A. Install framework, fabric, accessories and gates in accordance with ASTM F567 and manufacturer's instructions.
B. Locate terminal post at each fence termination and change in horizontal or vertical direction of 30 degrees or more.
C. Space line posts uniformly maximum 96 inches (2438 mm) on center.
D. Concrete Set Posts: Excavate holes in firm, undisturbed or compacted soil. Holes shall have diameter 4 times greater than outside dimension of post, and depths approximately 6 inches (152 mm) deeper than post bottom. Excavate deeper as required for adequate support in soft and loose soils, and for posts with heavy lateral loads. Set post bottom 36 inches (914 mm) below surface when in firm, undisturbed soil. Place concrete around posts in a continuous pour. Trowel finish around post and slope to direct water away from posts.
E. Check each post for vertical and top alignment, and maintain in position during placement and finishing operations.
F. Bracing: Install horizontal brace and truss assembly at mid-height or above for fences 72 inches (1829 mm) and over at each fabric connection to the terminal post. The diagonal truss rod is installed at the point where the brace rail is attached to the terminal post and diagonally down to the bottom of the adjacent line post. Place the truss rod in tension by adjusting the turnbuckle.
G. Top Rail: Install in lengths of 21 feet (6400 mm). Connect ends with sleeves forming a rigid connection, allow for expansion and contraction.
H. Center Rails: Install mid rails between line posts and attach to post using rail end or line rail clamps. A center rail is required for fabric height 120 inches (3048 mm) and over.
I. Bottom Rails: Install bottom rails between posts and attach to post using rail end or line rail clamps.

3.02 CHAIN LINK FABRIC INSTALLATION

A. Install fabric on security side, pull fabric taut; thread the tension bar through fabric and attach to terminal posts with tension bands spaced maximum of 15 inches (381 mm) on center and attach so that fabric remains in tension after pulling force is released. Install fabric so that it is 2 inches (50 mm) +/- 1 inch (25 mm) above finish grade.
B. Secure fabric using wire ties to line posts at 15 inches (381 mm) on center and to rails and braces 24 inches (610 mm) on center, and to the tension wire using hog rings 24 inches (610 mm) on center. Tie wire shall be secured to the fabric by wrapping it two 360 degree turns around the chain link wire pickets. Cut off any excess wire and bend back so as not to protrude so as to avoid injury if a pedestrian may come in contact with the fence.

3.03 CHAIN LINK GATE INSTALLATION

A. Gate Framework: Fabricate chain link gates in accordance with ASTM F 900. Gate frame to be of welded construction. Weld areas to be protected with zinc-rich paint per ASTM A 780. The gate frame members are to be spaced no greater than 96 inches (2434 mm) apart horizontally or vertically.
B. Gate Fabric: Fabric to be stretched tightly and secured to vertical outer frame members using tension bar and tension bands spaced 12 inches (304.8 mm) on center and tied to the horizontal and interior members 12 inches (304.8 mm) on center using 9 gage galvanized steel ties.
C. Swing gates: Installation of swing gates and gate posts shall be per ASTM F 567. Direction of swing shall be as shown on drawings. Gates shall be hung plumb in the closed position with minimal space from grade to bottom of gate leaf. Double gate drop bar receiver shall be set in a minimum concrete footing 6 inch (152 mm) diameter by 24 inches (610 mm) deep. Gate leaf holdbacks shall be installed on all double gates and all gate leafs greater than 60 inches (1524 mm) in width.

3.04 TOLERANCES

A. Maximum Variation From Plumb: 1/4 inch.
B. Maximum Offset From True Position: 1 inch.
C. Do not infringe on adjacent property lines.

3.05 FIELD QUALITY CONTROL

A. See Section 01 4000 - Quality Requirements, for additional requirements.
B. Workmanship: Verify neat installation free of defects. See CLFMI CLF-FIG0111 for field inspection guidance.

END OF SECTION 32 3113

This page intentionally left blank

SECTION 32 84 23

UNDERGROUND IRRIGATION SYSTEMS

This section replaces section 32 84 23 in the 2017 edition of the Utah Chapter of American Public Works Association Manual of Standard Specifications (APWA).

PART 1 GENERAL

1.01 SUMMARY

A. Section includes:
   1. Underground irrigation systems complete with heads, valves, controls, and accessories.
B. Related sections:
   1. Section 32 94 23 Planting

1.02 REFERENCE STANDARDS

A. NFPA 70: National Electric Code.
B. ASTM: American Society for Testing and Materials
C. IA: The Irrigation Association: Main BMP Document, Landscape Irrigation Scheduling and Water Management Document.
D. ASIC: American Society of Irrigation Consultants: ASIC Grounding Guideline
E. City Codes/Ordinances relating to Landscape and Irrigation

1.03 DEFINITIONS

A. Water Supply: Culinary and/or secondary pumping, piping, and components provided and installed by others to provide irrigation water to this project. Includes but is not limited to: storage ponds, pump stations, saddles, nipples, spools, shut-off valves, corporation stop valves, water meters, pressure regulation valves, and piping or components upstream of (or prior to) the Point-of-Connection.
B. Point-of-Connection: Location where the Contractor shall tie into the water supply for landscape irrigation needs and use. Tie to existing piping.
C. Main Line Piping: Pressurized piping downstream of the point-of-connection to provide water to remote control valves and quick coupling valves. Normally piping is under constant pressure.
D. Lateral Line Piping: Circuit piping downstream of the remote-control valves to provide water to sprinkler heads, drip system, or bubblers. Normally piping is under pressure only when control valve is in operation.

1.04 PERFORMANCE REQUIREMENTS

A. The work to be performed under this Section shall consist of furnishing all labor and materials necessary to construct a complete working and tested underground sprinkler irrigation system per all drawings and specifications, providing one hundred (100) percent head-to-head coverage on all lawn and planting areas on the site without overspray onto hardscape, buildings, or other site features. Included also will be system maintenance and warranties.
B. The efficiency of the completed irrigation system shall meet the following minimum standards:
   1. Circuits using spray sprinklers shall perform at a minimum 60% efficiency.
   2. Circuits using rotor sprinklers shall perform at a minimum 70% efficiency.
   3. Efficiency shall be determined by an independent water audit performed by a certified irrigation auditor selected by the Owner. The Contractor shall include in his bid price the cost of this audit. The audit shall be conducted after substantial completion and before final acceptance of the irrigation system.
C. The Contractor shall perform, but not be limited to, all of the following functions: paying all

connection fees, deposits, and all other charges related to the connection to the water source; obtain all permits; complete all excavation and backfill; provide backflow device, tapping saddle, yoke, stop and waste, corp. cock, concrete vaults and miscellaneous pipe fittings; make necessary road repairs; provide safety barrier; make connection to water source; install all electric valves, valve control devices, isolation gate valves, quick coupling valves, drain valves, meter base, conduit, junction boxes, controller, backflow prevention devices and enclosures, filters and enclosures, and all necessary wiring. All work shall comply with applicable codes and requirements of the utility companies involved.

D. If any or all of the above-mentioned fees or charges are not listed on the bidding schedule or on the plan, they shall be included in the bid lump sum price of the irrigation sprinkling system item.

E. Contractor shall verify with the appropriate water district the location of the water service main line and water pressure and complete all requirements necessary to bring water service to the site. Total cost to be included in the irrigation sprinkling system bid item.

F. The above specification statement supersedes the graphic representation location of the contract limit line. This pertains to the water line location on either side of the street adjacent to the project site.

G. All work shall be done in accordance with the drawings and specifications, as well as all applicable water and electrical codes.

H. The Contractor shall operate, maintain until acceptance, and guarantee the new system as specified herein until all lawn and plants installed on this project have become established and have been accepted by the Owner.

1.05 SUBMITTALS

A. Product Data: Complete set of manufacturer's technical data and installation instructions for all equipment to be installed on the project. Submittal shall be made prior to commencement of any irrigation work.

B. Main line and lateral line pressure test results: Submitted at the time of occurrence.

C. Operation and Maintenance (O&M) Manual:
   1. O&M manual shall contain the following information:
      a. Manufacturer cut sheets and current printed specifications for each element or component of the irrigation system.
      b. Parts list for each operating element of the system.
      c. Manufacturer's printed literature on operation and maintenance of operating elements of the system.
      d. Section listing instructions for overall system operation and maintenance. Include directions for spring start-up and winterization.
   2. Manual shall be submitted at least thirty (30) days prior to final inspection and acceptance of the project.

D. Complete As-Built Drawings:
   1. Drawings shall conform to the following criteria:
      a. One (1) 22" x 34" and one (1) 11" x 17" drawing shall be submitted.
      b. All submitted drawings shall be made on a digital format (PDF).
      c. Show detail and dimension changes made during installation.
      d. Include field dimension locations of sleeving, points of connection, main line piping, wiring runs not contained in main line pipe trenches, valves and valve boxes, quick coupling valves.
      e. Dimensions shall be taken from permanent constructed surfaces, features, or finished edges located at or above finished grade.
   2. A complete set of as-built drawings shall also be submitted in electronic digital format (.pdf).
   3. As-Built drawings shall be submitted prior to final inspection and acceptance.

E. Controller Map: Each controller shall be equipped with a color-coded copy of the area that the controller services. Include valve zone number, type of plant material irrigated, and zone location on the project. Laminate map with heat shrink clear plastic and mount inside controller.

1.06 QUALITY ASSURANCE

A. Acceptance: Do not install work of this section prior to acceptance of the area by the Owner as being properly prepared to receive said work (i.e. at proper grade, properly compacted, permanent fixtures in place, etc.).
B. Adequate Water Supply: Contractor shall verify that proper connection is available to supply lines and is of adequate size and volume. Perform static water pressure test prior to commencement of work. Notify Owner of problems encountered prior to proceeding.
C. Workmanship: It is the intent of this specification that all materials herein specified with the best standards of practice relating to the trade.
D. The Contractor shall provide to the City a document or resume which includes the following information:
    1. The Contractor has been installing sprinkler systems on commercial projects for at least ten (10) previous consecutive years.
    2. The Contractor is currently licensed to perform landscape construction in the State of Utah.
    3. The Contractor is bondable and insurable for the work to be performed.
    4. References of at least five (5) projects of similar size and scope completed within the last five (5) years. Three (3) of the projects listed must be located in the general region of the project site.
    5. List of suppliers from whom materials will be obtained for use on this project.

1.07 PROJECT CONDITIONS

A. Any discrepancies between existing site conditions and those indicated on the plans shall be called to the attention of the Landscape Architect or Owner's Representative prior to continuance of the project.
B. The Contractor shall use only the equipment and products specified in the construction drawings. No substitution of materials will be allowed on the irrigation system without prior authorization from the Landscape Architect and the Owner's Representative.
C. During delivery, installation, and storage of materials for the project, all materials shall be protected from contamination, damage, vandalism, and prolonged exposure to sunlight. All material stored at the project site shall be neatly organized in a compact arrangement and storage shall not disrupt the project Owner or other trades on the project site. All material to be installed shall be handled by the Contractor with care to avoid breakage or damage. Materials damaged by the Contractor shall not be used but shall be replaced with new materials at the Contractor's expense.
D. The Contractor shall familiarize himself and his workmen with all hazards and existing utilities prior to commencing work. This shall require local Blue Staking to be completed before any construction activity can begin.

PART 2 PRODUCTS

2.01 GENERAL

A. The Contractor shall provide all materials to be used on this project. The Contractor shall not remove any material purchased for this project from the project site, nor mix these project materials with other contractor-owned materials. The Owner retains the right to purchase and provide project materials.
B. Handling and unloading of all equipment, pipe, and fittings shall be in such a manner as to insure delivery to the job site in a sound, undamaged condition. Any installed equipment or pipe found to be damaged or defective in workmanship or materials shall be rejected and removed and replaced at Contractor's expense.

2.02 PIPE

A. All PVC pipe used on this project for the irrigation system shall conform to the requirements of ASTM -1685. It shall be free of cracks, holes, foreign material, blisters, inside bubbles,

wrinkles, and dents.

B. All main line pipe, three (3) inches inside diameter and smaller shall be Schedule 40 PVC solvent weld bell end unless otherwise specified.

C. All main line pipe, four (4) inches inside diameter and larger, shall be PVC Class 200 gasketed bell end (except as required for conversion to metal fittings).

D. All lateral line pipe shall be Schedule 40 PVC solvent weld.

E. Maximum flows allowed through main line and lateral line pipe shall be determined by water speed in the pipe. The maximum water speed allowed in both main lines and lateral lines is five (5) feet per second. The resulting maximum gallons per minute (gpm) allowed to flow through PVC pipes are as follows:

PIPE SIZE	**GPM**
3/4"	8
1"	12
1 1/4"	22
1 ½"	30
2"	50
2 ½"	75
3"	110
4"	190
6"	425

For sizes larger than 6", consult manufacturer's recommendations.

F. No bends in pipe shall be permitted. The Contractor shall use elbow fittings of ninety (90), forty-five (45), twenty-two and one half (22-1/2), and eleven and one quarter (11-1/4) degrees as individual situations demand.

G. All pipe used from the main line to the control valves shall be solvent weld Sch. 80 PVC pipe unless otherwise noted or shown on the construction drawings.

2.03 FITTINGS

A. All PVC fittings used on this project for the irrigation system shall conform to the requirements of ASTM D-2466.

B. Main Line Fittings:
1. All main line fittings four (4) inches inside diameter and larger shall be either M.J. or deep bell push-on, gasketed, ductile iron.
2. All main line fittings three (3) inches and smaller inside diameter shall be solvent weld Schedule 80 PVC, shall be thrust blocked per details.
3. All main line fittings four (4) inches and larger, whether ductile iron or solvent weld, shall be thrust blocked per details.
4. All main lines three (3) inches and larger having a horizontal change of direction shall have proper concrete thrust blocks installed. Vertical changes in direction shall require the use of M.J or ductile iron fittings with thrust restraining devices (Mega Lug, Harco Knuckle Joint Restraints, or approved equal) in addition to appropriate concrete thrust blocking. The size and type of thrust block depends on pressure, pipe size, type of soil, and type of fitting. As a general rule, one (1) cubic foot minimum of class AA (AE) Type II concrete is required for each thrust block. Follow thrust blocking details for calculating thrust block size.
5. M.J. tees, Schedule 80 tees with SxT Schedule 80 bushings, or Harco ductile iron service tees are approved on PVC main lines for automatic control valve installation. M.J. fittings shall be greased and wrapped.

C. Lateral Line Fittings:
1. All lateral line fittings shall be solvent weld Schedule 40 PVC.
2. All risers and exposed fittings shall be solvent weld Schedule 80 PVC, including conversions to metal pipe and fixtures, unless otherwise noted on the plans.

D. PVC Cement: Solvent weld or glued joints shall use the following materials:
1. Primer: IPS Weld-On P-70 Primer (purple), ASTM F-656.
2. Cement: IPS Weld-On 711 Heavy Bodied PVC Cement (gray), ASTM D-2564.

2.04 VALVES

A. Master Valve: All master valves shall be as specified in the Irrigation Equipment Schedule. Master valve assembly shall be installed according to detail in drawings.

B. Isolation Gate Valve:
   1. Isolation gate valves shall only be used on the main line.
   2. Isolation gate valves shall be as specified in the Irrigation Equipment Schedule. Valves shall be hydrostatically pressure tested for 400 P.S.I. and shall be designated for a working pressure of 200 P.S.I. Each valve shall contain a resilient wedge urethane rubber seat. Unless otherwise shown or specified, valves three (3) inches and larger shall have flanged end connections.
   3. Buried valves shall have two (2) inch square operating nuts. No handles or wheels will be permitted. Valves inside structures (vaults or valve boxes) may have wheel handles if the valve is two (2) inches or less in size.
   4. Action unions shall be installed on each side of all valves except flanged valves.
   5. The Contractor shall provide adequate material for the connection of valves to the system, i.e., adapters, flanges, nuts, bolts, gaskets, etc.
   6. All buried main line isolation valves with a (2) inch square operating nut shall be fitted with a four (4) inch minimum diameter pipe sleeve place over the top of the valve vertically and extended to grade. Cover with a ten (10) inch round plastic valve box with bolt down lid and set at finished grade.
   7. Contractor shall provide appropriate valve key to operate isolation gate valve.

C. Remote Control Valve Assembly:
   1. Remote control valves shall be as specified in the Irrigation Equipment Schedule.
   2. Remote control valves shall be globe configuration, electrically activated, normally closed, forward flow design.
   3. All pipe on the control valve assembly shall be Schedule 80 PVC pipe. See detailed drawings.
   4. Action unions shall be installed on each side of the control valve assembly, allowing valve to be removed from the box for maintenance without cutting pipe.
   5. Each control valve shall have a brass gate or ball valve installed immediately upstream of the valve and located within the same valve box.
   6. Flows through each remote control valve shall not exceed the following limits:

VALVE SIZE	GPM RANGE
1"	1 - 30
1 ½"	31 - 75
2"	76 - 150

   7. Each drip remote control valve assembly shall contain the following components:
      a. PVC ball valve.
      b. Inline disc or screen filter with 100 micron/150 mesh filter element.
      c. Remote control valve capable of operating at very low flow levels.
      d. Inline pressure regulator.

All components shall be installed according to manufacturer's recommendations, and located within a single valve box, one valve per box (no multi-valve assemblies permitted).

D. Quick Coupling Valve Assembly:
   1. Quick coupling valves shall be as specified in the Irrigation Equipment Schedule.
   2. Quick coupling valves shall be heavy duty brass, two-piece, single lug locking cap.
   3. The Contractor shall provide to the Owner at least 1 cap lock key and 1 quick coupling key with a swivel hose bib attached. These keys shall be delivered prior to final acceptance of the project.

E. Manual Drain Valve Assembly:
   1. All manual drains shall be three quarter (3/4) inch heavy duty brass ball valve.
   2. Manual drain valves shall be required at all low points in the main lines. See plans, notes, and details.
   3. The location of each manual drain shall be shown on the "as built" drawing with dimensions from the nearest permanent fixture, such as a building corner, etc.
   4. Each manual drain valve will be accessed by a vertical two (2) inch PVC Schedule 40 pipe sleeve, capped by a locking valve cap with a key, enclosed within a ten (10) inch round green valve box with bolt down lid. The top of the drain sleeve shall be three to six (3 - 6) inches below the lid of the valve box.
   5. Each manual drain shall empty into a gravel sump, a minimum of twenty-four (24) inches by twenty-four (24) inches by eighteen (18) inches deep, (or six (6) cubic feet total capacity). The gravel shall be washed three quarter (3/4) inch rock.
   6. Contractor shall provide appropriate valve key to operate manual drain valve.

F. Automatic Drain Valves: Automatic drain valves shall not be used.

2.05 VALVE BOXES

A. All valve boxes shall be HDPE plastic with locking lid or approved equal.

B. **Valve boxes and lids shall be green when located in lawn areas, and tan, brown, or gray when located in shrub beds (to match the color of the surrounding mulch).**

B. Valve box size shall be listed in the installation details for each irrigation system component.

2.06 BACKFLOW PREVENTION ASSEMBLY

A. Backflow prevention devices shall be a reduced pressure principle backflow preventer consisting of a pressure differential relief valve located between two independently operated spring-loaded "Y" type center guided check valves. Assembly shall also have two full port resilient seated ball valves for shut-off and four resilient seated ball valve test cocks and bronze body construction. Larger sizes (2 ½" and up) may have two non-rising stem resilient wedge gate valves in lieu of ball valves.

B. Backflow preventer shall be as specified in the Irrigation Equipment Schedule.

2.07 SWING-LINE PHYSICAL DISCONNECT ASSEMBLY (NOT USED)

A. Where culinary and secondary water may be used interchangeably for irrigation purposes, a physical disconnect mechanism is required. A swing-line setup is preferred by the City and must meet the following design requirements:
   1. Only one water supply source can be used at any given time.
   2. Two (2) supply lines enter a swing-line box, one from secondary water source and one from culinary water source.
   3. Each supply line must have a shut off valve immediately upstream from the swing-line.
   4. One sprinkler feed line exits the swing-line box.
   5. A flexible line is permanently fastened to the sprinkler feed line and a quick disconnector is attached to the end of each supply line.
   6. The supply line that is not connected to the swing-line must have a secure plug when not in use. Tape is not acceptable.

B. The swing-line shall be made of reinforced flexible pipe material.

C. The quick disconnectors shall be plastic camlock style.

D. The swing-line assembly shall be placed in a large polycrete Carson vault. Vault shall be large enough to accommodate clearance around all valves and camlock fittings and swing of hose from one supply to the other.

2.08 FILTER AND ENCLOSURE (NOT USED)

A. Filters and their enclosures shall be required on all systems using secondary water. Systems using reclaimed water (from a wastewater treatment plant) may not require a filter.
B. Filters shall be as specified in the Irrigation Equipment Schedule. Filters may be either plastic or steel construction, with screen (perforated or weavewire stainless steel) or plastic disc filter elements.
C. Filter enclosures shall be either commercially or custom fabricated. They shall be constructed of solid sheet marine grade aluminum, with one hundred (100) percent stainless steel hardware and locking mechanism. They shall exhibit vandal- and weather-resistance and offer easy access.
D. Enclosures shall be mounted on either a pre-manufactured mounting pad with support base or minimum four (4) inch concrete pads. See detail.

2.09 AUTOMATIC CONTROL SYSTEM

A. Furnish a low voltage automatic control system manufactured expressly for the operation of automatic control valves used in an underground irrigation system.
B. Automatic controller devices shall be as specified in the Irrigation Equipment Schedule. No substitutions shall be allowed. Unless specified otherwise, install as follows:
    1. Install in enclosure as specified in the Irrigation Equipment Schedule.
    2. Whenever a single site has 2 or more controllers, the 2nd and subsequent controllers shall also be mounted in a separate stainless-steel enclosure as specified in the Irrigation Equipment Schedule.
    3. Metered enclosures, if required, shall be mounted on a 4" thick concrete pad. Regular enclosures may use a pre-manufactured mounting system as specified in the Irrigation Equipment Schedule.
C. Provide adequate capacity to accommodate each valve on the system separately. Do not double valves to circuits.
D. The Contractor shall provide 120-volt electrical service to the controller. Where required, install meter inside meter socket of the enclosure. Coordinate this work with the Owner and other trades involved in the project.
E. Every controller shall be installed to control a single point of connection (P.O.C.). That point of connection shall be exclusively associated with that controller. Each P.O.C. assembly shall consist of the main line tap, reverse pressure backflow prevention device (if potable water source), filter (if required), master control valve (if specified), flow sensing device (if specified), manual drain valve, and quick coupling valve. No controller shall be wired to control valves which are connected to another P.O.C.

2.10 CONTROL VALVE WIRE

A. All irrigation control wire shall bear approval as U.L. listed type of underground feeder (direct burial) and each conductor shall be of electrical conductivity grade solid copper in accordance with ASTM 30.
B. No aluminum wire shall be used on this project.
C. Wire size shall be #14 gauge minimum.
D. Two spare wires shall be run from each controller to the farthest valve under its control in all directions and any valve which is on a dead-end line.
E. All wire crossing water, attached to bridges, going under paving, or where conditions require protection, shall be housed in conduit or sleeves. All out-of-ground conduits shall be rigid metal. All buried conduit may be PVC.
F. All splices shall be water-tight. All connections made inside the box to connect wires to the valve shall be made using a 3M DBR/Y dry-splice connector or pre-approved equal. Each connector shall be completely sealed and water-proofed.
G. All other splices in control wire shall be housed in a separate valve box.

H. The pigment or color of the wires shall be integrated into the covering, rather than painted on. All common or ground wires shall be white in color. Where more than one controller is required, a different colored hot wire shall be used for each controller. A separate color shall be used for all spare wires.

2.11 SPRINKLER HEADS

A. General:
   1. All heads used on this project shall be as specified in the Irrigation Equipment Schedule shown on the plans.
   2. All sprinkler heads and nozzles shall be as specified in the Irrigation Equipment Schedule.

B. Spray/Rotary Sprinklers:
   1. Spray/Rotary sprinklers shall have either four (4), six (6), or twelve (12) inch pop-up height and built-in check valve. In areas where water pressures are high or fluctuating, pressure regulating series sprinklers shall be used.
   2. Spray/Rotary sprinkler nozzles shall be plastic matching precipitation rate nozzles. Variable arc nozzles may be used to meet irregular-shaped areas.
   3. Attachment options shall be as specified in the installation details.

C. Rotor Sprinklers:
   1. Rotor sprinklers shall be equipped with stainless steel rotor sleeve and check valve.
   2. Rotor sprinkler nozzles shall be as manufactured for each individual model.
   3. Small rotor sprinklers (½" bottom inlet) may be installed using swing pipe per installation details. Medium (3/4" bottom inlet) and large (1" or greater bottom inlet) rotor sprinklers shall be installed using swing joints as shown in the installation details. Swing joint size shall match sprinkler inlet size.

D. Bubblers, Tree Well, and Root Watering Systems: Installed per manufacturer's recommendations. Use only where and when specified.

2.12 DRIP IRRIGATION

A. Drip irrigation materials shall be as specified in the Irrigation Equipment Schedule.

B. Emitters shall be of the individual, self-cleaning, pressure-compensating type.

C. Dripline tubing shall be constructed of high quality linear, low density, UV-resistant, polyethylene resin materials with internal, integral emitters at specified intervals.

D. All insert barbed fittings shall be constructed of molded, UV-resistant plastic. Each fitting shall have a minimum of two (2) ridges or barbs per outlet. All fittings shall be from the same manufacturer and shall be available in one of the following end configurations:
   1. Barbed insert fittings.
   2. Male pipe threads (MPT) with barbed insert fittings
   3. Female pipe threads (FPT) with barbed insert fittings.

E. Each drip remote control valve assembly shall contain the following components (in required sequence):
   1. PVC ball valve.
   2. Inline disc or screen filter with 100 micron/150 mesh filter element.
   3. Remote control valve.
   4. Inline pressure regulator.

F. Provide the following equipment to each drip valve circuit, located and installed per manufacturer's recommendations:
   1. Line flushing valve(s) - minimum of one (1) on each exhaust header, and one (1) on each supply header.
   2. Air/Vacuum relief valve(s) at all high points in the system if required by the manufacturer.

2.13 FLOW SENSING EQUIPMENT

A. Where specified, each controller shall be installed with its own corresponding flow sensor on a single point of connection to the water source.

B. The flow sensor shall be compatible with the specified controller.

C. Size the flow sensor so that it is able to read the high and low flows of the valves used on that particular controller. Install per manufacturer's specifications.

PART 3 EXECUTION

3.01 GENERAL

A. The irrigation plan is diagrammatic in nature, and some drafting liberties have been taken to maintain the graphic clarity of the drawings. All irrigation equipment shall be located in planting areas only, unless noted otherwise. The Contractor shall install piping to minimize changes in direction, avoid placement under trees or large shrubs, and avoid placement under hardscape features. Refer to the irrigation legend, details, and specifications for equipment and proper installation.

B. Site Visit: The Contractor shall visit and inspect the project site. He shall take into consideration known and reasonably inferable conditions affecting the proposed work. Failure to visit the site shall not relieve the Contractor of furnishing materials and performing the work required. Any discrepancies between existing site conditions and those indicated on the plans shall be called to the attention of the Owner, by the Contractor, prior to continuance of the project.

C. The Contractor shall keep the premises clean and free of excess equipment, materials, and rubbish incidental to work of this project. Work areas shall be swept clean and trash and debris picked up daily. Open trenches or hazards shall be protected with yellow caution tape. The Contractor is responsible for removal and legal disposal (off site) of trash and debris generated by his work on this project.

D. Existing Landscapes:
   1. Where existing landscape areas are a part of the project, the Contractor shall repair or replace work damaged by his irrigation system installation at his own expense. If the damaged work is new, the Contractor or the original installer of that work shall perform repairs at the Contractor's expense. The existing irrigation system and landscape shall remain in place, protected, undisturbed, and functional.
   2. The Contractor shall protect in place and work around all existing plant materials designated to remain.
   3. Coordination of trench and valve locations shall be laid out prior to any excavation work. Plant material deemed by the Landscape Architect or Owner's Representative to be damaged by the Contractor shall be replaced with new plant material at the Contractor's expense. The Contractor shall not cut existing tree roots larger than two (2) inches in diameter. Route pipe, wire, and irrigation components around tree canopy drip lines where possible to minimize damage to tree roots.
   4. The Contractor shall leave no part of the existing landscape without water for more than forty-eight (48) hours at a time.

E. Pre-Construction Meeting: A pre-construction meeting shall be held prior to beginning any work on a project. The Owner and/or Owner's Representative, the project designer, and the Contractor and his Sub Contractors shall all be in attendance.
   1. The purpose of this meeting is to review project goals and expectations, the project schedule, and all procedures relative to inspections, permits, and changes that may arise.
   2. In the pre-construction meeting, it shall be made clear that the construction documents (plans, details, specifications, and contract) shall be binding upon the Contractor and upon all of his work. Any work not in accordance with the plans and specifications shall be rejected, and the Contractor shall bring the project into compliance at his own expense.

3.02 CONSTRUCTION STAKING

A. The Contractor shall provide the necessary staking to obtain the layout shown on the plans. The points of reference shall be as indicated in the drawings and shall include such

features as the walks, buildings, curbs, etc. Any changes in the system which appear necessary due to field conditions must be called to the attention of the Owner/Owner's Representative and Landscape Architect and approved by the Owner at the time they are discovered and prior to making any changes.

3.03 EXCAVATION AND BACKFILLING

A. Excavation:

1. Excavation work shall only be as deep and as wide as will be required to safely perform the work, such as making mainline connections or forming vaults.
2. Trenches shall be deep and wide enough to provide working space for placing two (2) inches of bedding underneath all new mainline pipe and fittings where the soil is rocky or gravelly. Place twenty (20) to thirty (30) inches of cover over the top of all pipe and fittings on main lines. All trench bottoms shall be sloped so the pipes will gravity-drain back to the main connection point or the nearest manual drain. If the existing main line is deeper than thirty (30) inches, the Contractor shall install a riser to a depth of eighteen (18) to thirty (30) inches and then install the new line at the required depth. At no time will the mainline be installed with less than eighteen (18) inches or greater than thirty (30) inches of cover unless prior approval is given by the Landscape Architect or Owner's Representative.
3. Trenches shall be deep enough to maintain twelve (12) to fourteen (14) inches of cover over the top of all lateral line pipe and fittings. They shall be deep enough to guarantee that all swing joints drain back to the lateral lines. Trenches shall be a minimum of twelve (12) inches away from any walks and/or curbs, buildings, or other hardscape improvements. They shall be of sufficient width to accommodate tees and other fittings that come out sideways (horizontally) from the lateral lines. Lateral lines may be pulled by a mechanical puller provided all other applicable specifications are met.
4. Any rocks or other debris over one (1) inch in diameter uncovered during excavation or trenching shall be removed from the area.
5. If more than one (1) pipeline is required in a single trench, that trench shall be deep and wide enough to allow for at least six (6) inches of horizontal separation (if both are lateral lines), or six (6) inches of both horizontal and vertical separation (if one line is a main line) between pipes.
6. Any existing utility lines damaged during excavating or trenching shall be reported immediately to the Landscape Architect, the utility Owner, and the project Owner. After proper notification to the Landscape Architect, the utility Owner, and project Owner, repairs to the damaged utility shall be made immediately. Repair materials and methods shall meet industry standards and the utility Owner's satisfaction. Should utility lines be encountered which are not indicated on the plans, the Owner shall be notified. The repair of any damage shall be done as soon as possible by the Contractor or the utility Owner, and proper compensation to the Contractor shall be negotiated with the Owner. Such utility locations shall subsequently be noted on the "As-Built" drawings required before final payment of the irrigation system contract.
7. Where trenching is done in established lawn, care shall be taken to keep the trenches only as wide as is necessary to accomplish the work. The trenches shall be backfilled as specified and then four (4) inches of approved topsoil placed to bring the trench up to existing grade so that sod can be laid. Only new sod shall be used as trench cover. It shall be established new sod, of standard width, and shall be laid along the trenches so as to match the existing sod. No small pieces of sod shall be used, and only standard lengths shall be accepted. No sod from the construction site shall be used unless otherwise specified. In the event of any backfill settlement prior to the end of the guarantee period, the Contractor shall perform the required repairs at his own expense.

B. Backfilling:

1. No backfilling of trenches shall be done until the system has been inspected and approved by the Landscape Architect or Owner's Representative for proper trench depths, installation of equipment, control wire, and location of heads.

2. Before trenches are backfilled, the Contractor must show the Landscape Architect or Owner's Representative the redlined "As-Built" drawing he has been keeping on the site, indicating that changes and corresponding dimensions have been recorded where such changes have been made.
3. Prior to backfilling, the system shall be tested under pressure for leaks and general operation of the equipment. The main line shall be tested for a period of four (4) hours at a pressure of 120 PSI. Any failures detected during the testing period shall be repaired by the Contractor and the testing shall be repeated. The Landscape Architect shall certify the testing to ensure that it has been completed and that the system has met all testing requirements. All defects discovered by the pressurization and operation test shall be corrected by the Contractor at his own expense before proceeding with further work.
4. Trench bedding and backfill material shall be existing site soil free of rocks larger than one (1) inch in diameter and any other debris. Wasted pipe and other excess project materials or rubbish (tape, wire, trash, wrappers, boxes, bottles, etc.) shall not be backfilled into the trenches. All trenches shall be backfilled, and then watered sufficiently to insure no settling of the surface. In the event of any backfill settlement prior to the end of the guarantee period, the Contractor shall perform all required repairs at his own expense.
5. Backfill under and around the lines to the center line of the pipe shall be placed in maximum layers of six (6) inches and thoroughly compacted. Compaction shall be ninety-five (95) percent relative density (modified proctor) under walks and roads, and eighty-five (85) percent in planting areas.
6. Special care shall be taken to assure complete compaction under the haunches of the pipe. Backfill compaction under the haunches of the pipe shall be compacted to the original density. Compaction requirements above the pipe shall be the same as for surrounding areas.

3.04 POINT-OF-CONNECTION

A. The Contractor shall verify the location of the irrigation point-of-connection (P.O.C.) and the static water pressure at that location prior to beginning any irrigation work. Verify water pressure during the time of day that the irrigation system is intended to operate.
B. If the P.O.C. location or water pressure is different than that expressed by the irrigation designer, or if the pressure appears to be unusually high or low, the Contractor shall notify the Landscape Architect or Owner's Representative immediately prior to beginning any irrigation work.

3.05 ELECTRICAL POWER SUPPLY AND AUTOMATIC CONTROLLER

A. If 120 volt ac electrical service is not already in place, the Contractor shall be required to make all necessary arrangements with the appropriate power company and provide all necessary materials and labor to provide said power, including but not limited to: paying fees, making power connections, providing poles, weatherhead and meter, etc., as specified on the plans or as required by the power company and the Owner. The automatic controller shall be of the type and manufacturer specified and located as shown on the drawings.

3.06 PIPE AND FITTINGS

A. Install pipe to allow for expansion and contraction as recommended by pipe manufacturer. Where the main line sits uncovered for any length of time in the trench prior to testing, the main line shall be shaded with a thin covering of backfill soil to minimize weather-related expansion or contraction of the pipe. Do not cover up valves or other installed equipment prior to inspection and acceptance.
B. The ends of all pipe shall be cut squarely and remain free of all inside scale or burrs. Spigot ends of pipes three (3) inches and larger shall be beveled. Threads shall be cut clean and sharp, and to a length equal to one and one eighth (1-1/8) times the length of the female thread receiving the pipe. The threaded pipe shall be screwed into a full length of

the female thread.

C. All threaded pipe joints shall be properly sealed using Teflon tape that is properly applied to the areas to be joined.

D. Solvent weld joints shall not be glued unless ambient temperatures are at least forty (40) degrees F. Pipe shall not be glued in rainy conditions unless properly tented. Use only the brand and type of primer and glue specified. Glued main line pipe shall cure a minimum of four (4) hours prior to being energized. Lateral lines shall cure a minimum of two (2) hours prior to being energized and shall not remain under constant pressure unless cured for twenty-four (24) hours.

E. Every care shall be taken during installation to prevent dirt and debris (especially rocks and pipe shavings) from getting into the pipes.

F. All tees coming out of main lines for valves and other fixtures shall be vertical and constructed with Sch. 80 PVC pipe.

G. All tees coming out of the lateral lines for heads and other fixtures shall be horizontal so that no direct weight or pressure may be exerted through the head to the top or bottom of the lateral line pipe. Tees on lateral lines shall also be SxSxT to the head swing joints.

3.07 THRUST BLOCKS

A. Thrust blocks are needed wherever the main pipeline:
   1. Changes any direction at tees, angles, and crosses vertical and horizontal.
   2. Changes size at reducers.
   3. Stops at a dead-end.
   4. Valves at which thrust develops when closed.

   The size and type of thrust block depends on pressure, pipe size, type of soil, and type of fitting. As a general rule, one cubic foot (minimum) of class AA (AE) Type II concrete (2,000 psi minimum) is required for each thrust block. Follow thrust blocking details for calculating thrust block size.

B. Thrust blocks shall rest against undisturbed original earth in the direction of thrust.

C. Where a fitting is used to make a vertical bend, use a three-eighths (3/8) inch bar to anchor the fitting to a thrust block braced against undisturbed soil. The thrust block should have enough resistance to withstand upward and outward thrusts at the fitting.

D. Where concrete thrust blocking shall come in contact with PVC pipe, wrap the PVC pipe with a layer of plastic to protect the pipe from any caustic effects that may be caused by the concrete mix.

E. Thrust restraining devices may be used in lieu of thrust blocking, but they must be installed strictly according to manufacturer's recommendations. Use of these devices in lieu of thrust blocking shall be approved by the Owner or Owner's Authorized Representative prior to use.

3.08 PIPE SLEEVES

A. Pipe sleeves shall be required for all piping under all new concrete or other new paving. The size of the sleeve shall be at least twice the size of the pipe or wires to be sleeved. Wires shall be sleeved separately within their own sleeve. All pipe sleeves four (4) inches and smaller in diameter shall be PVC Schedule 40 pipe; sleeves greater than four (4) inches in diameter shall be Class 200 PVC, unless otherwise specified on the drawings.

3.09 VALVES

A. General:
   1. Isolation valves, remote control valves, and quick coupling valves shall be installed according to manufacturer's recommendations and these drawings and specifications.
   2. Valve boxes shall be set over valves so that all parts of the respective valve assembly can be reached for service. Valve box and lid shall be set to be flush with the proposed finished grade.
   3. No valve box shall rest directly upon the valve or any fixture associated with it, including main line and lateral lines. Each valve box shall be centered on the valve assembly it covers. Each valve box shall have four (4) inches of three quarter (3/4)

inch gravel placed in the bottom underneath the valve and lines to reduce the potential of mud and standing water therein.

B. Remote-Control Valve:
   1. Each control valve shall have its own gate or ball valve (as specified), and only one (1) control valve and gate/ball valve per valve box. No valve manifolds shall be allowed.
   2. The bottom of the remote-control valve shall be a minimum of four (4) inches above the gravel.
   3. All control valves shall be located within shrub areas where possible and installed per the details on the plans. No large grouping of valves (greater than 3) in any one spot shall be allowed, unless approved by the Landscape Architect or Owner's Representative.
   4. Control valve assemblies shall be installed no closer to one another then two (2) feet.
   5. No control valve shall be installed more than twelve (12) inches below finished grade.
   6. Tag each control valve with a permanent and non-smearing label indicating its proper controller and valve number as shown on the irrigation plans.

C. Quick Coupling Valve:
   1. Quick coupling valves shall be installed within a ten (10) inch round green plastic valve box, with the top of the valve box at finished grade.

3.10 VALVE BOX

A. Where indicated in the installation details, valve boxes shall rest on concrete pavers only, thus eliminating any weight or pressure from being exerted on the main line or valve inside the valve box. There shall be a minimum of three (3) inches of clear space between the bottom of the valve box lid and the topmost part of the valve (including solenoid).

B. Valve box extensions shall be used where necessary to prevent soil around the valve from collapsing into the space inside the valve box.

3.11 BACKFLOW PREVENTION ASSEMBLY

A. The Contractor shall install backflow prevention equipment behind (downstream from) the point-of-connection to the supplying main and lateral lines. Installation shall comply with local, state, and national codes and regulations, and per manufacturer's recommendations (whichever is most restrictive). See plans and details for more information. Install a quick coupling valve just downstream of the backflow prevention assembly for system blowout purposes.

B. The Contractor shall have the backflow prevention assemblies operation tested within ten (10) days of the time of installation by a certified backflow preventer assembly tester. Testing shall be conducted per state requirements to insure proper and safe operation. Subsequent annual testing at spring start-up shall be the responsibility of the Owner.

3.12 SWING-LINE PHYSICAL DISCONNECT ASSEMBLY (NOT USED)

A. Install swing-line disconnect assembly as shown in the City's detail.

B. Ensure that only one supply line can be operated at any given time.

C. Unused supply shall be plugged with appropriate camlock plug (not dust cover).

D. Culinary water supply line must have a reduced pressure backflow prevention device installed upstream from swing-line.

E. Shut off valves of the type specified in detail must be on each supply line. Shut off valve is not required on irrigation feed line.

F. City must approve vault prior to installation.

3.13 FILTER & ENCLOSURE (NOT USED)

A. The Contractor shall install the filter and its enclosure just downstream from the point-of-connection and upstream from the backflow prevention assembly (if present).

B. The filter shall be equipped with a ten (10) foot length of hose that can be attached to the exhaust port of the filter to direct water and debris away from the enclosure during flushing operations. Auto-flush filter models shall be provided with a permanent method of capturing and directing exhaust water away from the filter assembly without creating

puddles, ponding, or any other nuisance drainage problems.

3.14 WIRE & CABLES

A. Multiple wires in the same trenches shall be banded together at ten (10) foot intervals for protection. Where wires pass under paved areas, they shall be installed in Schedule 40 PVC sleeves, separate from lateral or main lines. These sleeves shall be installed prior to installation of the paving, if possible, and prior to installation of the wires. Sleeves for fourteen (14) gauge wires shall be sized as follows:

NUMBER OF WIRES	SLEEVE SIZE
1 - 10	1"
11 - 18	1 1/4"
19 - 25	1 1/2"
26 - 40	2"
41 - 56	2 ½"
57 - 88	3"
89 - 150	4"

B. All control wires shall be bundled and taped together every ten (10) feet and installed in the pipe trench directly adjacent to the pipe. Control wires not placed in the trenches adjacent to the pipes shall be placed in PVC electrical conduit and buried eighteen (18) inches or deeper and marked on the "as built" drawings.

C. Two (2) spare wires shall be run from each controller to the farthest valve under its control in all directions and to any valve which is on a dead-end line. The spare wires shall be a different color from the regular wires and shall be labeled at both ends. Each spare wire shall be brought up to the surface in each valve box it passes through and coiled with twenty-four (24) inches for use in future connections. Each spare wire shall be tested for continuity prior to final acceptance of the project and guaranteed by the Contractor to be functional. Should the maintenance personnel discover a defect within one (1) year afterwards, the Contractor shall locate the problem and cause it to be repaired at his own cost. Install extra wires as needed for moisture sensors (if used).

D. Run a single 14-gauge wire along the top of the main line to be used for tracking the location of the main line. The color of the tracing wire shall be different than any other wire color used.

E. All wires shall be installed with twenty-four (24) inches of excess wire (coiled) at the end of each wire run, wire splice, and at each controller.

F. Isolation valves, quick coupling valves, manual drain valves, and wire splices not specifically associated with the control valve shall be located in separate valve boxes.

3.15 SPRINKLERS

A. General:

1. All sprinkler heads shall be installed above grade so as to minimize washing of the topsoil and seed during the landscaping establishment period, except those which border paving or flat work of any kind. These heads shall be installed at the finished grade of the adjacent paving or flat work. Prior to final acceptance of the project, all heads shall be raised or lowered to final lawn or planting grade.
2. All sprinkler heads shall be installed using the bottom inlet. No side outlets shall be used. Tape or plug all open ends while installing to prevent debris contamination.
3. Rotor heads located on hillsides shall be adjusted to the downhill side to avoid cutting into the hill by the stream of water and causing erosion.
4. Heads installed in existing sod shall be set at the grade of the soil.
5. All rotor pop-up heads shall be installed at final grade using Lasco unitized swing joint or Spears swing joint riser assemblies. All swing joints must drain by gravity back to the supply lines.
6. All pop-up, shrub spray/rotary, turf spray/rotary, bubbler and strip spray/rotary heads shall be installed as shown in the details.
7. All pipes, lines, and risers shall be flushed thoroughly with water before installation of any heads. All debris and rocks found at that time shall be removed from the area as

soon as possible.

8. All spray sprinklers shall be flushed thoroughly with clean water a second time before installation of nozzles.
9. The Contractor shall adjust all heads to provide a uniform coverage and to keep spray off buildings, walkways, walls, parking areas, and drives.
10. Check valves shall be used where indicated and where necessary to prevent water flow from lower elevation heads when system is turned off. Install per manufacturer's recommendations.

B. Drip Irrigation
   1. Point Source Drip System
      a. Place two (2) drip emitters on opposing sides of each shrub, perennial, and ornamental grass. Place three (3) drip emitters equally spaced around trees. Emitters shall be staked near the edge of the newly planted root ball and inside the watering well.
   2. Inline Drip System
      a. Inline drip tubing shall be spaced approximately equal to the inline emitter spacing. Inline drip tubing spacing may be adjusted to be slightly less than the emitter spacing in order to achieve uniform spacing. For slope applications, place drip tubing laterals parallel to the slope contour. When slopes exceed thirty (30) percent, increase the recommended lateral spacing by twenty-five (25) percent on the lower one third (1/3) of the slope.
   3. Inline dripper tubing shall be installed at finished grade with soil staples and covered with three (3) inches of specified mulch. Supply and exhaust headers shall be installed at normal lateral line depths.
   4. All drip tubing shall be held in place by soil staples and shall conform to the following:
      a. Sandy Soil - One staple per every three (3) feet and two (2) staples on each change of direction (tee, elbow, or cross)
      b. Loam Soil - One staple every four (4) feet and two (2) staples on each change of direction (tee, elbow, or cross)
      c. Clay Soil - One staple every five (5) feet and two (2) staples on each change of direction (tee, elbow, or cross)
   5. Installation of inline drip circuits shall generally conform to the following steps:
      a. Assemble and install ball valve, filter, remote control valve and pressure regulating valve assembly in accordance with installation details.
      b. Assemble and install supply header(s) in accordance with installation details. Tape or plug all open connections to prevent debris contamination.
      c. Install lateral drip lines in accordance with details and relevant specifications and manufacturer's recommendations. Tape or plug all open ends while installing to prevent debris contamination.
      d. Assemble and install exhaust header(s) in accordance with installation details. Tape or plug all open connections to prevent debris contamination.
      e. Install air/vacuum relief valve(s) at the zone's highest point(s) in accordance with installation details.
      f. Thoroughly flush supply header(s) and connect drip lateral lines while flushing.
      g. Thoroughly flush drip lateral lines and connect to exhaust header(s) and any interconnecting lateral lines while flushing.
      h. Thoroughly flush exhaust header(s) and install line flushing valves in accordance with details.

3.16 AS-BUILT DOCUMENTS

A. The Contractor shall keep a current and accurate record of exact dimensioned locations, grades, elevations, and size of all exterior and interior underground piping, valves, and drains. Dimensions shall indicate distances from columns, buildings, curbs, and similar permanent features on the site. This information shall be recorded on a print as the work progresses but shall be permanently recorded in an electronic / digital format (PDF) which shall be given to the Owner before the project is accepted. The PDF shall be a copy of the

original plans, with contractor markups.

B. Final payment for the contract will not be processed until "As-Built" drawings or plans are received by the Owner.

3.17 OPERATIONAL TEST AND MAJOR INSPECTIONS

A. Substantial Completion:
   1. At substantial completion of the irrigation system, the Contractor shall call for an operational and coverage test. Substantial completion shall be defined as the complete installation of all irrigation equipment and completion of all backfilling and grading operations in their entirety. Substantial completion shall not be given for designated portions of the project.
   2. Notice by the Contractor shall be given, in writing, at least three (3) days in advance to the Owner so that proper scheduling can be made for those who are to attend.
   3. At the appointed time, an inspection of all irrigation equipment, including control valve assemblies, controllers, isolation valves, quick coupling valves, drain valves, and sprinklers shall be made. The entire system will be tested for operation, coverage, and head adjustment. Please note that the pressure testing of the main lines shall already have been completed prior to this time.
   4. A list of uncompleted items or repairs (punch list) shall be generated by the Owner and distributed to the Contractor and other involved parties within three (3) days of the operational testing. Each item on the punch list shall be corrected before the system will be approved and accepted by the Owner. The Contractor will be back charged for time spent by the Owner and any consultants who have been brought to the site for a final inspection when the project is not ready for said inspection.

B. Maintenance/Establishment Period:
   1. The duration of the irrigation maintenance period shall be equal to the plant maintenance/establishment period. It shall begin one (1) day after the substantial completion inspection. The Contractor shall complete all punch list items during the maintenance period, as well as maintain and operate the entire irrigation system.
   2. The irrigation Contractor (if different than the landscaping Contractor) shall coordinate with the landscaping Contractor during the entire plant and lawn establishment period on the use, scheduling, and maintenance of the sprinkler system.
   3. The maintenance period shall not end until Final Acceptance of the project.

C. Final Acceptance:
   1. A second inspection shall be held at the end of the maintenance period to ensure that all punch list items have been completed and the entire system is ready for acceptance by the Owner.
   2. Upon satisfaction that the Contractor has completed all punch list items, the irrigation system is fully and completely functional, and the required As-Built drawings (PDF) and maintenance manuals have been submitted, the Owner shall accept the project.
   3. An official letter of final acceptance shall be prepared and issued by the Owner to the Contractor and Landscape Architect. Upon acceptance of the system by the Owner, the Owner shall assume full responsibility for the system, and the guarantee period shall begin.

3.18 GUARANTEE AND MAINTENANCE

A. Guarantee:
   1. Upon final acceptance of the irrigation system as being operational and properly installed, the Contractor shall guarantee the workmanship, materials, fixtures, and equipment to be free from defects for a period of one (1) year after that date.
   2. The Contractor shall insure and guarantee complete drainage of the system. In working with or connecting to an existing system, the Contractor shall guarantee compatibility in operation and drainage between the two systems.

B. Maintenance Required During Guarantee Period:
   1. In the fall of the year during the installation and guarantee period, the CONTRACTOR shall meet with the Owner’s maintenance personnel on the site. The Contractor shall

winterize the system by draining all of the water and doing everything necessary to insure protection of the system until spring. Blowing out the lines by compressor shall be permitted during the one (1) year guarantee. Maximum compressor pressure shall be 30 psi on spray circuits, 50 psi on rotor circuits, and 20 psi on all drip circuits. The individuals involved from both parties shall exchange all information necessary for the eventual take-over of the system by the Owner.

2. The Contractor, with the Owner's maintenance personnel and Owner in attendance, shall energize the sprinkler irrigation system again the following spring and shall repair all defects found as a result of winter damage, improper installation, improper maintenance, defective materials or inadequate sprinkler drainage.
3. At the end of the guarantee period, when the lawn and landscaping have been accepted, the Contractor shall call for a final inspection of the sprinkler irrigation system. There shall be at least five (5) days prior notice given in writing to the Owner so the appropriate people have opportunity to attend.
4. Prior to that time, the Owner shall adjust all heads to their proper pattern, radii, and height. The system shall have been flushed out, checked for operation, and any defects covered by the guarantee shall be repaired. The entire system shall be inspected and checked to determine if everything is in working order. A final list of warranty items found in need of correction (if any) shall be made and the Contractor shall correct them. The Contractor shall notify the Owner when he has verified that every item is corrected.
5. After all warranty items have been corrected, the Owner shall, in writing, officially release the Contractor from all warranty claims pertaining to the irrigation system and assume full and complete responsibility for said system.

END OF SECTION

SECTION 32 91 19

LANDSCAPE GRADING

This specification replaces in its entirety Section 32 91 19 - Landscape Grading currently found in the Utah Chapter APWA Manual of Standard Specifications - 2017 Edition.

PART 1 – GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Final grade topsoil for finished landscaping.

B. Related Sections:
   1. Section 31 05 05 - Earthwork.
   2. Section 32 94 23 - Planting.

1.2 SUBMITTALS

A. Submit maximum laboratory dry density and optimum laboratory moisture content for:
   1. Subgrade material
   2. Each type of fill material to be used.

1.3 QUALITY ASSURANCE

A. Do not change material sources or aggregate without Landscape Architect's knowledge.

B. Reject backfill material that does not comply with requirements specified in this section.

C. Landscape grading is aesthetic by nature and subject to continual monitoring and modification during the backfilling process. Work closely with the Engineer, particularly when grading and constructing berms, channels, or other aesthetic considerations.

1.4 STORAGE

A. Safely stockpile backfill materials.

B. Separate differing materials, prevent mixing, and maintain optimum moisture content of back fill materials.

C. Avoid displacement of and injury to Work while compacting or operating equipment.

D. Movement of construction machinery over Work at any stage of construction is solely at the Contractor's own risk.

1.5 SITE CONDITIONS

A. Do not place, spread, or roll any backfill material over material that is damaged by water. Remove and replace damaged material at no additional cost to the Owner.

B. Control traffic and erosion. Keep area free of trash and debris. Repair settled, eroded, and rutted areas.

C. Reshape and compact damaged structural section to required density.

1.6 WARRANTY

A. Any settlement noted in the landscaped surfaces will be considered to be caused by improper compaction methods and shall be corrected at no cost to the Owner.

B. Restore incidentals damaged by settlement at no additional cost to the Owner.

PART 2 - PRODUCTS

2.1 TOPSOIL

A. All planting areas shall receive either a minimum of four (4) inches of stockpiled or imported topsoil in turf areas and twelve (12) inches in planting beds, unless otherwise noted on the plans.

B. All topsoil used on this project (stockpiled or import) shall meet the following criteria:
1. pH:..... 5.5 - 8.0
2. EC (electrical conductivity):..... <2.0 mmhos per centimeter
3. SAR (sodium absorption ratio):..... <3.0
4. % OM (percent organic matter):..... ≥2%
5. Texture (particle size per USDA classification):
   a. ..... Sand: <70%
   b. ..... Clay: <30%
   c. ..... Silt: Balance
6. Stone Fragments (gravels or any soil particle greater than two (2) mm in size): ..... <5% (by volume)
7. Rocks Present > 1.5” ..... None

C. In addition, the topsoil shall be fertile, friable, natural loam and shall be capable of sustaining vigorous plant growth. It shall be free of stones, lumps, clods of hard earth, plants or their roots, sticks, and other extraneous matter. The topsoil shall contain neither noxious weeds nor their seeds. It shall not be used for planting operations while in a frozen or muddy condition.

2.2 BACKFILL MATERIALS

A. Earthwork, Section 31 05 05.

2.3 ACCESSORIES

A. Water. Make arrangements for sources of water during construction and plan for delivery of water to the site. Comply with local Laws and Regulations at no additional cost to the Owner when securing water from water utility company.

PART 3 – EXECUTION

3.1 EXAMINATION

A. Administrative Requirements: Verification of existing conditions before starting work.

B. Verify trench backfilling has been inspected.

3.2 PREPARATION

A. Identify required line, levels, contours, and datum.

B. Stake and flag locations of underground utilities.

C. Upon discovery of unknown utility or concealed conditions, notify the Engineer.

D. Verify stockpiled fill meets gradation requirements, areas to be backfilled are free of debris, snow, ice or water, and ground surface is not frozen.

E. If subgrade is not readily compactable, secure written authorization for extra excavation and backfill.

3.3 SUBSTRATE PREPARATION

A. Eliminate uneven areas and low spots.

B. Remove debris, roots, branches, and large stones. Remove contaminated subsoil.

3.4 PROTECTION

A. Protect existing trees, shrubs, lawns, existing structures, fences, reads, sidewalks, paving, curb and gutter, and other features.

B. Protect above or below grade utilities. Contact utility companies to repair damaged top utilities. Pay all costs of repairs.

C. Protect subgrade from desiccation, flooding, and freezing.

D. Do not fill adjacent to structures until excavation is checked by the Engineer.

E. Do not use compaction equipment adjacent to walls or retaining walls that may cause wall to become over-stressed or moved from alignment.

F. Do not disturb or damage foundation perimeter drainage, foundation, damp-proofing, foundation waterproofing and protective cover, or utilities in trenches.

G. Restore any damaged structures to its original strength and condition.

H. Prohibit construction traffic over topsoil.

3.5 LAYOUT

A. Maintain all benchmarks, control monuments and stakes, whether newly established by surveyor or previously existing. Protect form damage and dislocation.

B. If discrepancy is found between Contract Documents and the site, the Engineer shall make such minor adjustments in the Work as necessary to accomplish the intent of the Contract Documents without increasing the cost of the Work to the Contractor or the Owner.

3.6. GRADING

A. Grading Intent: Spot elevations and contours indicated are based on the best available data. The intent is to maintain constant slopes between spot elevations. If a spot elevation is determined to be in error, or the difference in elevation between points change, then the minimum percentage of slope as a result of field adjustment of specific spot elevations is as follows:
   1. Pavement Areas:..... 1 percent.
   2. Concrete or Brick Areas:..... 0.30 percent
   3. Lawn or Planted Areas:..... 0.75 percent.

B. Conduct the Work in an orderly manner. Do not create a nuisance. Do not permit soil accumulation on streets or sidewalks. Do not allow soil to be washed into sewers and/or storm drains.

C. Grade slopes to provide adequate drainage after compaction. Do not create water pockets or ridges. Use all means necessary to prevent erosion of freshly graded areas during construction until surfaces have been constructed and landscaping areas have taken hold.

D. Remove surface stones greater than 1 inch from finished grading.

E. In planting areas, provide a finished grade that conforms to Section 32 94 23 Planting.

3.7 PLACING TOPSOIL

A. Place topsoil in areas and depths as indicated on the plans and specifications. Place topsoil during dry weather.

B. Fine grade topsoil to eliminate rough or low areas. Maintain profiles and contour of subgrade.

C. Remove roots, weeds, rocks, and foreign material while spreading.

D. Manually spread topsoil close to trees and buildings to prevent damage.

E. Lightly compact placed topsoil.

F. Remove surplus subsoil and topsoil from site.

3.8 TOLERANCES

A. Top of Topsoil: ±1/2 inch.

3.9 SCHEDULE

A. Compacted topsoil thickness: 4 inches under turf areas, 12 inches in planter bed areas (unless specifically otherwise stated).

3.10 SURFACE RESTROATION

A. Restore paved surfaces, Section 33 05 05.

B. Finished landscaped surfaces with grass, or with other groundcover shall comply with the following:
1. Backfill areas to contours and elevations indicated. Do not use frozen materials.
2. Make smooth changes in grade. Blend slopes into level areas.
3. Remove surplus backfill materials from site and dispose of legally.
4. Leave stockpile areas completely free of excess fill materials.
5. Slope grade away from buildings at a minimum of 3 inches in 10 feet unless specified otherwise.

3.11 CLEANING

A. Remove stockpiles from the site. Grade site surface to prevent free standing surface water.

B. Leave borrow areas clean and neat.

END OF SECTION 32 91 19

SECTION 32 94 23

PLANTING

This section replaces section 32 92 00, 32 93 13, 32 93 43 and 32 98 00 in the 2017 edition of the Utah Chapter of American Public Works Association Manual of Standard Specifications (APWA).

PART 1 GENERAL

1.01 SUMMARY

A. Section includes:
   1. Trees, shrubs, perennials, vines, and groundcover requirements.
   2. Bedding, topsoil, and temporary support.

B. The work to be performed under this section shall consist of furnishing all materials, labor, and plants necessary for the proper planting or all trees, shrubs, perennials, vines, and groundcovers of the kind and sizes specified at the prescribed locations, and otherwise in accordance with the drawings and specifications or as directed by the Landscape Architect or Owner's Representative or Owner's Representative.

C. Related sections:
   1. Section 32 84 23 Underground Irrigation Systems

1.02 REFERENCES

A. AAN: American Associations of Nurserymen, Inc.
B. ANSI Z60.1-2004: American Standard for Nursery Stock.
C. FS O-F-241: Fertilizers, Mixed Commercial.
D. ICN: International Code of Nomenclature for algae, fungi, and plants.
E. City Standards/Ordinances relating to irrigation and planting.

1.03 QUALITY ASSURANCE

A. Perform work in conformity with applicable requirements of AAN.
B. Upon receiving Notice to Proceed, the Contractor shall provide written proof that the specified plant material is available and has been secured or reserved specifically for this project. Obtain nursery stock and other plant materials from reliable and stable sources prior to order and delivery.
C. Provide plants that are declared free of disease and insect pests.

1.04 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Exercise care in digging, transporting, handling, and packing of all plants.
B. Handle plants so roots are protected at all times. If delivery is in open vehicles, cover entire load without causing over heating.
C. Deliver plant material immediately prior to placement. Keep plant material moist.
D. Protect root balls from sun and wind by covering with soil or other suitable material if not planted immediately on delivery.
E. Store fertilizer in a weatherproof location such that its effectiveness will not be impaired.

1.05 ACCEPTANCE

A. Plants shall not be accepted if the ball of earth surrounding roots (rootball) has been cracked or broken.
B. Plants shall be accepted if burlap, staves, and ropes required in connection with transplanting are installed and still intact upon delivery.
C. Heeled in stock from cold storage shall not be accepted.

1.06 SAMPLES

A. Samples of the topsoil, bark mulch, fertilizer, and tree ties listed below shall be submitted to the Landscape Architect or Owner's Representative for inspection and approval prior to the beginning of work under this contract.
B. Delivery of materials may begin only after samples have been approved. All materials furnished for the work shall conform in every respect to the approved samples. Any non-conforming materials will be rejected.

PART 2 PRODUCTS

2.01 GENERAL

A. The planting plan is diagrammatic, and all plant locations are approximate. Plant symbols take precedence over plant quantities shown on the plans and in the plant material schedule. The Contractor shall verify all plant quantities and notify the Landscape Architect or Owner's Representative of any discrepancies between the quantities and the symbols shown.

B. Provide plants of normal growth and uniform height, according to species, with straight canes and well developed leaders, roots, and tops.

C. Provide plants of sizes indicated. The size stated in each case shall be interpreted to mean dimensions of plant as it stands in its mature position in the nursery without straightening of any branches or leaders.

D. Provide legible labels attached to all plants, specimens, bundles, boxes, bales, or other containers indicating botanical genus, species, and size of each.

E. Plants cut back from larger sizes to meet specifications shall be rejected.

F. Balled and burlapped deciduous shrubs may be acceptable in lieu of container growth deciduous shrubs only if there is a demonstrated significant shortage of container grown stock.

2.02 PLANTS

A. All plants shall comply with federal and state laws requiring inspection for plant disease and infestations.

B. Any inspection certificates required by law shall accompany each delivery of plants and such certificate shall be given to the Landscape Architect or Owner's Representative. All plants shall be subject to inspection and approval at the place of growth or upon delivery to the site for their quality, size, species, and variety. Such approval shall not impair the right of inspection and rejection at the site or during progress of work for size and condition of the plants, latent defects, or injuries. Any and all rejected plants shall be removed immediately from the premises by the Contractor. The Contractor shall make all replacements at his expense should he fail to comply in full with any of the specifications. Necessary replacements will be made as soon as weather conditions permit, and all such plants replaced shall conform to all specifications herein.

C. Names and Grades:

1. Plant names shall conform to the nomenclature of "Standardized Plant Names," "International Code of Nomenclature for algae, fungi, and plants (ICN)," or "International Code of Nomenclature for Cultivated Plants (ICNCP), 9th edition." When a name is not found in any of these references, consult the accepted name used in the nursery trade. All plants shall be tagged by the nursery with the proper identification labels to insure the correct varieties of plants.
2. Size and grading standards shall conform to those of the American Association of Nurserymen, Inc., as published in "American Standard for Nursery Stock", 2014 Edition, with all current revisions unless otherwise specified.
3. The caliper of trees shall be measured six (6) inches above the surface of the ground.
4. Measurements on all trees and shrubs shall be taken with the branches in a normal position. Height and spread dimensions specified refer to the main body of the plant and not from branch or root tip to tip. No trees which have had their leaders cut, or are so damaged that cutting is necessary, will be accepted.

D. No substitution of size, grade, variety or any species shall be permitted except by written permission of the Landscape Architect or Owner's Representative.

E. Plant Size:

1. All plants shall conform to the size, age, and condition as specified in the plant list shown on the drawings. Undersized plant material shall not be approved.
2. No additional compensation shall be due the Contractor if larger than specified plant material is provided.
3. Only balled and burlapped or container stock shall be accepted. No bare root

stock shall be accepted.

4. Plants cut back from larger sizes to meet specifications shall be rejected.

F. Plant List:
1. Plants lists indicate minimum size requirements only. Plant materials shall be equal to or greater in size than those specified.
2. Any discrepancies between plant lists and plans shall be immediately brought to the attention of the Landscape Architect or Owner's Representative.
3. In all cases the Contractor shall be held responsible for all plant materials indicated on the plans unless otherwise directed in writing by the Landscape Architect or Owner's Representative.
4. Each bidder shall investigate sources of supply and satisfy himself that he can supply all of the plants mentioned in the planting lists in size, variety, and quantity noted and specified before submitted his bid. Failure to take this precaution will not relieve the successful bidder from his responsibility as Contractor to furnish and install all plant material in strict accordance with the contract requirements without additional expense to the owner.
5. If a shortage of the specified plant material truly exists and can be verified by the Contractor, the Contractor shall notify the Landscape Architect immediately and discuss what varieties and sizes are available as a suitable substitution. Last minute substitutions are not acceptable.

G. All plants shall be fresh and vigorous, of normal habit and growth, and free of disease, insects and insect eggs and insect larvae, weeds and weed seed. No heeled-in plants from cold storage shall be accepted except on approval by the Landscape Architect or Owner's Representative prior to installation.

2.03 SEED (NOT USED)

A. All seed shall be accurately labeled and tested for purity and germination, using the procedure sanctioned by the Association of Official Seed Analysts.

B. The seed tag shall indicate the date of testing, along with the testing results showing purity (percentage of the labeled species by weight), the percentages of other crop, weed, inert material, dormant or hard seed, and also the percentage of seed that will germinate.

C. Seed labels or tags shall list the following:
1. Manufacturer's name and address.
2. Date and location of packaging.
3. Name of the species of seed or seeds being sold.
4. Variety of seed or seeds being sold.
5. Percent purity of the seed. (Purity is defined as the percent weight of the entire sample of each seed species or variety that is present in excess of 5% of the total.)
6. Percent other seed crop. (Other seed crop is defined as the percent weight of the entire sample of seed found in the sample that are less than 5% of the total seed weight and are generally recognized by the Association of Official Seed Analysts as seeds or plants grown as crops. If more than one crop species or cultivar is found in the sample, their weights are combined and reported.)
7. Percent weed seed. (Weed seeds are all other seed species that the Association of Official Seed Analysts does not classify as crop seeds.)
8. Percent inert matter. (Inert matter is defined as the percent weight of the sample that is not viable seed. It can include plant parts, broken seeds or other materials that are not viable seeds.)
9. Percent germination.
10. Percent hard and/or dormant seed. (Hard seed is the percent of the number of seeds that remain hard at the end of the testing period because they have not absorbed water because of an impermeable seed coat. Dormant seed is defined as the percent of the number of seeds, other than hard seed, that fail to germinate, but are determined to be viable by subjecting them to other seed testing techniques. Both of these seed types are generally considered to be seed that will germinate at a later date than seed reported in the percent germination calculation.)
11. Percent Total Viability.

12. Noxious weed seeds of the continental USA found in the seed mix.
13. Last date the seed was tested for germination.
14. Bulk pound quantity of seed contained in the bag.
15. Pure Live Seed (PLS) pound quantity contained in the bag.

2.04 SOD

A. Sod shall be obtained only from approved sources. The sod shall have been mowed regularly and carefully maintained from planting to harvest.

B. The sod shall be free of grassy and broad-leaf weeds, contain no bare or burned spots, and be clean and strongly rooted. It shall be of the varieties noted on the plans and notes.

C. The sod shall be cut using approved methods and equipment. It shall be cut in pieces not exceeding one (1) square yard, with a minimum of three quarter (3/4) inch and maximum one and one half (1 ½) inch thickness. All sod for a particular contiguous area must have the same thickness.

D. For very large turf areas and all athletic fields, large roles of sod shall be used. All sod roles shall be of uniform and consistent thickness within the range described above.

2.05 TREE STAKES & TIES

A. Tree stakes shall be two by two (2x2) inch square or two (2) inch diameter round wood stakes ten (10) feet in length as indicated on the plans. Steel stakes may not be used.

B. Tree stake ties shall be manufactured of virgin flexible vinyl meeting ASTM-D-412 standards for tensile and elongation strength. The material shall be black in color for ultraviolet resistance. Hose and wire shall not be used.

2.06 TOPSOIL

A. All planting areas shall receive either a minimum of four (4) inches of stockpiled or imported topsoil in turf areas and twelve (12) inches in planting beds, unless otherwise noted on the plans.

B. All topsoil used on this project (stockpiled or import) shall meet the following criteria:

1. pH:..... 5.5 - 8.0
2. EC (electrical conductivity):..... <2.0 mmhos per centimeter
3. SAR (sodium absorption ratio):..... <3.0
4. % OM (percent organic matter):..... ≥2%
5. Nitrogen (NO_3N)..... 48 ppm min.
6. Phosphorous (P) ..... 11 ppm min.
7. Potash (K) ..... 130 ppm min.
8. Iron (Fe) ..... 5.0 ppm min.
9. Texture (particle size per USDA classification):
   a. Sand:..... <70%
   b. Clay: ..... <30%
   c. Silt: ..... Balance
10. Stone Fragments (gravels or any soil particle greater than two (2) mm in size): ..... <5% (by volume)
11. Rocks Present > 1.5” ..... None

C. In addition, the topsoil shall be fertile, friable, natural loam and shall be capable of sustaining vigorous plant growth. It shall be free of stones, lumps, clods of hard earth, plants or their roots, sticks, and other extraneous matter. The topsoil shall contain neither noxious weeds nor their seeds. It shall not be used for planting operations while in a frozen or muddy condition.

2.07 WEED BARRIER FABRIC

A. If specified, a weed barrier fabric shall be placed in all planting beds to prevent the growth and spread of unwanted vegetation. The fabric shall be Typar #3301B or approved equal.

2.08 MULCH

A. Mulch shall be used as a top dressing for all planting beds unless specified otherwise. See plant material schedule for mulch types to be used.

B. Shredded bark mulch shall conform to the following criteria:

1. Bark pieces shall not exceed two (2) inches when passed through a screen of that size.
2. Large chunks of bark or wood shall not be mixed in with the mulch.
3. The bark mulch shall be primarily from coniferous trees.

C. Where used, mulch shall be place to a depth of three (3) inches on top of the topsoil, unless a greater depth is noted on the plans.

D. Other mulches may be used only as specified on the drawings or in the planting notes and details.

2.09 FERTILIZER

A. Commercial fertilizer shall be uniform in composition, dry, and free-flowing. Deliver fertilizer mixed as specified in bulk or bag, showing weight analysis, formula, and manufacturer's name.

B. A 16-16-16 balanced fertilizer shall be used. Any exceptions to this formula shall be based on horticultural recommendations resulting from a site-specific soil test and must be approved prior to application by the Landscape Architect or Owner's Representative.

2.10 MOWSTRIP

A. Where turf areas are separated from planting beds, a concrete mowstrip shall be used. No other edging materials may be used unless specifically noted on the plans and approved by the Landscape Architect or Owner's Representative.

B. The mowstrip shall constructed using concrete having a compressive strength rating of two thousand five hundred pounds per square inch (2,500 psi) or greater, and a maximum slump of four (4) inches.

C. A three eighth (3/8) inch diameter rebar (#3) shall be used to provide support and help prevent differential settling of the mowstrip after cracking.

D. Include a concrete mowstrip at the base of all fences. Said mowstrip shall be six (6) inches deep and eighteen (18) inches wide, with the fence posts located in the center of the mowstrip.

2.11 METAL EDGING

A. Where specified on the plans, metal edging shall be of the product or material specified on the plans (or approved equal).

PART 3 EXECUTION

3.01 GENERAL

A. Site Visit: The Contractor shall visit and inspect the site. He shall take into consideration known and reasonably inferable conditions affecting work. Failure to visit the site will not relieve the Contractor of furnishing materials and performing the work required.

B. Prior to any planting operations, the irrigation system shall be fully operational and all planting areas shall be thoroughly moistened.

C. Where weeds or other undesirable vegetation are present in planting areas, the Contractor shall apply a contact herbicide a minimum of ten (10) days prior to commencement of any planting or irrigation work. Apply herbicide per manufacturer's recommendations. The poisoned vegetation shall be allowed to completely die back, including the roots, before proceeding with the work. Dead vegetation shall then be removed from the site and disposed of in a legal manner.

D. The Contractor shall conform to the following requirements with regard to existing vegetation:

1. The Contractor shall be fully responsible for any damage to existing trees or shrubs. He shall use all reasonable means to protect and preserve plants on the project not designated for demolition.
2. No pruning, thinning, or cutting of existing vegetation shall be allowed unless written permission is given by the Landscape Architect or Owner's Representative.
3. The Contractor shall replace any trees or existing shrubs damaged by him or his sub-contractors with like kind and size.

3.02 PLANTING SEASONS

A. All new plant installation shall be completed between April 15 and October 15. If planting must be done after October 15 or before April 15, the Contractor shall obtain specific approval to do so from the Landscape Architect or Owner's Representative prior to beginning any planting operations.

B. No planting shall be done in frozen soil or during unfavorable weather conditions, subject to the approval of the Landscape Architect or Owner's Representative.

3.03 TOPSOIL

A. The Contractor shall obtain a soil analysis from any authorized soil testing agency of any existing stockpiled or imported topsoil to be used on the project to verify that it conforms to the topsoil specifications. Test results shall include horticultural recommendations. The soil samples shall be obtained per the testing agency directions. Allow ten (10) working days to obtain test results. The costs for such testing shall be the responsibility of the Contractor.

B. Prior to delivery of the imported topsoil to the site, the Contractor shall provide to the Landscape Architect or Owner's Representative the name and location of the topsoil source, along with the certified soil analysis of the topsoil to be used. The analysis shall verify that the proposed topsoil meets the topsoil specifications and is capable of supporting healthy plant growth.

C. After imported topsoil has been delivered to the site, a second soil test may be required to verify that it is indeed the same soil as previously tested and designated for use in this project. No substitution of topsoil shall be allowed without prior written authorization from the Landscape Architect.

D. The following procedure shall be followed in placing all topsoil:

1. All cut areas to receive topsoil which have a slope of less than ten (10) percent shall be cross-ripped to a depth of two (2) to four (4) inches.
2. The subgrade material shall be rough graded to plus or minus one tenth (±0.1) foot of the final rough grade, which will allow the Contractor to achieve final finished grade through the placement of the topsoil.
3. The surface of the subgrade shall be scarified to a depth of two (2) inches to provide a transition zone between the subgrade and the topsoil. Place the topsoil on the subgrade and fine grade to the final finished grade and topsoil depths as indicated on the drawings and in these specifications.
4. Any required soil amendments (i.e. mulch, organic matter, etc.) shall be placed directly on the topsoil at the required rates and spread evenly over the planting area. The amendments shall then be thoroughly blended into the topsoil to a depth of four (4) inches. Where only a dry, granular fertilizer is to be added, it may be applied to the surface and raked in during the fine grading procedures.

E. The Contractor shall maintain a minimum of two (2) percent drainage away from all buildings, structures, and walls. Finished grades shall be smoothed to eliminate puddling or standing water.

F. All finished grades shall be approved in writing by the Owner prior to installation of any plant materials.

G. See Sport Field Grading specifications for instructions regarding sports field surfaces.

3.04 PLANT CONDITION

A. All precautions customary in commercial landscape installation practice shall be taken in preparing plants for planting. Workmanship that fails to meet these minimum standards shall be rejected. All balled and burlapped plants shall have firm and natural balls of earth around their roots. No plant shall be planted if the rootball is cracked or broken, either before or during the process of planting. Loose, broken or manufactured root balls shall be rejected.

B. All plants materials in five (5) gallon containers or larger shall have been established in that container for a period of not less than six (6) months and not more than two (2) years. Plant material shall not be root bound. They shall exhibit sound, healthy, and vigorous growth and be free from diseases and pests.

C. The Contractor shall have the Landscape Architect or Owner's Representative approve plant material size and quality prior to installation. Any plants which are not true to form,

appear stressed or unhealthy, are infested with pests, infected with disease, or are undersized for their containers shall be rejected.

D. All plant material shall be planted as soon upon arrival on the premises as possible. If planting cannot be done immediately, the roots shall be protected from the sun and kept in a moist condition until the time of planting. Such protection may be provided by laying the plants on the north side of the building and covering the roots with wet straw.

E. If it is anticipated that planting will not be done for more than twenty-four (24) hours after the arrival of plants upon the premises, the balled and burlapped stock shall be heeled-in on the north side of a building and all roots completely covered with dirt which shall be wetted down frequently. Care will be taken in the handling of all ball and burlap materials so that the earth around the roots is disturbed as little as possible.

3.05 PLACEMENT OF PLANTS

A. Plants shall be generally located as indicated by the drawing. The Contractor shall stake out the location of all plants and planting areas with identified plant stakes, and no excavation shall commence until such locations have been approved by the Landscape Architect or Owner's Representative or Owner's Representative.

B. In the event that underground construction work or obstructions are encountered during excavation of the plant holes, alternate locations will be assigned and approved by the Landscape Architect or Owner's Representative or Owner's Representative.

C. Except for turf and groundcovers, plants shall not be placed within twenty-four (24) inches of sprinkler heads.

D. The Contractor must locate and stake any sprinkling head or valve box within the dripline of a proposed or existing tree location and must establish the direction of the lateral or main irrigation line that serves the staked sprinkler head or valve box. This procedure will help eliminate damage to existing or future tree roots.

3.06 PLANT INSTALLATION

A. All concrete work, sprinkling systems, and finished grading shall be completed and approved by the Landscape Architect or Owner's Representative before any planting of the specified plant materials is begun.

B. No tree planting shall be initiated until sprinkling system is complete and tested. However, tree planting shall precede lawn planting.

C. Each plant will be placed in an individual plant pit. The sharing of pits shall not be allowed.

D. All trees and shrubs shall be planted in pits as detailed in the planting details contained herein or as noted on the drawings. Tree and shrub pits shall be circular in outline, with a diameter at least two (2) times the diameter of the rootball of each plant to be installed. They shall be one to two and one half (1 - 2 ½) inches shallower than the rootball depth. When the plant is properly placed in the plant pit, the root collar shall be approximately one (1) inch above finished grade of the topsoil. For perennial plants (which have no root collar), the top of the rootball shall be even with the finished grade or the topsoil. The sides of the plant pit shall be roughened, and not smooth or sculpted.

E. Plant backfill mix shall be one hundred (100) percent topsoil.

F. For container grown plants, remove the container and place the plant vertically in the plant pit, directly on undisturbed soil. The root crown or collar shall be at or just above the finished grade. Perennial and ornamental grass plants shall be planted with the root collar at finished grade.

G. For balled and burlapped plants, place the plant vertically in the center of the pit, with the rootball resting on undisturbed soil. Cut and remove the wire basket and burlap or other wrapping material from the rootball. This may be done with the rootball in the pit. Any burlap or wire pieces underneath the rootball may be left in place if they cannot be removed. Do not fold the burlap over but cut away as much as possible without disturbing the rootball. No burlap shall be pulled from under the rootball. Backfill the bottom one third (1/3) of the pit as the wire and burlap are removed. In all cases, maintain the integrity of the rootball.

H. Specified backfill material shall be carefully and firmly worked and tamped under and around the rootball to fill all voids. When backfilled and compacted to two thirds (2/3) the depth of the pit, thoroughly water with a hose to completely soak the roots and remove

any air pockets.

I. The plant pit shall then be completely backfilled with the specified backfill mix and tamped well. A shallow watering basin or rain cup shall be formed around each plant. This basin will be equal in diameter to that of the original planting pit.

J. Monitor all plants to ensure that no settling occurs. Pits which settle shall be immediately filled with additional soil mixture at no additional expense to the Owner.

K. After planting, the following operations shall be performed:
   1. Stake and mulch all trees per installation details.
   2. Remove all nursery stakes ties, and tags from all plants. Prune and remove any dead, damaged, or broken branches. Maintain side growth on all trees.

3.07 STAKING

A. All trees, including evergreen trees, shall be staked.

B. Staking shall be performed as follows:
   1. Two (2) 2"x 2" square or 2" diameter round wood stakes, ten (10) feet in length, shall be used to support each tree planted under this contract unless otherwise indicated.
   2. Tree ties shall conform to the staking detail shown on the planting detail sheet.
   3. Each stake will be located adjacent to the rootball, on opposing sides, to provide maximum support to the trunk. Do not penetrate the rootball with the stake.
   4. The stakes will be driven into the pit bottom after the tree has been placed in the pit, but before backfilling begins so as to avoid damage to the roots.

C. Stakes and ties shall be removed after one (1) full growing season from the time the tree was installed.

3.08 WATERING

A. All plants shall be thoroughly watered immediately after planting. This shall mean full and thorough saturation of all backfill in the pits and beds during the same day of planting. Water shall be applied only by open end hose at very low pressure to avoid creating air pockets, causing injury to the plant, or washing away of backfill. When installed, watered, and fully settled, the plants shall be vertical with the root collar at the appropriate level.

B. Subsequent watering shall be provided by the site's irrigation system. The Contractor shall insure that all plants, especially trees, receive sufficient water to maintain healthy growth and vigor. Overwatering shall be avoided, and prolonged saturation of the soil around the trees shall be eliminated by appropriately controlling the irrigation circuit which provides water to that area.

3.09 WEED BARRIER FABRIC (if specified)

A. Prepare final grade prior to placing fabric. Placement of fabric shall comply with the following:
   1. Place pre-emergent herbicide prior to installing fabric.
   2. Install fabric directly on topsoil. With drip tubing, install tubing on top of fabric.
   3. Overlap and secure per manufacturer's recommendations.
   4. Cut an "X" where plant will be located. Peel back corners to allow plant installation. Fold corners back in to place after plant is installed.

3.10 MULCHING

A. Mulch shall be placed to a depth of three (3) inches minimum on top of the topsoil in all planting beds and over tree planting pits.

B. The finished grade of the mulch shall be as follows:
   1. One (1) inch below the surface or finished grade of any paving, mowstrips, or walks adjacent to the planting area.
   2. At adjacent finished grade of the turf surrounding tree planting pits.

C. In tree pits, the mulch shall be kept six (6) inches away from the base of the tree.

D. Just prior to placement of the mulch, the Contractor shall treat the mulched areas with a pre-emergent herbicide according to the manufacturer's recommendations.

3.11 MOWSTRIP

A. Form the concrete mowstrip using typical concrete forming methods. Ensure concrete

depth as specified in the plans and details. Concrete forms shall be uniform in width and follow the curves and tangents as shown in the plans. Locate border line edging with string or other means to assure border straightness and curves as designed.

B. Finish concrete with a medium broom finish and tool the edges for a neat, rounded edge to prevent chipping and spalling.

C. Place the rebar continuously in the center of the mowstrip. Overlap joints a minimum of twelve (12) inches.

3.12 METAL EDGING

A. Pre-manufactured metal edging:

1. Preparation: Ensure all underground utility lines are located and will not interfere with the proposed edging installation before beginning work. Locate border line edging with string or other means to assure border straightness and curves as designed. Dig trench one inch (1") deeper than the set of edging bottom.
2. Set edging into trench with top at the correct height above the topsoil with the mulch depths calculated into the total depth. When placed metal edging should be one-half inch (½") above the finished grade of the surrounding material. Drive stakes through edging loops until locked into place (or other means dictated by manufacturer). Place stakes at spacing specified by manufacturer. Ensure stakes are installed with freeze thaw cycles in mind and place stakes into compacted (not loose) soil.
3. Where edging sections turn at corners follow manufacturer's recommendations for bending, cutting, or ordering preformed corners as provided by manufacturer.
4. Backfilling and Cleanup: Backfill both sides of edging, confirm and adjust if necessary that sections are securely held together, and compact backfill material along edging to provide top of edging at one-half inch (½") above finished grade. Cleanup and remove excess material from the site.

3.13 SOD INSTALLATION

A. The Contractor shall notify the Landscape Architect or Owner's Representative of the source of the sod prior to placement.

B. The sod shall be free of grassy and broad-leaf weeds, contain no bare or burned spots, and be clean and strongly rooted. It shall be of the varieties noted on the plans and plant materials schedule.

C. The sod shall be cut using approved methods and equipment. It shall be cut in pieces not exceeding one (1) square yard, with a uniform thickness on all pieces. Sod thickness may vary between a minimum of one (1) inch and maximum one and one half (1 ½) inches but must be consistent throughout this project. For very large turf areas and all athletic fields, large rolls of sod shall be used. Sod shall be placed using equipment specifically designed to lay large sod rolls.

D. The Contractor shall notify the Landscape Architect of the source of the sod prior to placement. The sod shall be stripped and delivered to the site not more than twenty-four (24) hours prior to laying. The sod shall be maintained in a moist and healthy condition to encourage immediate growth.

E. The following procedure shall be followed when installing the sod:

1. Lay the sod on smooth, moist topsoil, working off planks if required.
2. Rake the topsoil to loosen and level prior to placing each course of sod.
3. Lay strips perpendicular to the direction of the slope. Strips shall be parallel to each other, with their end seams staggered. The sod shall be neither stretched nor overlapped, and all joints shall be butted tightly together.
4. Roll the sod immediately after placing and thoroughly water with a fine spray to a depth sufficient that the underside of the new sod and the soil immediately below the sod are thoroughly wet.
5. On slopes two (2) horizontal to one (1) vertical or steeper, lay the sod perpendicular to the slope and secure every row with wooden pegs at two (2) feet maximum on center. Drive the pegs flush with the soil portion of the sod.
6. Sod pieces shall be laid tightly together. Sod areas with gaps caused by pieces not being laid tightly enough together or with ridges from overlapping pieces shall not be accepted and the Contractor will be required to re-lay the sod.

3.14 HYDROSEEDING (NOT USED)

A. General:

1. Wood fiber mulch shall be virgin wood fiber, free of growth- or germination-inhibiting substances. The mulch shall be air dried with not more than fifteen (15) percent moisture by weight. The total organic weight shall be a minimum of ninety-eight (98) percent. Inorganic ash content shall be 0.7±0.2 percent. Water holding capacity shall be 1000G/100G (oven dried weight). The pH range shall be 4.0 - 6.0. The fiber length shall meet the following:
   a. Fifty (50) percent shall be at least 0.15 inches in length or longer.
   b. Fifty (50) percent shall be retained on the twenty-eight (28) mesh screen. It shall be Echofiber or Conwed or approved equal.
2. The seed mix shall be as specified on the plans. Provide written certification that the seed conforms to Utah seed law and is in compliance with Utah State Department of Agriculture regulations.
3. The tackifier shall be M-Binder or Plantego or equal.
4. The fertilizer shall be a chemically prepared, dry, homogenous pellet product with a balanced formula of 16-16-16.
5. Application rates shall be as follows:
   a. Wood fiber mulch ..... 50 pounds (min.)/1,000 SF
   b. Seed mix ..... See plans (7 pounds/1,000 SF typ.)
   c. Tackifier ..... 100 pounds/Acre
   d. Fertilizer ..... 1 pound or actual nitorgen/1,000 SF
   e. Water ..... 92 gallons/1,000 SF

B. One-step preparation and application of hydroseed mulch shall be as follows:

1. The wood fiber mulch, seed, tackifier, fertilizer, and water shall be mixed together in a hydroseeding machine having a capacity of at least two thousand (2,000) gallons to allow for a homogeneous slurry which is thoroughly mixed and can be applied easily without clogging. The machine shall be mounted on a traveling unit which is either self-propelled or drawn by a separate unit. Equipment used in the hydroseeding process shall be thoroughly cleaned of all seed and other materials used in any previous hydroseeding process, prior to hydroseeding on this project.
2. The equipment shall have a built in agitation system and operating capacity sufficient to agitate, suspend, and homogeneously mix a slurry containing not less than fifty (50) pounds of organic mulching amendment plus chemical additives and solids for each one hundred (100) gallons of water.
3. The slurry shall be prepared at the site and its components shall be mixed to supply the rates of application as specified. The slurry preparation shall begin by adding water to the tank when the engine is at one half (½) throttle. The engine throttle shall be open to full speed when the tank is one half (½) filled with water. All organic amendments, fiber, and chemicals shall then be added by the time the tank is two thirds (2/3) to three fourths (3/4) full. At this time and not before, the seed mix shall also be added. Spraying shall commence immediately when the tank is full, and the slurry is mixed.
4. Apply the hydroseed to form even appearing cover over the required areas. The slurry shall be applied in a downward drilling motion via a fan stream nozzle. It is important to ensure that all of the components enter and mix with the soil. Use only qualified and trained personnel to insure uniformity of the hydroseed applications.
5. The hydroseeding slurry components shall not be left in the hydroseed machine for more than two (2) hours in order to avoid seed deterioration.

C. A two-step hydroseeding procedure may be used in lieu of the one-step method. The two-step procedure shall consist of first sowing the seed mix by broadcasting, and second, applying the hydromulch. Specifically, this procedure shall conform to the following:

1. The seed shall be broadcast over the planting bed at the rates noted in the plant schedule. The seed shall be sown in two (2) perpendicular directions with a cyclone seeder or other similar mechanical seeder. Lightly rake the seed into the soil.

2. Apply a fine spray watering immediately after each area has been sown.
3. Prepare and apply hydromulch slurry (minus the seed mix) according to the procedure outlined in 3.12 B, steps 1 through 5 above.

3.15 DRILL SEEDING (NOT USED)

If seeding operations are to be done using a drill seeding method, the following requirements shall apply:

A. All topsoil shall be placed, and the fine grading completed prior to any seeding operations.

B. The seed bed shall be prepared by loosening the surface of the soil and mixing the specified fertilizer into the top two (2) inches of the topsoil. The finished surface shall be smooth and even, with no high or low spots, no rocks, nor other deleterious materials. The use of a Rotodairon or similar piece of equipment to prepare the seed bed is encouraged.

C. The seed shall be drilled using a Brillion type seeder, specifically designed for drilling grass seed. An agricultural grain drill is not acceptable. A cultipacker, harrow, or similar apparatus shall be a part of the seeder or dragged behind to help ensure that the seed is covered by the soil and the surface is left smooth and even.

3.16 CLEAN UP

A. Throughout the course of planting, excess and waste materials as well as excavated subsoil shall be continuously and promptly removed. All areas shall be kept clear and all reasonable precautions taken to avoid damage to existing structures, plants, and grass.

B. When planting has been completed in an area, it shall be thoroughly cleaned of all debris, rubbish, subsoil, and waste materials. These shall be removed from the property and disposed of legally. All planting tools shall also be put away.

C. The ground surface shall be left in a condition satisfactory to the Landscape Architect or Owner's Representative.

3.17 AS-BUILT DOCUMENTS

A. The Contractor shall keep a record of all departures from the working drawings that occur during construction. These changes shall be shown on a clean set of prints, and the prints kept on the job site at all times for review.

B. As a part of his observation work, the Landscape Architect or Owner's Representative shall review the as-built drawings regularly to verify that changes are being recorded. At the conclusion of the work, the Contractor shall present to the Owner fresh, clean drawings of all the changes made and recorded previously and they shall become part of the permanent record of the project.

3.18 MAINTENANCE

A. Substantial Completion:

1. At Substantial Completion of all planting work outlined in these plans, the Contractor shall contact the City to arrange for a walk through to verify that all aspects of the work have been completed. Work must be fully completed (except for final clean-up) according to all plans, notes, and specifications and exhibit professional workmanship. Substantial completion shall be defined as the complete installation of all plant materials, staking, mulching, and other work on the project in its entirety. Substantial completion shall not be given on designated portions of the project.
2. Notice by the Contractor shall be given, in writing, at least three (3) days in advance to the Landscape Architect or Owner's Representative so that proper scheduling can be made for those who are to attend.
3. At the appointed time, an inspection of all plant materials, including staking and mulching, shall be made.
4. A list of uncompleted items (punch list) shall be generated by the Landscape Architect or Owner's Representative and distributed to the Contractor and other involved parties within three (3) days of the substantial completion inspection. Each item on the punch list shall be corrected before the project will be approved and accepted by the Landscape Architect or Owner's Representative. The

Contractor will be back charged for time spent by the Owner and any consultants who have been brought to the site for a final inspection when the project is not ready for said inspection.

B. Maintenance/Establishment Period:
   1. The maintenance/establishment period shall begin one (1) day after the substantial completion inspection. The Contractor shall complete all punch list items during this period, as well as maintain and operate the entire irrigation system.
   2. In cases where the maintenance/establishment period runs beyond October 15 of any given year, the balance of the maintenance/establishment period days shall be extended into the spring of the following year. Counting of the balance of days shall begin no sooner than April 15, unless mutually agreed upon by both the Contractor and the City prior to that date. Early counting shall be based on weather conditions at the time.
   3. The Contractor shall maintain all plantings until the turf is fully established. The turf shall be considered fully established when grass stands come in uniform and thick, with no bare or thin spots, and roots have begun to spread and knit together. No weeds shall be allowed in the grass. If the turf grass is hydroseeded, the Contractor must complete the hydroseeding by September 1. The maintenance/establishment period shall be a minimum period of sixty (60) days.
   4. The maintenance work required shall include but not be limited to the following:
      a. Appropriate watering of all plant materials.
      b. Weeding and removal of all weeds from groundcover and planting areas.
      c. Replacement of any dead, dying, or damaged trees, shrubs, perennials, or groundcover.
      d. Filling and replanting of any low areas which may cause standing water.
      e. Adjusting or sprinkler head heights and watering patterns.
      f. Filling and recompaction of eroded areas, along with any required reseeding and/or replanting.
      g. The grass shall be mowed when the blades reach three (3) inches tall and maintained to a minimum height of two (2) inches. No more than one third (1/3) of the blade shall be removed per cutting. The cutting frequency shall be once every five (5) to seven (7) days depending upon grass height and growth rate.
      h. Weekly removal of all trash, litter, clippings, and all foreign debris.
      i. At thirty (30) days after planting, a balanced fertilizer (16-16-16) shall be applied to the grass areas at a rate of one half (½) pound of nitrogen per one thousand (1,000) square feet.
      j. At intervals of thirty (30) days after the first application of fertilizer to the grass, apply a balanced fertilizer (16-16-16) at a rate of one half (½) pound of nitrogen per one thousand (1,000) square feet until the grass is established.
   5. The maintenance period shall not end until Final Acceptance of the project.

C. Final Acceptance:
   1. A final inspection shall be held prior to the end of the maintenance period to ensure that all punch list items have been completed and the entire project is ready for acceptance by the Owner.
   2. Upon satisfaction that the Contractor has completed all punch list items, the irrigation system is fully and completely functional, and the required As-Built drawings, mylars and maintenance manuals have been submitted, the Owner shall accept the project.
   3. An official letter of final acceptance shall be prepared and issued by the Owner to the Contractor, designer, and the Landscape Architect. Upon final acceptance of the project by the Landscape Architect or Owner's Representative, the Owner shall assume full responsibility for the project, and the guarantee period shall begin.

3.19 GUARANTEE

A. Upon final acceptance of the project as being properly installed, the Contractor shall guarantee the plant materials as follows:
   1. All shrubs and groundcovers shall be guaranteed by the Contractor as to growth and health for a period of sixty (60) days after completion of the maintenance

period and final acceptance.

2. All trees shall be guaranteed by the contractor to thrive and grow in an acceptable upright position for a period of one (1) year after completion of the maintenance period and final acceptance.

B. The Contractor shall, within fifteen (15) days after receiving written notification by the Landscape Architect or Owner's Representative, remove and replace all guaranteed plant materials which die or become unhealthy or appear to be in a badly impaired condition at any time during the guarantee period. Any plants that settle below or rise above the desired finished grade shall also be reset to the proper grade.

C. All replacements shall be plants of the same kind, size, and quality as originally specified in the "plant list" and they shall be furnished, planted, staked, and maintained as specified herein at no additional cost.

D. The Contractor will not be responsible for plants destroyed or lost due to occupancy of the project, vandalism on the part of others, or improper maintenance or lack thereof.

E. At the conclusion of the guarantee period and prior to final inspection of the plant materials by the Landscape Architect or Owner's Representative, the Contractor shall remove all tree stakes. This period of time shall be approximately 1 year after initial planting.

1. Stakes shall be removed by first cutting the ties securing the tree to stakes and secondly pulling stakes or guys out of the ground.
2. Stakes shall not be broken off above, at, or below ground levels but removed completely.

F. At the conclusion of the guarantee period a final inspection of all planting included in this contract shall be made by the Landscape Architect or Owner's Representative. At that time any plant found to be unhealthy, broken, damaged, or otherwise in an impaired condition shall be noted. Plants so noted shall be removed immediately from the site by the Contractor and replaced by him, as specified under this section, with plants of like kind and size in the manner previously specified for the original planting without extra compensation.

END OF SECTION

SECTION 33 4100

STORM DRAINAGE SYSTEM

PART 1 - GENERAL

1.01 REFERENCE STANDARDS

A. AASHTO M 252 - Standard Specification for Corrugated Polyethylene Drainage Pipe; 2018.
B. AASHTO M 294 - Standard Specification for Corrugated Polyethylene Pipe, 300- to 1500-MM (12- to 60-in.) Diameter; 2018.
C. ASME B31.9 - Building Services Piping; 2020.
D. ASTM A536 - Standard Specification for Ductile Iron Castings; 1984 (Reapproved 2014).
E. ASTM C913 - Standard Specification for Precast Concrete Water and Wastewater Structures; 2021.
F. ASTM C990 - Standard Specification for Joints for Concrete Pipe, Manholes, and Precast Box Sections Using Preformed Flexible Joint Sealants; 2009 (Reapproved 2019).
G. ASTM D3035 - Standard Specification for Polyethylene (PE) Plastic Pipe (DR-PR) Based on Controlled Outside Diameter; 2022.
H. ASTM F477 - Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe; 2014 (Reapproved 2021).

1.02 1.1 SUMMARY

A. The extent of work is indicated on the Drawings and includes the following:
   1. New Cleanout Boxes and inlets and Piping.
B. The work includes but is not limited to:
   1. Perform trenching and backfilling required for work of this Section.

1.03 1.2 RELATED SECTIONS

A. Procedures and quality of excavating, backfilling, and compacting are specified in Division 31 Section “Earthwork”.
B. Concrete requirements related to this work are specified in Division 32 Section “Site Concrete.”

1.04 1.3 QUALITY ASSURANCE

A. Manufacturer Qualifications: Firms regularly engaged in manufacturing of products of types, materials, and sizes required, whose products have been in satisfactory use in similar service for not less than 5 years. Products are limited to those of domestic manufacturers.
B. Installer Qualifications: Firm with at least 3 years of successful installation experience on projects of similar scope.
C. Codes and Standards: Comply with all applicable codes and requirements, including amendments and modifications by local jurisdictions, related to the performance of this work including, but not necessarily limited to the following:
   1. International Building Code
   2. International Plumbing Code
   3. International Mechanical Code
   4. American National Standards Institute (ANSI)
   5. American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE)
   6. Welding: Qualify Welding procedures, welders, and operators in accordance with ASME b31.1, or ASME B31.9 or ANSI and ASTM as applicable, for shp and project site welding of piping work.
   7. Utah Safety Standards (OSHA), Utah State Industrial Council

1.05 1.4 SUBMITTALS

A. Product Data: Submit manufacturers' technical data and installation instructions for each type of material precast items and product furnished.
B. Record Drawings: At project closeout, submit Record Drawings of installed utility service lines in accordance with Division 1 Requirements.

1.06 1.5 PROJECT CONDITIONS

A. A. Interruption of Existing Storm Drainage Service: Do not interrupt service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary service according to requirements indicated:
   1. 1. Notify Owner and Architect no fewer than two days in advance of proposed interruption of service.
   2. 2. Do not proceed with interruption of service without Construction Manager's written permission.

PART 2 - PRODUCTS

2.01 2.1 STORM DRAINAGE SYSTEM COMPONENTS

A. A. For pipe 12" diameter or larger HDPE, Corrugated PE Pipe and Fittings AASHTO M 294, Type S, with smooth waterway for coupling joints.
B. -Watertight Joints: Watertight joints in accordance with ASTM D 3212 and AASHTO M 252. Bell and spigot with gaskets, ASTM F477.
C. B. For pipe 8" diameter or smaller, PVC Pipe: ASTM D3035 SDR 35, with bell and spigot type joints and elastomeric seals.
D. C. All piping within the City ROW per City Std.

2.02 2.2 CATCH BASIN/CLEANOUT BOXES

1. PIPE CONNECTORS: ASTM C 923, RESILIENT, OF SIZE REQUIRED, FOR EACH PIPE CONNECTING TO BASE SECTION.

A. A. Designated Precast Concrete Catch Basins: ASTM C913, precast, reinforced concrete; designed according to ASTM c 890 for A-16, heavy-traffic, structural loading; of depth, shape, and dimensions indicated, with provision for sealant joints.
   1. 1. Joint Sealants: ASTM C990, bitumen or butyl rubber.
   2. 2. Grade Rings: Include 2 or 3 reinforced-concrete rings, of 6- to 9-inch total thickness, that match 24-inch-diameter frame and grate.
   3. 3. Pipe Connectors: ASTM C 923, resilient, of size required, for each pipe connecting to base section.
B. B. Cast-in-Place Concrete, catch Basins: Construct of reinforced concrete; designed according to ASTM C 890 for structural loading; of depth, shape, dimensions, and appurtenances indicated.
   1. 1. Bottom Walls, and Top: Reinforced concrete.
   2. 2. Channels and Benches: Concrete.
C. C. Frames and Grates: ASTM A536, Grade 60-40-18, ductile iron designed for A16. Structural loading. Include flat grate with small square or short-slotted drainage openings.
   1. 1. Size: 24 by 24 inches minimum, unless otherwise indicated.
   2. 2. Grate Free Area: Approximately 50 percent, unless otherwise indicated.

PART 3 - EXECUTION

4.01 3.1 GENERAL:

A. Excavate and backfill as specified in Section 312000.
B. Locate lines as close as possible to those shown on Drawings.
C. For sloped lines, grade to obtain fall required.
D. Remove debris from trench prior to laying of pipe.
E. Do not cut trenches near footings without consulting Architect.
F. Backfill only after pipe lines have been inspected and approved by Architect.
G. Failure to install joints properly shall be cause for rejection and replacement of piping system.

4.02 3.2 INSTALLATION OF STORM DRAINAGE SYSTEM

A. General: Backfill only after pipe lines have been inspected and approved by Architect.
B. Install cleanout boxes to grade as indicated on plans. Provide concrete collar around new and existing boxes. Use 4,000 psi concrete collars around inlets and cleanout boxes to grade.
C. Install materials in accordance with Manufacturer's instructions.
D. Grout smooth with non-shrink grout all inlet box joints, piping connections or ledges.

4.03 3.3 FIELD QUALITY CONTROL

A. A. Inspect interior of piping to determine whether line displacement or other damage has occurred. Inspect after approximately 24 inches of backfill is in place, and again at completion of Project.
    1. 1. Submit separate reports for each system inspection.
    2. 2. Defects requiring correction include the following:
        a. a. Alignment: Less than full diameter of inside of pipe is visible between structures.
        b. b. Deflection: Flexible piping with deflection that prevents passage of ball or cylinder of size not less than 92.5 percent of piping diameter.
        c. c. Crushed, broken, cracked, or otherwise damaged piping.
        d. d. Infiltration: Water leakage into piping.
        e. e. Exfiltration: Water leakage from or around piping.
    3. 3. Replace defective piping using new materials, and repeat inspections until defects are within allowances specified.
    4. 4. Reinspect and repeat procedure until results are satisfactory.
B. B. Test new piping systems, and parts of existing systems that have been altered, extended, or repaired, for leaks and defects.
    1. 1. Do not enclose, cover, or put into service before inspection and approval.
    2. 2. Test completed piping systems according to authorities having jurisdiction.
    3. 3. Schedule tests and inspections by authorities having jurisdiction with at least 24 hours advance notice.
    4. 4. Submit separate report for each test.
C. C. Leaks and loss in test pressure constitute defects that must be repaired.
    1. Replace leaking piping using new materials, and repeat testing until leakage is within allowances specified.

4.04 3.4 CLEANING

A. A. Clean interior of piping and storm drain boxes of dirt and superfluous materials.

END OF SECTION 33 4100