

PROJECT MANUAL

FOR



Nibley Middle School

Bid Package #2

Volume 1

Divisions 00 - 14

design west | architects

255 South 300 West

Logan, Utah 84321

435.752.7031

Architects Project # 123006

May 3, 2024

Cache County School District

**SECTION 00 0101
PROJECT TITLE PAGE**

PROJECT MANUAL

FOR

**123006 - CCSD NIBLEY MIDDLE SCHOOL
ARCHITECT'S PROJECT NUMBER: 123006**

CACHE COUNTY SCHOOL DISTRICT

**3050 S 920 W
NIBLEY, UTAH84318**

DATE: MAY 3, 2024

PREPARED BY:

DESIGN WEST ARCHITECTS

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**SECTION 00 0102
PROJECT INFORMATION**

PART 1 GENERAL

1.01 PROJECT IDENTIFICATION

- A. Project Name: 123006 - CCSD Nibley Middle School, located at:
3050 S 920 W
Nibley, Utah 84318.
- B. The Owner, hereinafter referred to as Owner: Cache County School District
- C. Owner's Project Manager: Bruce Parker.
 - 1. Department: Cache County School District.
 - 2. Address: 84 East 2400 North.
 - 3. City, State, Zip: North Logan, UT 84341.
 - 4. Phone/Fax: (435) 752-3925.

1.02 NOTICE TO PROSPECTIVE BIDDERS

- A. These documents constitute an Invitation to Bid to and request for qualifications from Sub-Contractors for the construction of the project described below.

1.03 PROJECT DESCRIPTION

- A. Summary Project Description: A new middle school building will be built on a undeveloped lot..
- B. Contract Scope: New Construction on Vacant Site and Site Development.
- C. Contract Terms: Cost plus a fee, with a guaranteed maximum price (GMP).

1.04 PROJECT CONSULTANTS

- A. The Architect, hereinafter referred to as Architect:
 - 1. Address: 255 South 300 West.
 - 2. City, State, Zip: Logan, Utah 84321
 - 3. Phone: (435) 752-7031.

1.05 PROCUREMENT TIMETABLE

- A. Pre-Bid Site Tour: see 00 0104 Notice to Contractors None - N/A.
- B. Last Request for Substitution Due: 3 days prior to due date of bids.
- C. Last Request for Information Due: 3 days prior to due date of bids.
- D. Bid Opening: see 00 0104 Notice to Bidders, None - N/A.
- E. The Owner reserves the right to change the schedule or terminate the entire procurement process at any time.

1.06 PROCUREMENT DOCUMENTS

- A. Availability of Documents: Complete sets of procurement documents may be obtained:
- B. Documents are available thru DWA Construction.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION 00 0102

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**SECTION 00 0103
PROJECT DIRECTORY**

PART 1 GENERAL

1.01 SECTION INCLUDES

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

1.02 OWNER:

- A. Name: Cache County School District
 - 1. Address Line 1: 84 East 2400 North.
 - 2. City: North Logan.
 - 3. State: Utah.
 - 4. Zip Code: 84341.
 - 5. Telephone: (435) 752-3925.
- B. Primary Contact: All correspondence from the CMGC Contractor to the Architect will be direct, with copies to this party, unless alternate arrangements are mutually agreed upon at preconstruction meeting.
 - 1. Title: Facilities Manager.
 - 2. Name: Bruce Parker.
 - 3. Email: bruce.parker@ccsdut.org.

1.03 CONSULTANTS:

- A. Architect: Design Professional of Record. All correspondence from the CMGC Contractor regarding construction documents authored by Architect's consultants will be through this party, unless alternate arrangements are mutually agreed upon at preconstruction meeting.
 - 1. Company Name: Design West Architects.
 - a. Address Line 1: 255 South 300 West.
 - b. City: Logan.
 - c. State: Utah.
 - d. Zip Code: .
 - e. Telephone: (435) 752-7031.
 - 2. Primary Contact:
 - a. Title: Architect.
 - b. Name: Stephen Williams.
 - c. Email: stephenw@designwestarchitects.com.
- B. Interior Design Consultant:
 - 1. Company Name: Design West Architects.
 - a. Address: 255 South 300 West.
 - b. City: Logan.
 - c. State: Utah.
 - d. Zip Code: 84321.
 - e. Telephone: (435) 752-7031.
 - 2. Primary Contact:
 - a. Title: Interior Designer.
 - b. Name: Tyson Bekker.
 - c. Email: tysonb@designwestarchitects.com.
- C. Civil Engineering Consultant:
 - 1. Company Name: Cache Landmark.
 - a. Address: 95 Golf Course Rd #101
 - b. City: Logan.
 - c. State: Utah.
 - d. Zip Code: 84321.
 - e. Telephone: (435) 713-0099.
 - 2. Primary Contact:

- a. Title: Civil Engineer.
 - b. Name: Lance Anderson.
 - c. Email: lance@cachelandmark.com.
- D. Landscape Architecture Consultant:
- 1. Company Name: Design West Architects.
 - a. Address: 255 South 300 West.
 - b. City: Logan.
 - c. State: Utah.
 - d. Zip Code: 84321.
 - e. Telephone: (435) 752-7031.
 - 2. Primary Contact:
 - a. Title: Landscape Architect.
 - b. Name: Keni Althouse.
 - c. Email: kenia@designwestarchitects.com.
- E. Structural Engineering Consultant:
- 1. Company Name: ARW Engineers - Structural Consultants.
 - a. Address: 1594 Park Circle.
 - b. City: Ogden.
 - c. State: Utah.
 - d. Zip Code: 84404.
 - e. Telephone: (801) 782-6008.
 - 2. Primary Contact:
 - a. Title: Structural Engineer.
 - b. Name: Joshua Blazzard.
 - c. Email: joshb@arwengineers.com.
- F. Mechanical Engineering Consultant - Plumbing:
- 1. Company Name: VBFA.
 - a. Address: 40 W Cache Valley Blvd..
 - b. City: Logan.
 - c. State: Utah.
 - d. Zip Code: 84341.
 - e. Telephone: (801) 478-1087.
 - 2. Primary Contact:
 - a. Title: Mechanical Engineer.
 - b. Name: Jed Jenkins.
 - c. Email: jjenkins@vbfa.com.
- G. Mechanical Engineering Consultant - HVAC:
- 1. Company Name: VBFA.
 - a. Address: 40 W Cache Valley Blvd.
 - b. City: Logan.
 - c. State: Utah.
 - d. Zip Code: 84341.
 - e. Telephone: (801) 478-1087.
 - 2. Primary Contact:
 - a. Title: Mechanical Engineer.
 - b. Name: Jed Jenkins.
 - c. Email: jjenkins@vbfa.com.
- H. Electrical Engineering Consultant:
- 1. Company Name: Envision Engineering.
 - a. Address: 240 East Morris Ave #200.
 - b. City: Salt Lake City.
 - c. State: Utah.

- d. Zip Code: 84115.
- e. Telephone: (801) 534-1130.
- 2. Primary Contact:
 - a. Title: Electrical Engineer.
 - b. Name: Phil Borup.
 - c. Email: pborup@envisioneng.com.
- I. Kitchen Consultant:
 - 1. Company Name: W.S. Reich & Associates.
 - a. Address: 2846 South 4450 West.
 - b. City: Bountiful.
 - c. State: Utah.
 - d. Zip Code: 84010.
 - e. Telephone: (801) 295-4109.
 - 2. Primary Contact:
 - a. Name: Ed Reich.

1.04 CONSTRUCTION MANAGER/GENERAL CONTRACTOR:

- A. Company Name: DWA Construction.
 - 1. Address: 76 W 2400 N.
 - 2. City: Logan.
 - 3. State: Utah.
 - 4. Zip Code: 84341.
 - 5. Telephone: (801) 752-6860.
- B. Primary Contact:
 - 1. Title: Construction Manager.
 - 2. Name: Wayne Anderson.
 - 3. Email: wayne.a@dwaconstruct.com.
 - 4. Project Superintendent
 - 5. Name:
 - 6. Email:

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION 00 0103

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**SECTION 00 0110
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- O. 00 7300 - Supplementary Conditions
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- A. DC B - Shell Criteria - COMcheck

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- H. 01 4000 - Quality Requirements
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- C. 05 2100 - Steel Joist Framing
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- B. 08 1416 - Flush Wood Doors

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3.14 DIVISION 14 -- CONVEYING EQUIPMENT

- 14 2400 - Hydraulic Elevators

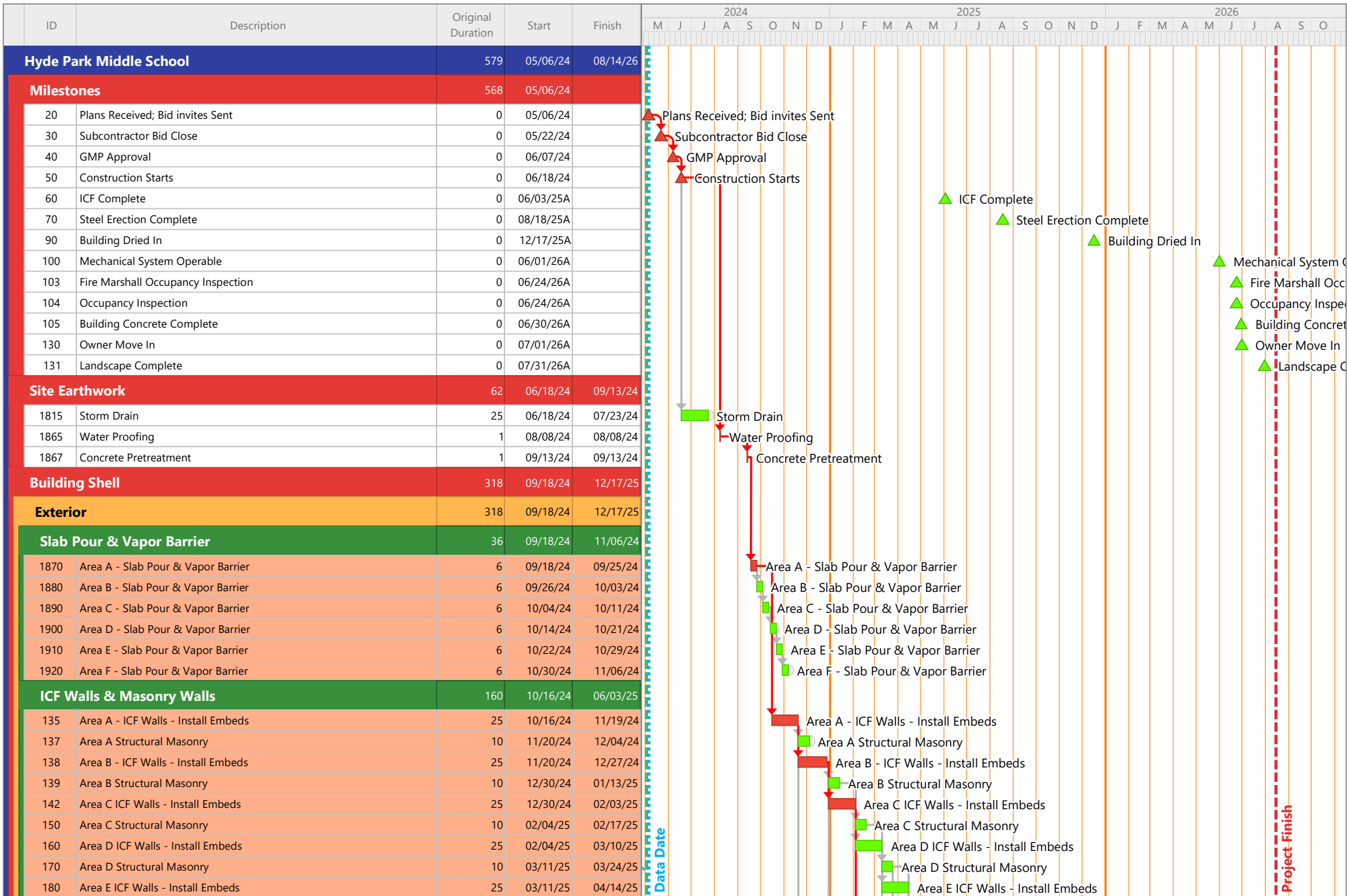
END OF SECTION 00 0110

**SECTION 00 0120
LIST OF SCHEDULES**

1.01 FRONT END SCHEDULE

- A. See the attached schedule

END OF SECTION 00 0120

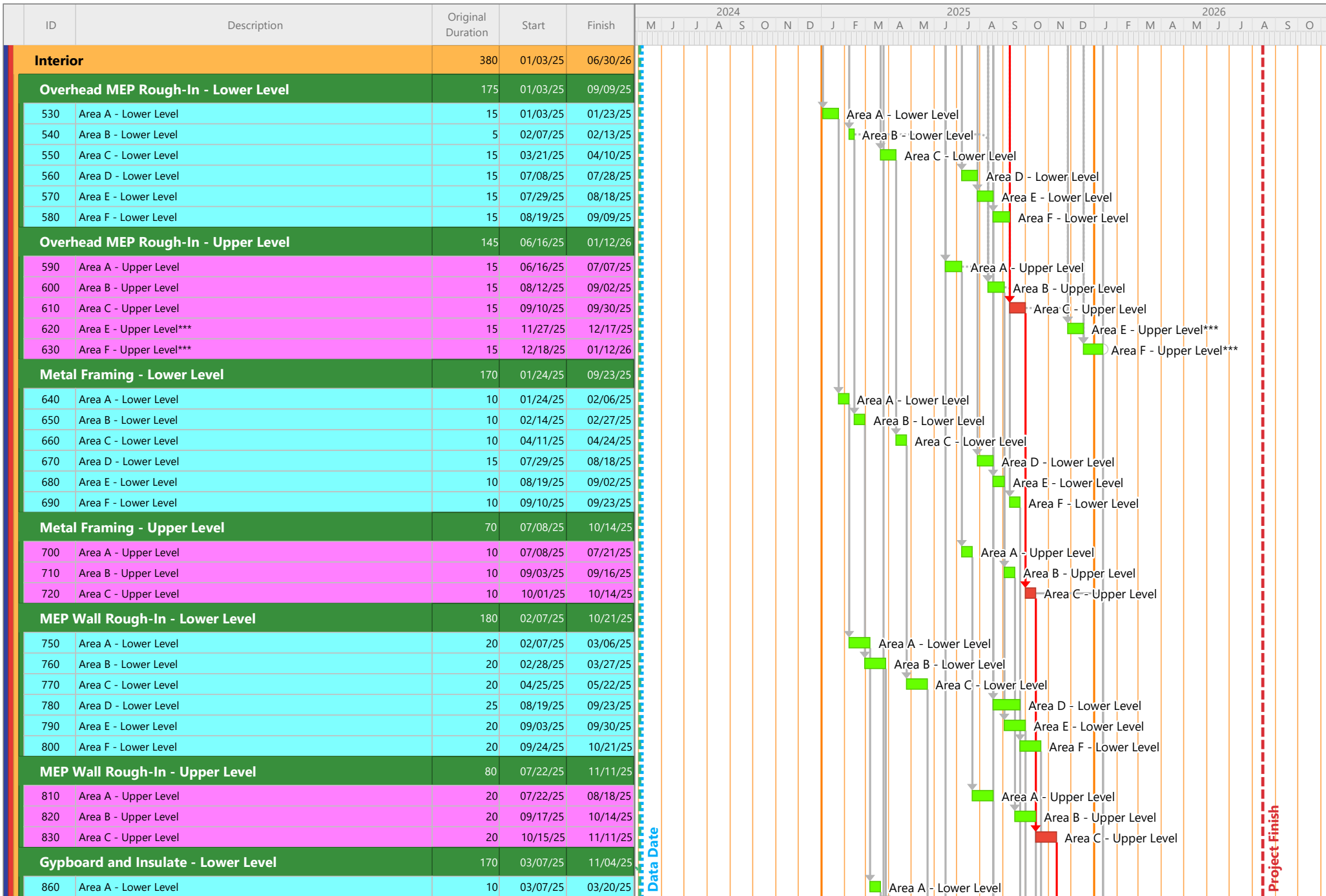


Start Date: 05/03/24
 Finish Date: 08/14/26
 Data Date: 05/06/24
 Run Date: 04/25/24
 HPMS Front End Schedule.ppx

Preliminary Schedule

Schedule is subject to change



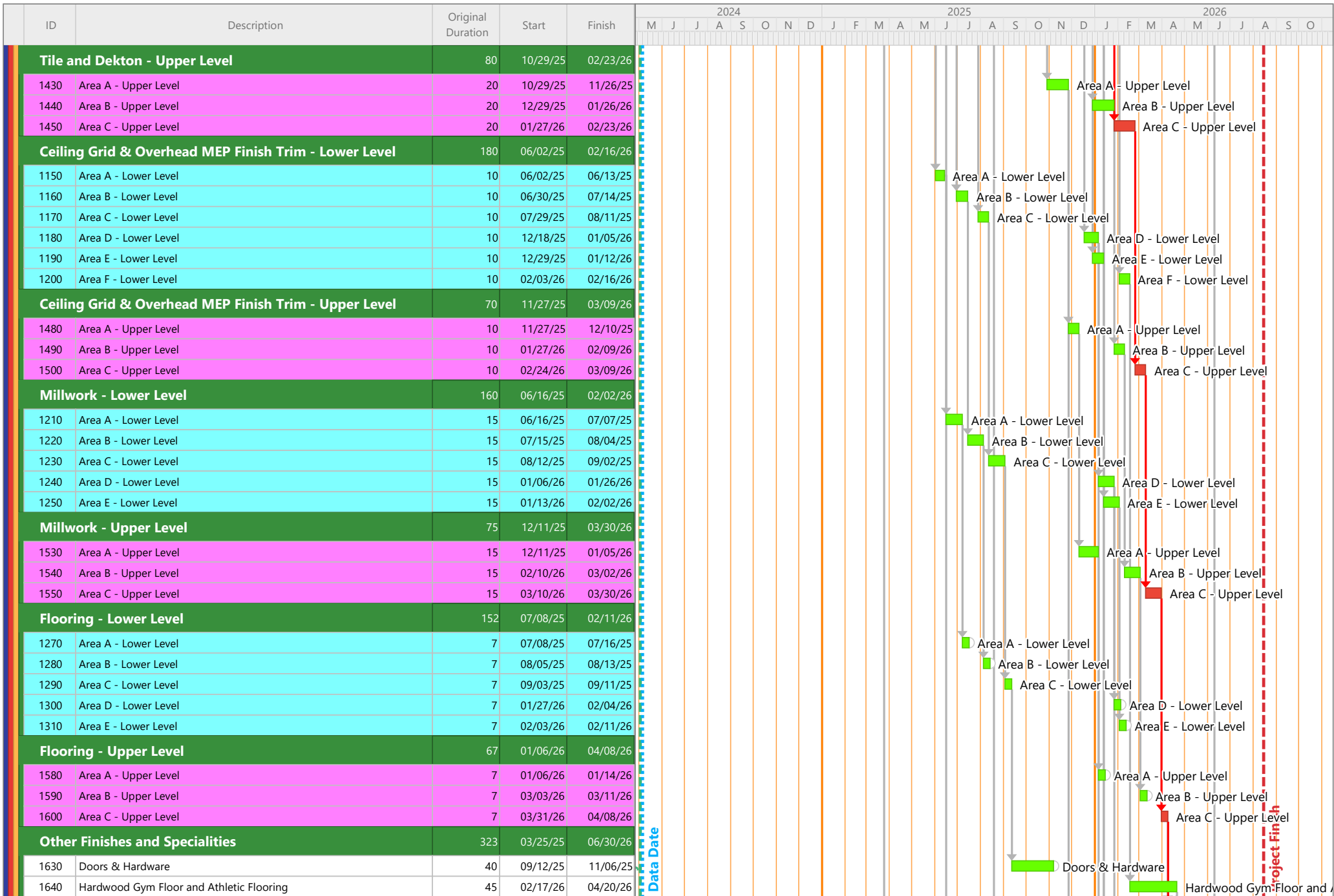


Start Date: 05/03/24
 Finish Date: 08/14/26
 Data Date: 05/06/24
 Run Date: 04/25/24
 HPMS Front End Schedule.ppx
 Page 3A

Preliminary Schedule

Schedule is subject to change





Start Date: 05/03/24
 Finish Date: 08/14/26
 Data Date: 05/06/24
 Run Date: 04/25/24
 HPMS Front End Schedule.ppx

Preliminary Schedule

Schedule is subject to change



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Cache County School District

**SECTION 00 1113
ADVERTISEMENT FOR BIDS**

SEE THE ATTACHED NOTICE TO BIDDERS

END OF SECTION 00 1113

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SECTION 00010 – ADVERTISEMENT FOR BIDS:

- PROJECT:** **CCSD Nibley and Hyde Park Middle Schools Site & Building Bid Package #2** for Cache County School District. The Nibley Middle School is located at 3050 S 920 W, Nibley, Utah 84321. The Hyde Park Middle School is located at 250 W 200 S, Hyde Park, UT 84318.
- DESCRIPTION:** Provide lump sum bids for divisions 01 1000 through 44 1000 for Construction phase as per Architectural drawings and specifications. This project will begin April 15, 2024, and will occur through July 3, 2026.
- TIME AND PLACE:** DWA Construction, Inc. will receive contractor and supplier bids for the project at their Corporate Office located at 76 West 2400 North P.O. Box 3448, Logan, Utah 84323 on May 28, 2024 @ 3:00 PM. Faxed or emailed bids will be accepted. Please email bids to dwanate.h@dwaconstruct.com.
- TYPE OF BID:** The package will be awarded using a low bid best Value selection process.
- PRE-BID MEETING:** No pre-bid meeting will be held.
- COMPLETION LIQUIDATED DAMAGE** Liquidated damages will be assessed in the amount of \$1,000.00 for each calendar day that the project is delayed based on the project schedule for each trade. Construction will begin April 15, 2024, and be completed by July 3, 2026.
- BIDDING DOCUMENTS:** Bidding documents will be available May 3, 2024, through the office of **DWA Construction, Inc.**, 76 West 2400 North P.O. Box 3448, Logan, Utah 84323 in accordance with the Instructions to Bidders. Bidders will be limited to one (1) set of documents. These sets **WILL NOT** be available to keep for the duration of the bidding. No partial sets of documents will be issued. Plans will also be available for viewing at our website www.dwaconstruct.com and the following plan rooms:
1. Builders Exchange Plan Rooms
Phone: 775-329-7222 utahplanroom.com
 2. DWA Construction, Inc.: 76 West 2400 North Logan, Utah 84341 Phone: (435) 752-6860 Fax (435) 752-7606
 3. Intermountain Contractor: www.construction.com/projectcenter/.
- PERFORMANCE AND PAYMENT:** Upon receipt of a contract exceeding **\$50,000.00**, the successful Contractor shall furnish to the Owner (*at the CM/Owner's option*) a 100 percent Performance and Payment Bond in accordance with the Instructions to Bidders.
- BID BONDS** Bid bonds will be required on all bids exceeding \$250,000.00.
- RIGHT TO REJECT BIDS:** DWA Construction, Inc. and the Owner reserves the right to reject any or all bids and to waive any irregularities in any bid or in the bidding.

END OF SECTION

**SECTION 00 3100
AVAILABLE PROJECT INFORMATION**

PART 1 GENERAL

1.01 EXISTING CONDITIONS

- A. Certain information relating to existing surface and subsurface conditions and structures is available to bidders but will not be part of Contract Documents, as follows:
- B. Geotechnical Report: Entitled Geotechnical Investigation for the proposed Nibley Middle School, dated December 11, 2023.
 - 1. Original copy is attached at the end of this section .
 - 2. This report identifies properties of below grade conditions and offers recommendations for the design of foundations, prepared primarily for the use of Architect.
 - 3. This report, by its nature, cannot reveal all conditions that exist on the site. Should subsurface conditions be found to vary substantially from this report, changes in the design and construction of foundations will be made, with resulting credits or expenditures to the Contract Price accruing to Owner.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION 00 3100

ACache Corp.

Engineering a Firm Foundation

Geotechnical Investigation
for the proposed
Hyde Park Jr. High School
To be located
at the approximate address of
300 South 200 West
Hyde Park, Utah

PREPARED FOR:
CACHE-LANDMARK ENGINEERING, INC.

Care of:

Lance Anderson
95 W Golf Crse Rd #101
Logan, Utah 84321

PREPARED BY:

ACache Corp.
PROJECT NO. 1220008

November 12, 2022

November 12, 2022

Attn. Lance Anderson
Cache-Landmark Engineering, Inc.
95 W Golf Crse Rd #101
Logan, Utah 84321

Subject: **Geotechnical Investigation for the proposed
NORTH LOGAN HIGH SCHOOL
To be located at approximately
300 South 200 West
Hyde Park, Utah**

ACache Corp. Project No. 1220008

Mr. Anderson

It is with great pleasure that ACache Corp. presents this report of our findings for the subject site. It contains the results of our findings and an engineering interpretation of the results with respect to the available project characteristics. Pavement recommendations

Soil samples were obtained during our investigation. Please note that we will store these samples for 30 days after the signed date on this report, at which time they will be discarded unless you request otherwise.

We appreciate the opportunity of working with you on this project and look forward to future projects with you. If you have questions regarding this project, or any other, please do not hesitate to contact us at **(435)-760-3103**.

Sincerely,

A Cache Corp.

Jay E. Apedaile, P.E. M.S.
President



ACache Corp.

Engineering a Firm Foundation

P.O. Box 393 • 89 South 100 East • Mendon, Utah 84325 • www.acachecorp.com
Tele. (435) 760-3103 • Fax (614) 883-9419 • email: acachecorp@yahoo.com

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Figure 2: Site Map

Figure 3: Symbol Legend

Figures 4-7: Borehole Logs

Figures 8-11: CPT Logs

1.0 GENERAL PROJECT INFORMATION

1.1 Project Authorization

A Cache Corp. (ACC) was retained by Lance Anderson of Cache-Landmark Engineering, Inc. to conduct a Geotechnical Subsurface Investigation for the proposed HYDE PARK JR. HIGH SCHOOL to be located at the approximate address of 300 South 200 West in Hyde Park, Utah (see **Figures 1 and 2** in the Appendix).

1.2 Project Purpose and Description

The purpose of this study was to obtain design level soil information to be used in the design of the proposed structures. Based on the information provided by Cache-Landmark, Inc. the proposed construction will consist of the development of approximately 13 acres for a school buildings, parking lots, playing field and access roads. The proposed school building is a slab on grade two story structure with high ceilinged gymnasiums. Structural loads are anticipated to consist of column loads ranging from 10 to 300 kips, and wall loads ranging from 2.0 to 18 kips per linear foot, for dead plus live loads. Final site grading information was not provided. ACC has assumed that the floor slab of the buildings will be placed at or above the current elevation of the site.

This report and the recommendations here in are based on the available project information. If this information is incorrect, then ACC shall be informed, preferably in writing, so ACC can evaluate the validity of this report.

2.0 SITE AND SUBSURFACE CONDITIONS

2.1 Site Investigation

The site is located in an open fielded area on the west side of 200 West and at 300 South in Hyde Park, Utah (see **Figures 1 and 2** in the Appendix).

The general subsurface conditions at the site of the proposed structures were investigated by pushing 4 Cone Penetrometer Tests (CPT) one of which seismic testing was conducted, to 50-feet or refusal and then drilling 4 boreholes ranging in depth from 12-feet to 17.5-feet below the current site grade. The approximate location of each explored location is shown on **Figure 2** in the Appendix. Soil samples were obtained at significant change of strata and in general accordance with ASTM D-420 and ASTM 2488. The subsurface conditions observed in the field investigation are discussed in Section 3.6 and in the Boring and CPT Logs.

Logs of the boreholes including a description of all soil strata encountered are presented in the Appendix as **Figures 4-7**. Sampling information and other pertinent data and observations are also included in the logs. A legend of the symbols used in the boring logs is presented in the Appendix as **Figure 3**. Logs of the CPT and seismic testing results are presented in the Appendix as **Figures 8-11**.

2.2 Laboratory Investigation

Samples obtained during the field investigation were returned to the laboratory and inspected and classified in accordance with the Unified Soil Classification System (ASTM 2487). Selected laboratory tests were performed on representative soil samples to determine their classification and characteristics with respect to engineering design. The following list indicates typical laboratory tests which may have been conducted on some of the samples retrieved from the site.

<u>Test</u>	<u>Standard</u>	<u>To Determine</u>
Moisture Content	ASTM D 2216	% moisture representative of field conditions
Atterberg Limits	ASTM D 4318	Plasticity and workability
% Pass #200 Sieve	ASTM D 1140	% fines in sample
Dry Density	ASTM D 2937	Dry unit weight representative of field conditions.

The testing results and the soil classifications are illustrated in the Logs contained in the Appendix (**Figures 4-7**).

3.0 FINDINGS

3.1 Site Conditions

At the time of this investigation the site consisted of open agricultural fields with a deep ditch crossing between them from east to west. The ditch had water running through it at the time of the investigation.

3.2 Surface Drainage

Currently, the majority of any surface runoff would drain to the west. The soil conditions appear to be adequate in keeping the surface soils from eroding.

3.3 Geology

The site was mapped by James McCalpin as being formed from lacustrine silt and clay related to the Provo and Bonneville shorelines. It consists of layers of clay, silt and minor fine sands, usually deposited in thick beds in deep and quiet water. The observed soil conditions were consistent to those anticipated on the map.

3.4 Soil Profile

The soil profile at the site was relatively consistent. Topsoil was observe with depths from 8" to as deep as 10" followed by a silty over consolidated clay with minor fine sand in lenses and some sand layers down approximately 20'. From 20' down to approximately 37' a softer slightly over consolidated sensitive clay was observed followed by siltier clays with some sand lensed down to approximately 48' where some dense sands were observed to the full depth investigated (~53').

For detailed observations of the sub-soils, the location they were observed, the characteristic observed, and any other pertinent information observed in the field or in the laboratory, see the Logs in the Appendix.

3.5 Fault and Seismicity

The site is located in a seismically active region. It is approximately 2.5-miles west of a mapped location of a section of the Utah East Cache Fault scarp, as depicted on the Surficial Geologic Map of the East Cache Fault Zone (James McCalpin, 1989). During the life of the project seismic activity caused by active faults in the area, have the potential of causing moderate to strong shaking. According to the findings of our subsurface investigation (seismic shear wave analysis), and according to the guidelines of the International Building Code (IBC, 2018), we recommend using a Site Class **E** (ASCE 7, Section 20) for the proposed structural design.

3.6 Liquefaction Evaluation

A site specific liquefaction assessment was conducted by obtaining CPT data, and SPT samples for laboratory analysis of the sub-soils to a depth of ~56-feet below the current site grade. Liquefaction potential analysis was conducted following the procedures by Seed and Idriss (1982), Seed, et. Al, (1983; 1985), and Youd and Idriss (1997), using Cone Penetrometer Tests (CPT) and laboratory results. **According to the analysis, the site soils have a very low susceptibility to liquefaction during a large seismic event.**

3.7 Ground Water

Ground water was observed in all of the borings at depths of 7 to 8-feet. It is likely that the groundwater fluctuates some during the year according to rainfall and other climatic and manmade (irrigation) influences. Artesian water pressures that would place water above the ground elevation were observed in the sand observed near 50-feet. It is evident however that ground water has been much deeper at some point in time given the observed desiccated clays. A detailed evaluation of the groundwater is beyond the scope of this investigation.

3.8 Site Subsurface Variations

It is our experience that variations in continuity and nature of subsurface conditions should be anticipated. Due to the nature and depositional characteristics of soils encountered at the site, care should be taken in interpolating or extrapolating subsurface conditions beyond the exploratory borings. Seasonal fluctuations in ground water conditions are likely to occur.

4.0 RECOMMENDATIONS

Recommendations have been developed on the basis of the previously described project characteristics and subsurface conditions observed in the field and laboratory, as well as common engineering practice. Prudence and common engineering practices should be followed in conjunction to the recommendations of this report.

4.1 Site Preparation and Grading

All topsoil, vegetation, unsuitable soils, fill, and any other deleterious materials, should be removed from areas of new construction. This material shall not be used as structural fill. After striping and excavation to the proper subgrade elevation, the exposed subgrade should be proof-rolled with a loaded tandem axle dump truck or similar rubber tired vehicle. Soils that rut, or tend to deflect excessively, should be removed and replaced with properly compacted fill. Proof rolling and removal of pumping material should be witnessed by the geotechnical engineer, or his approved representative. **For best results this should take place during a period of dry weather (May to September), as the observed silts and clays will likely be susceptible to pumping if the moisture content is increased.** The subgrade soils should be compacted to a minimum of 95 percent Modified Proctor maximum laboratory density (ASTM D 1557) at a moisture content ranging from - 2 to +5 percentage point of optimum.

Near the structures no more than 5-feet of soil should be added to the current site grade and effort should be exercised to minimize the extent of large areas of fill as it could induce long term settlement issues.

4.2 Foundation Recommendations for Buildings

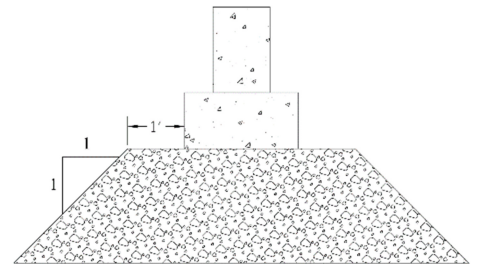
Conventional spot and continuous wall foundations may be used for the support of the proposed structure at the subject site. Based on field and laboratory data an **allowable bearing capacity** may be used for strip and spot foundations as follows:

Strip on native undisturbed 1500 psf.
Strip on 3 feet of structural fill 3000 psf.

Spot on native undisturbed 1500 psf.
Spot on 3 feet of structural fill 3500 psf.

provided the following recommendations are observed:

- Foundations shall be placed on native undisturbed or compacted soils or compacted structural fill (conforming to Sections 5.2 and 5.3).
- Onsite soils shall be examined by a qualified geotechnical engineer from this office, to verify that all topsoil, construction debris, soft spots, and any other deleterious materials have been removed prior to the placement of footings or structural fill.
- Structural fill shall be a well-graded granular soil, free of organics, debris, or other deleterious materials as outlined in Section 5.3.
- Structural fill shall be compacted as outlined in Section 5.3.
- Structural fill shall extend as a minimum 1-foot past the edge of the footing, and then for every 1-foot of fill (vertically) placed below the footing, it shall extend a minimum of 1-foot horizontally.
- Continuous footing width shall be maintained at a minimum of 18 inches.
- Spot footings shall be a minimum of 24 inches in width.
- Exterior footings shall be placed a minimum of 30 inches below final grade, and interior footing shall be placed a minimum of 16 inches below grade for frost protection.



Allowable bearing pressure may be increased by 1/3 for temporary loads such as wind or seismic forces. Foundations designed and constructed in accordance with our recommendations could experience some settlement. If the recommendations provided herein are observed, we estimate settlement should not exceed one inch, with differential settlements on the order of one-half inch. We anticipate approximately 75 percent of initial settlement to take place during construction.

4.3 Lateral Soil Pressures

Lateral soil pressures are dependent on the type of soil present. For the native silts and low plastic clay the following lateral soil pressures shall be used for design:

1. An equivalent fluid pressure of 48 pounds per cubic foot (pcf) for the active case. That is when the structure is allowed to yield, that is to say the structure is allowed to move away from the soil. This requires a minimum movement or rotation at the top of the wall of $0.001H$, where "H" is the height of the wall (bottom of footing to top of wall).
2. 68 pcf for the at-rest case. That is when the wall is not allowed to yield.
3. 298 pcf for the passive case. That is when the wall exerts pressure on the soil.
4. A coefficient of friction of 0.30 shall be used for the interface between the native silty clay and the cast-in-place concrete.

4.4 Drainage

For constructability, adequate surface drainage should be provided at the site to minimize any increase in moisture content of the foundation supporting soils during and after construction. Foundation soils shall be protected from any increase in moisture.

For final grade we recommend all areas around the structures be generously sloped to provide drainage away from these areas. We recommend a minimum slope of 6 inches in the first 10 feet away from the structure.

4.5 Floor Slabs

All topsoil and deleterious materials shall be removed (typically about 8 to 10-inches of topsoil at this site). We recommend a minimum of 6 inches of free draining structural fill, free from organic material and debris, be used just below floor slabs as a vapor barrier. If grade is required to be re-established or raised above current grade a structural fill shall be used and placed in accordance with Sections 5.2 and 5.3. **We recommend that this layer be connected to a drain system in multiple locations that would allow any water that could migrate from the aquifer would be drained away and not be allowed to puddle below the floor slab.**

5.0 GENERAL CONSTRUCTION CONSIDERATIONS

The guidelines and recommendations outlined below address the geotechnically related construction considerations for this project.

5.1 Foundation Excavations

All areas that will support foundation loads should be inspected by the geotechnical engineer, or his approved representative, to insure that all loose, soft, or otherwise undesirable material is removed, and that the structure will bear on satisfactory material. This shall occur prior to the placement of any structural fill or concrete. All topsoil shall be removed prior to the placement of foundations or pavements. (We recommend giving this office a few days notice for scheduling.) Any loose or deleterious material should be replaced with a structural fill as outlined in **Sections 5.2 and 5.3**. The existing irrigation ditch will have to be addressed, piped or diverted. Vegetation debris and soft spots will have to be removed and replaced with an approved structural fill.

If unsatisfactory material pockets are encountered in the excavation, the undesirable material should be removed, and the elevation re-established by backfilling. This backfilling can be done with a lean concrete, or a well-compacted structural fill as define in **Section 5.3**.

All structural fill supporting footing loads should be compacted to at least 95 percent of the Modified Proctor Maximum Density (ASTM D 1557), provided the foundation is designed as outlined in **Section 4.2**. Compaction tests should be taken on each lift to insure the required compaction is being achieved.

Foundation excavations shall be protected against any harmful change in condition such as disturbance, rain, and freezing. Surface runoff should be directed away from the excavation and not allowed to pond. Ideally all footing concrete should be poured the same day as the excavation is made. If this is not practical, the foundation excavation should be adequately protected, and foundation placement should take place as soon as possible. For best construction results we recommend that earth work be conducted during the dry months of the year, typically June through September.

Excavation slopes shall maintain a maximum slope of 2 horizontal to 1 vertical. It may be possible to have steeper slopes for temporary excavations. This will depend on the conditions location and precautions taken. Contact our office for further consultation. Otherwise if it is required that slopes are steeper, it is necessary that excavation shoring/bracing be used.

5.2 Fill Compaction

All fill material should be compacted in accordance to the following criteria based on the Modified Proctor Maximum Laboratory Density (ASTM D 1557):

- | | |
|---|-----|
| 1. Structural fill, supporting foundations. | 95% |
| 2. Structural fill, below floor slabs | 94% |
| 3. Backfill of trenches | |
| a. Below foundations | 95% |

b. Below floor slabs	94%
c. Below pavements	94%
d. Others	90%
4. Beneath Pavements	95%

Compaction should be accomplished by placing the fill in a maximum of 8-inch loose lifts, and mechanically compacting each lift to the specified minimum density. Field density tests should be performed on each lift as necessary to insure that compaction is being achieved. As a minimum 33% of all spot footings, and one test for every 50 lineal feet of continuous wall footings shall be tested for each lift.

5.3 Types of Fill

5.3.1 Structural Fill: Sub-base (pit-run)

Well-graded granular soils free of organics, debris, or other deleterious materials are recommended for use as structural fill at this site. We recommend a well-graded sandy gravel material with no less than 5%, and no more than 10% passing the #200 sieve, and no particles greater than 4 inches in maximum dimension. Structural fill shall be compacted at a moisture content ranging from -2 to +6 percentage point of optimum in accordance to the Modified Proctor Maximum Laboratory Density (ASTM D 1557).

5.3.2 Structural Fill: Roadbase

Granular soils free of organics or other deleterious materials and debris. We recommend a sand and fractured gravel material with between 5 and 12 percent passing the #200 sieve, and no particles greater than approximately 1 inch in maximum dimension.

5.3.3 Non-Structural Fill

On-site soils appear to be suitable for non-structural site grading and landscaping fill. All fill material shall be approved by the engineer prior to placement.

5.4 Quality Control

Our recommendations are based on the assumption that adequate quality control testing and observations will be conducted during construction to verify compliance. This may include but is not necessarily limited to the following:

5.4.1 Field observations

Observations during all phases of construction should occur. Observations such as site preparation, foundation excavation, structural fill placement, and concrete placement.

5.4.2 Fill Compaction

Compaction testing is required for all Structural supporting fill materials. Maximum Dry Density (Proctor-ASTM 1557) tests should be requested by the contractor immediately after delivery of any granular fill materials. The maximum density information should then be used for field density tests on each lift as necessary to insure that the required compaction is being achieved.

5.4.3 Concrete Quality

We recommend that freshly mixed concrete be tested in accordance with ASTM designations as follows:

- Slump, Temperature, Unit Weight, and Yield testing should be conducted on every delivery truck (ASTM C 138 and C 143).
- Entrained Air testing should also be conducted on every delivery truck for exposed concrete or concrete placed above the frost line (ASTM C 231).
- Test cylinders should be taken a minimum of every 50 cubic yards. Cylinder compressive strength tests should be conducted at 7 and 28 days from the placement date (ASTM C 31).

6.0 LIMITATIONS

The recommendations submitted in this report were based on evaluating the information obtained from CPT's, borings and site investigation, and the design details furnished by Cache-Landmark Engineering, Inc. for the proposed project. The borehole and CPT data reflects the subsurface condition only at the specific location at the particular time designated on the borehole logs. Soil and ground water conditions may differ from conditions encountered at the actual investigated location. The nature and extent of any variation in the data may not become evident until construction begins. If variations do appear, it may become necessary to re-evaluate the recommendations of this report after we have observed the variation. If ACache Corp. is not notified of changes to the project or variations of the soils, ACache Corp. will not be responsible for the impact of those changes on the project.

The Geotechnical Engineer warrants that the findings, recommendations, specification, or professional advice contained herein, have been made in accordance with generally accepted professional geotechnical engineering practices in the local area. No other warranties are implied or expressed.

Once the plans and specifications are more complete, the Geotechnical Engineer shall be retained and provided the opportunity to review the final design plans and specifications to check that our engineering recommendations have been properly incorporated into the design documents. At this time, it may be necessary to submit supplementary

recommendations. If ACache Corp. is not retained to perform these functions, ACache Corp. will not be responsible for the impact of those conditions on the project. This report has been prepared for the exclusive use of Cache-Landmark Engineering, Inc. for the specific use on the proposed HYDE PARK JR. HIGH SCHOOL to be located at 300 South 200 West in Hyde Park, Utah.

7.0 REFERENCES

ASTM, American Society for Testing and Materials 1997

IBC, International Building Code, 2018 Edition, International Conference of Building Officials, Whittier, CA.

Interior Geological Survey, "Surficial Geologic Map of the East Cache Fault Zone Cache County, Utah, James McCalpin 1989

Seed, H.B., and Idriss, I.M., 1982, "Ground motion and soil liquefaction during earthquakes", Earthquake Engineering Research Institute, Oakland, California, p. 135.

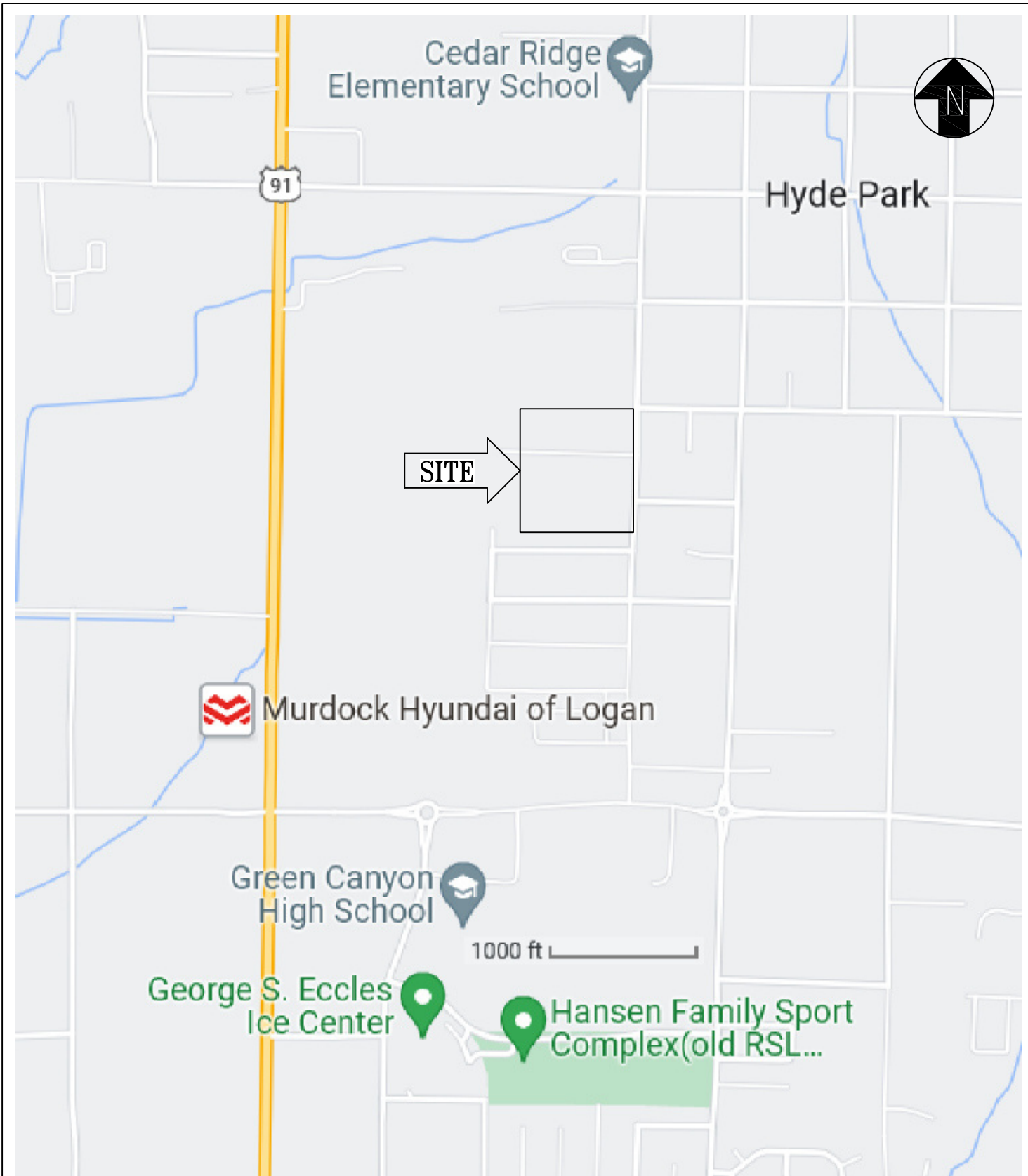
Seed, H.B., and Ibriss, I.M., and Arango, I., 1983, "Evaluation of Liquefaction Potential using field performance data", Journal of Geotechnical Engineering, Vol. 109, No.3, March, 1983, p. 458-483.

Seed, H.B., Tokimatsu, K., Harder, L.F., and Chung, R. M., 1985, "Influence of SPT procedures in soil liquefaction resistance evaluations", Journal of Geotechnical Engineering, Vol. 111, No.12, December, 1985, p. 1425-1445.

Tokimatsu, K., and Seed, H.B., 1987, "Evaluation of settlements in sand due to earthquake shaking", Journal of Geotechnical Engineering, Vol. 113, No.8, August, 1987, p. 861-878.

Youd, T.L., and Idriss, I.M., 1997, Summary report, proceedings of the NCEER workshop on evaluation resistance of soils, Edited by Youd, T.L., and Ibriss, I.M.: Technical Report NCEER-07-0022, December 31, 1997, p.40.

APPENDIX



Google 2022

A Cache Corp.

Engineering a Firm Foundation



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 email: acachecorp@yahoo.com

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Hyde Park Jr. High School

300 South 200 West, Hyde Park, Utah

TITLE: Vicinity Map

SCALE: No Scale

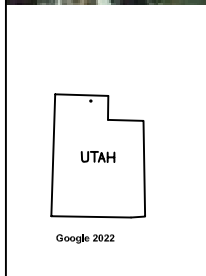
DATE: 11/11/2022

DRAWING NO. 1220008 Figures.dwg

ENGINEER:
J. Apedaile

DRAWN BY:
J. Apedaile

FIGURE 1



A Cache Corp.
 Engineering a Firm Foundation 

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Hyde Park Jr. High School
 300 South 200 West, Hyde Park, Utah

TITLE: Site Map		ENGINEER:	DRAWN BY:
SCALE: No Scale		J. Apedaile	J. Apedaile
DATE: 11/11/2022		FIGURE 2	
DRAWING NO. 1220008 Figures.dwg			

UNIFIED SOIL CLASSIFICATION SYSTEM

FIELD IDENTIFICATION PROCEDURES				GRAPH SYMBOL	LETTER SYMBOL	TYPICAL DESCRIPTIONS	
COARSE GRAINED SOILS More than half of material is larger than No. 200 sieve size. (The No. 200 sieve size is about the smallest particle visible to the naked eye)	GRAVELS More than half of coarse fraction is larger than No. 4 sieve size. (For visual classifications, the 1/4" size may be used as equivalent to the No. 4 sieve size.)	CLEAN GRAVELS (Little or no fines)	Wide range in grain size and substantial amounts of all intermediate particle sizes.		GW	Well graded gravels, gravel-sand mixtures, little or no fines.	
			Predominantly one size or a range of sizes with some intermediate sizes missing.		GP	Poorly graded gravels, gravel-sand mixtures, little or no fines.	
		GRAVELS WITH FINES (Appreciable amount of fines)	Non-plastic fines (for identification procedures see ML below).	GM	Silty gravels, poorly graded gravel-sand-silt mixtures.		
			Plastic fines (for identification procedures see CL below).	GC	Clayey gravels, poorly graded gravel-sand-clay mixtures.		
	SANDS More than half of coarse fraction is smaller than No. 4 sieve size. (For visual classifications, the 1/4" size may be used as equivalent to the No. 4 sieve size.)	CLEAN SANDS (Little or no fines)	Wide range in grain sizes and substantial amounts of all intermediate particle sizes.	SW	Well graded sands, gravelly sands, little or no fines.		
			Predominantly one size or a range of sizes with some intermediate sizes missing.	SP	Poorly graded sands, gravelly sands, little or no fines.		
		SANDS WITH FINES (Appreciable amount of fines)	Non-plastic fines (for identification procedures see ML below).	SM	Silty sands, poorly graded sand-silt mixtures.		
			Plastic fines (for identification procedures see CL below).	SC	Clayey sands, poorly graded sand-clay mixtures.		
FINE GRAINED SOILS More than half of material is smaller than No. 200 sieve size. (The No. 200 sieve size is about the smallest particle visible to the naked eye)	IDENTIFICATION PROCEDURES ON FRACTION SMALLER THAN No. 40 SIEVE SIZE						
	SILTS AND CLAYS Liquid limit less than 50	DRY STRENGTH (CRUSHING CHARACTERISTICS) PLATANCY (REACTION TO SHAKING) TOUGHNESS (CONSISTENCY NEAR PLASTIC LIMIT)	None to slight	Quick to slow	None	ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sand with slight plasticity.
			Medium to high	None to very slow	Medium	CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays.
			Slight to medium	Slow	Slight	OL	Organic silts and organic silt-clays of low plasticity.
	SILTS AND CLAYS Liquid limit greater than 50	DRY STRENGTH (CRUSHING CHARACTERISTICS) PLATANCY (REACTION TO SHAKING) TOUGHNESS (CONSISTENCY NEAR PLASTIC LIMIT)	Slight to medium	Slow to none	Slight to medium	MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts.
			High to very high	None	High	CH	Inorganic clays of high plasticity, fat clays.
			Medium to high	None to very slow	Slight to medium	OH	Organic clays of medium to high plasticity.
	HIGHLY ORGANIC SOILS		Readily identified by color, odor, spongy feel and frequently by fibrous texture.		Pt	Peat and other highly organic soils.	

Boundary classifications: - Soils possessing characteristics of two groups are designated by combinations of group symbols. For example GW-GC, well graded gravel-sand mixture with clay binder.
 All sieve sizes on this chart are U.S. standard.

GENERAL NOTES

- In general, Unified Soil Classification Designations presented on the logs were evaluated by visual methods only. There fore, actual designations (based on laboratory testing) may differ.
- Lines separating strata on the logs represent approximate boundaries only Actual transitions may be gradual.
- Logs represent general soil conditions observed at the point of exploration on the date indicated.
- No warranty is provided as to the continuity of soil conditions between individual sample locations.

LOG KEY SYMBOLS

Bulk / Bag Sample 2.0" O.D. Penetration Split Spoon Sampler 2.5" O.D. Penetration Split Spoon Sampler 3.0" O.D. Penetration Split Spoon Sampler Shelby Tube	Rock Core No Recovery Water Level (level after completion) Water Level (level where first encountered)
---	---

FINE - GRAINED SOIL	TORVANE POCKET PENETROMETER			FIELD TEST
	CONSISTENCY	SPT (blows/ft)	UNDRAINED SHEAR STRENGTH (tsf)	
Very Soft	<2	<0.125	<0.25	Easily penetrated several inches by Thumb. Squeezes through fingers. Easily penetrated 1" by Thumb. Molded by light finger pressure.
Soft	2 - 4	0.125 - 0.25	0.25 - 0.5	
Medium Stiff	4 - 8	0.25 - 0.5	0.5 - 1.0	Penetrated over 1/2" by Thumb with moderate effort. Molded by strong finger pressure. Indented about 1/2" by Thumb but penetrated only with great effort
Stiff	8 - 15	0.5 - 1.0	1.0 - 2.0	
Very Stiff	15 - 30	1.0 - 2.0	2.0 - 4.0	Readily indented by Thumbnail
Hard	>30	>2.0	>4.0	Indented with difficulty by Thumbnail

COARSE-GRAINED SOIL

APPERT DENSITY	SPT (blows/ft)	RELATIVE DENSITY (%)	FIELD TEST
Very Loose	<4	0 - 15	Easily penetrated with 1/2" reinforcing rod pushed by hand
Loose	4 - 10	15 - 35	Difficult to penetrated with 1/2" reinforcing rod pushed by hand
Medium Dense	10 - 30	35 - 65	Easily penetrated a foot with 1/2" reinforcing rod driven with 5-lb hammer
Dense	30 - 50	65 - 85	Difficult to penetrated a foot with 1/2" reinforcing rod driven with 5-lb hammer
Very Dense	>50	85 - 100	Penetrated only a few inches with 1/2" reinforcing rod driven with 5-lb hammer

STRATIFICATION

DESCRIPTION	THICKNESS
SEAM	1/16 - 1/2"
LAYER	1/2 - 12"
DESCRIPTION	THICKNESS
Occasional	One or less per foot of thickness
Frequent	More than on per foot of thickness

CEMENTATION

DESCRIPTION	DESCRIPTION
Weakly	Crumbles or breaks with handling of slight finger pressure
Moderately	Crumbles or breaks with considerable finger pressure
Strongly	Will not crumbles or breaks with finger pressure

MODIFIERS

DESCRIPTION	%
Trace	<5
Some	5 - 12
With	>12

MOISTURE CONTENT

DESCRIPTION	FIELD TEST
Dry	Absence of moisture, dusty, dry to the touch
Moist	Damp but no visible water
Wet	Visible water, usually soil below Water Table

FIGURE 3



BORING LOG

Hyde Park Jr. High School

BORING No. : B-1	JOB No. : 1220008	DATE : 9/28/2022	SHEET 1 OF 1
PROJECT : Hyde Park Jr. High School		SURF. EL. :	BORE DIA. : 8.0" DEPTH : 17'
		WATER EL. :	COORDINATES: Lat: 41.793443 Long: -111.825345
BORING TYPE : 3-1/4" HSA		CAD FILE : 1220008 Figures.dwg	

DEPTH, Ft.	GRAPHIC LOG	SAMPLE	SOIL DESCRIPTION	% FINER No. 200 SIEVE	BLOWS/Ft.	LIQUID LIMIT	PLASTIC LIMIT	MOISTURE CONTENT, %	SHEAR STRENGTH, TSF		WET/DRY UNIT WT., lb./cu.ft.
									● MINIATURE VANE	○ RESIDUAL MINIATURE VANE	
			Surface~10": Black clay top soil								
5			10"-14.5': Light brown CLAY (CL); mottlings, calcium deposits, moist to wet below water table, water in small sand lenses, stiff to medium stiff.		11			27			
				21	42	24	22				
10				13				26			
			14.5'~17': Light gray clay (CL), slight iron modeling, wet.		9	44	25	29			
15				7				25			
			End at 17'		8	48	25	35			
20											
25											
30											
35											
REMARKS :				REMARKS : Blows/Ft. obtained using a Standard Penetration Test (SPT) sampler driven with an automatic hammer							
FIELD ENG.: Jay				WTR DEPTH @ COMPL. : 8.0' on 9/28/22							
				COMPLETION DATE : 9/28/2022							

FIGURE 4



BORING LOG

Hyde Park Jr. High School

BORING No. : B-2	JOB No. : 1220008	DATE : 9/28/2022	SHEET 1 OF 1
PROJECT : Hyde Park Jr. High School		SURF. EL. :	BORE DIA. : 8.0" DEPTH : 14.5'
		WATER EL. :	COORDINATES: Lat: 41.793459 Long: -111.826288
BORING TYPE : 3-1/4" HSA		CAD FILE : 1220008 Figures.dwg	

DEPTH, Ft.	GRAPHIC LOG	SAMPLE	SOIL DESCRIPTION	% FINER No. 200 SIEVE	BLOWS/Ft.	LIQUID LIMIT	PLASTIC LIMIT	MOISTURE CONTENT, %	SHEAR STRENGTH, TSF		WET/DRY UNIT WT., lb./cu.ft.
									● MINIATURE VANE	○ RESIDUAL MINIATURE VANE	
			Surface~10": Black clay top soil								
5			10"-14.5': Light brown CLAY (CL); mottlings, calcium deposits, moist to wet below water table, water in small sand lenses, stiff to medium stiff.		41			17			
				21	46	23	23				
				16				25			
10				12				28			
15			End at 14.5'		8			28			
20											
25											
30											
35											
REMARKS :				REMARKS : Blows/Ft. obtained using a Standard Penetration Test (SPT) sampler driven with an automatic hammer							
FIELD ENG.: Jay				WTR DEPTH @ COMPL. : 7.0' on 9/28/22							
				COMPLETION DATE : 9/28/2022							

FIGURE 5



BORING LOG

Hyde Park Jr. High School

BORING No. : B-3	JOB No. : 1220008	DATE : 9/28/2022	SHEET 1 OF 1
PROJECT : Hyde Park Jr. High School		SURF. EL. :	BORE DIA. : 8.0" DEPTH : 14.5'
		WATER EL. :	COORDINATES: Lat: 41.794193 Long: -111.826587
BORING TYPE : 3-1/4" HSA		CAD FILE : 1220008 Figures.dwg	

DEPTH, Ft.	GRAPHIC LOG	SAMPLE	SOIL DESCRIPTION	% FINER No. 200 SIEVE	BLOWS/Ft.	LIQUID LIMIT	PLASTIC LIMIT	MOISTURE CONTENT, %	SHEAR STRENGTH, TSF		WET/DRY UNIT WT., lb./cu.ft.
									●	○	
			Surface~10": Black clay top soil								
5			10"-14.5': Light brown CLAY (CL); with layers of plastic CLAY (CH) mottlings, calcium deposits, moist to wet below water table, water in small sand lenses, stiff to medium stiff.		19			17			
					17	55	24	31			
					9			31			
10					8	35	22	29			
			End at 12'								
15											
20											
25											
30											
35											
REMARKS :				REMARKS : Blows/Ft. obtained using a Standard Penetration Test (SPT) sampler driven with an automatic hammer							
FIELD ENG.: Jay				WTR DEPTH @ COMPL. : 7.0' on 9/28/22							
				COMPLETION DATE : 9/28/2022							

FIGURE 6



BORING LOG

Hyde Park Jr. High School

BORING No. : B-4	JOB No. : 1220008	DATE : 9/28/2022	SHEET 1 OF 1
PROJECT : Hyde Park Jr. High School		SURF. EL. :	BORE DIA. : 8.0" DEPTH : 14.5'
BORING TYPE : 3-1/4" HSA		WATER EL. :	COORDINATES: Lat: 41.794559 Long:-111.826308
CAD FILE : 1220008 Figures.dwg			

DEPTH, Ft.	GRAPHIC LOG	SAMPLE	SOIL DESCRIPTION	% FINER No. 200 SIEVE	BLOWS/Ft.	LIQUID LIMIT	PLASTIC LIMIT	MOISTURE CONTENT, %	SHEAR STRENGTH, TSF		WET/DRY UNIT WT., lb./cu.ft.
									● MINIATURE VANE	○ RESIDUAL MINIATURE VANE	
			Surface~10": Black clay top soil								
5			10"-14.5': Light brown CLAY (CL); mottlings, calcium deposits, moist to wet below water table, water in small sand lenses, stiff to medium stiff.		31			21			
				17	46	24	24				
10				11				28			
				8				30			
15			End at 12'								
20											
25											
30											
35											
REMARKS :				REMARKS : Blows/Ft. obtained using a Standard Penetration Test (SPT) sampler driven with an automatic hammer							
FIELD ENG.: Jay				WTR DEPTH @ COMPL. : 7.0' on 9/28/22							
				COMPLETION DATE : 9/28/2022							

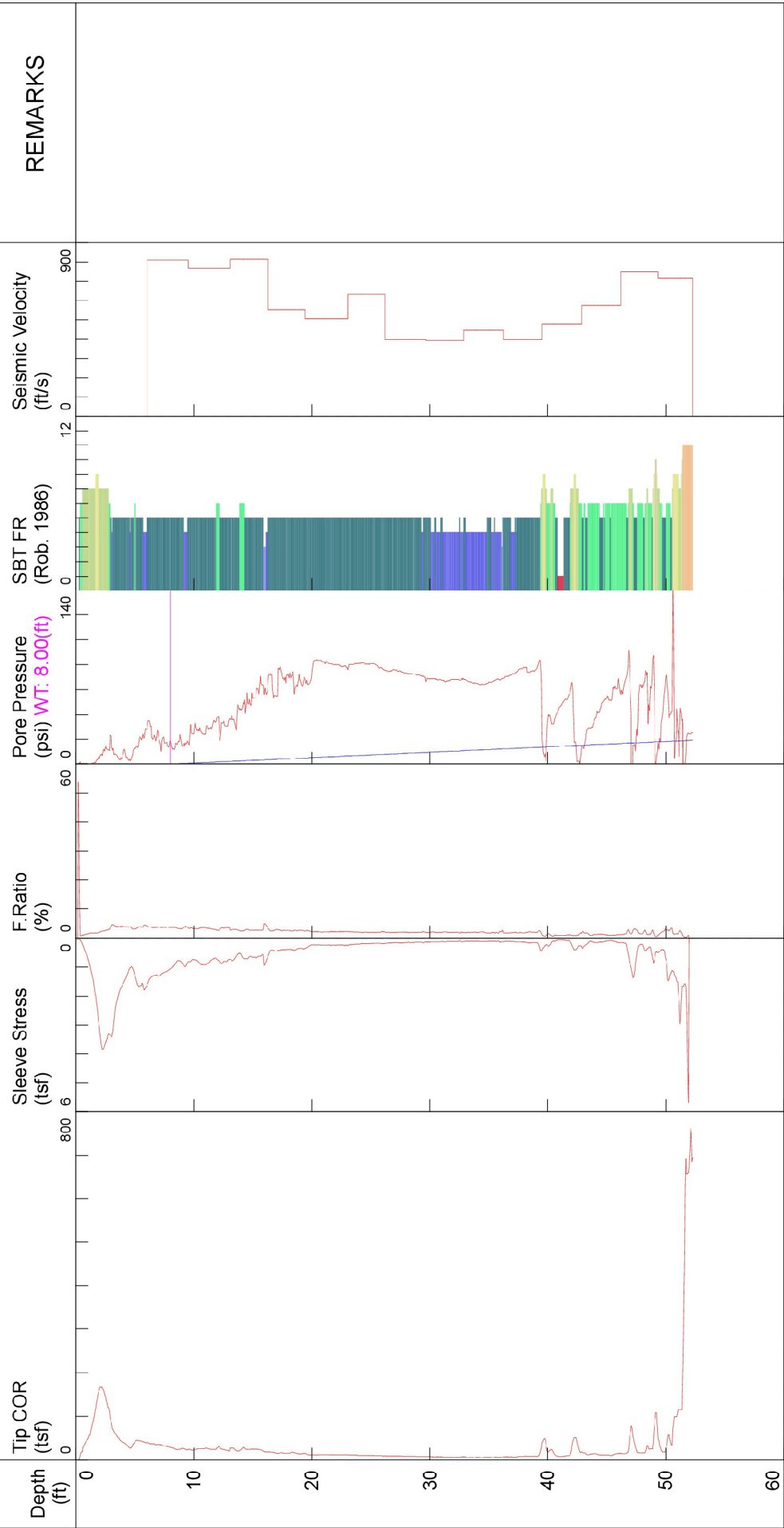
FIGURE 7

SOUNDING

ACache
Corp.
Engineering & Foundation

TOTAL DEPTH: 52.309 ft
SITE: CPT-01
SOUNDING
COMPANY: VERTEK
FILENAME: CPT-01.dat

PROBE ID: 4444.190XX
TEST ID: 22-08-31-01
PROJECT: CCSD Hyde Park
LOCATION: Compass Mineral Far West Utah

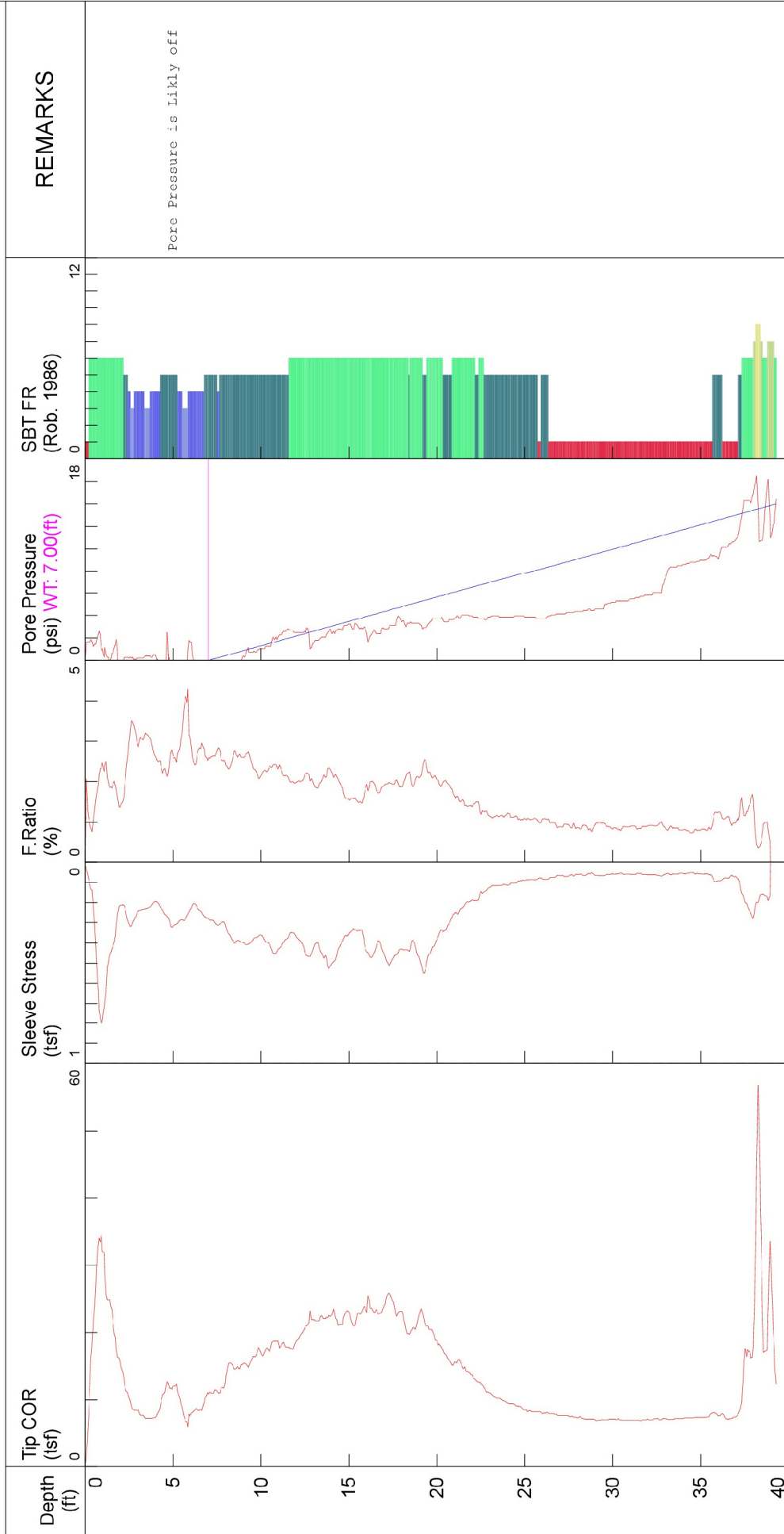


- FINAL BASELINE: -2.37 (tsf)
FINAL BASELINE: -0.065 (tsf)
FINAL BASELINE: 0.414 (psi)
FINAL BASELINE: 8.00 (psi)
- NOTES: Example of notes
- 1 Sensitive fine grained
 - 2 Organic material
 - 3 Clays
 - 4 Silty clay to clay
 - 5 Clayey silt to silty clay
 - 6 Sandy silt to clayey silt
 - 7 Silty sand to sandy silt
 - 8 sand to silty sand
 - 9 Sand
 - 10 Gravelly sand to sand
 - 11 Very stiff fine grained **
 - 12 Sand to clayey sand **
- *SBT: Robertson 1986, **Overconsolidated or Cemented; *SBT/SPT CORRELATION: UBC-1983

SOUNDING

ACache Corp.
 Engineering & Field Foundations
 TOTAL DEPTH: 39.323 ft
 SITE: CPT-02
 SOUNDING
 COMPANY: VERTEK
 FILENAME: CPT-02.dat

PROBE ID: 4444.190XX
 TEST ID: 22-08-31-02
 PROJECT: CCSD Hyde Park
 LOCATION: Hyde Park, Utah



REMARKS

Pore Pressure is likly off

FINAL BASELINE: -3.55 (tsf)

FINAL BASELINE: -0.0387 (tsf)

FINAL BASELINE: 0 or N/A

NOTES: Example of notes

- 1 Sensitive fine grained
- 2 Organic material
- 3 Clays
- 4 Silty clay to clay
- 5 Clayey silt to silty clay
- 6 Sandy silt to clayey silt
- 7 Silty sand to sandy silt
- 8 sand to silty sand
- 9 Sand
- 10 Gravely sand to sand
- 11 Very stiff fine grained **
- 12 Sand to clayey sand **

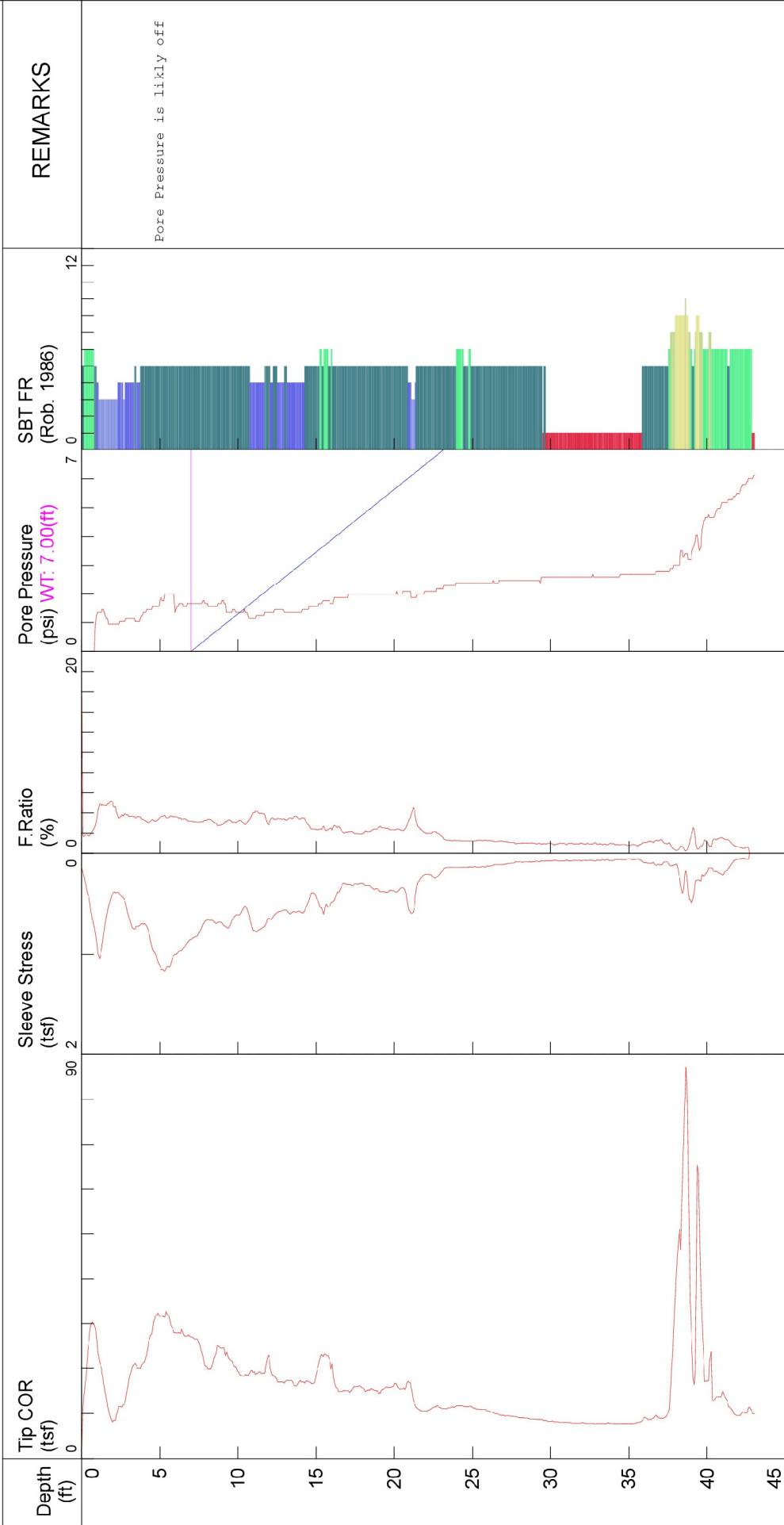
*SBT: Robertson 1986; **Overconsolidated or Cemented; *SBT/SPT CORRELATION: UBC-1983

FIGURE 9

SOUNDING

ACache Corp.
Engineering & Foundation
 TOTAL DEPTH: 43.046 ft
 SITE: CPT-03
 SOUNDING
 COMPANY: VERTEK
 FILENAME: CPT-03.dat

PROBE ID: 4444.190XX
 TEST ID: 22-08-31-03
 PROJECT: CCSD Hyde Park
 LOCATION: Hyde Park, Utah



FINAL BASELINE: -0.714 (psf)

FINAL BASELINE: -0.0381 (tsf)

FINAL BASELINE: 0 or N/A

NOTES: Example of notes

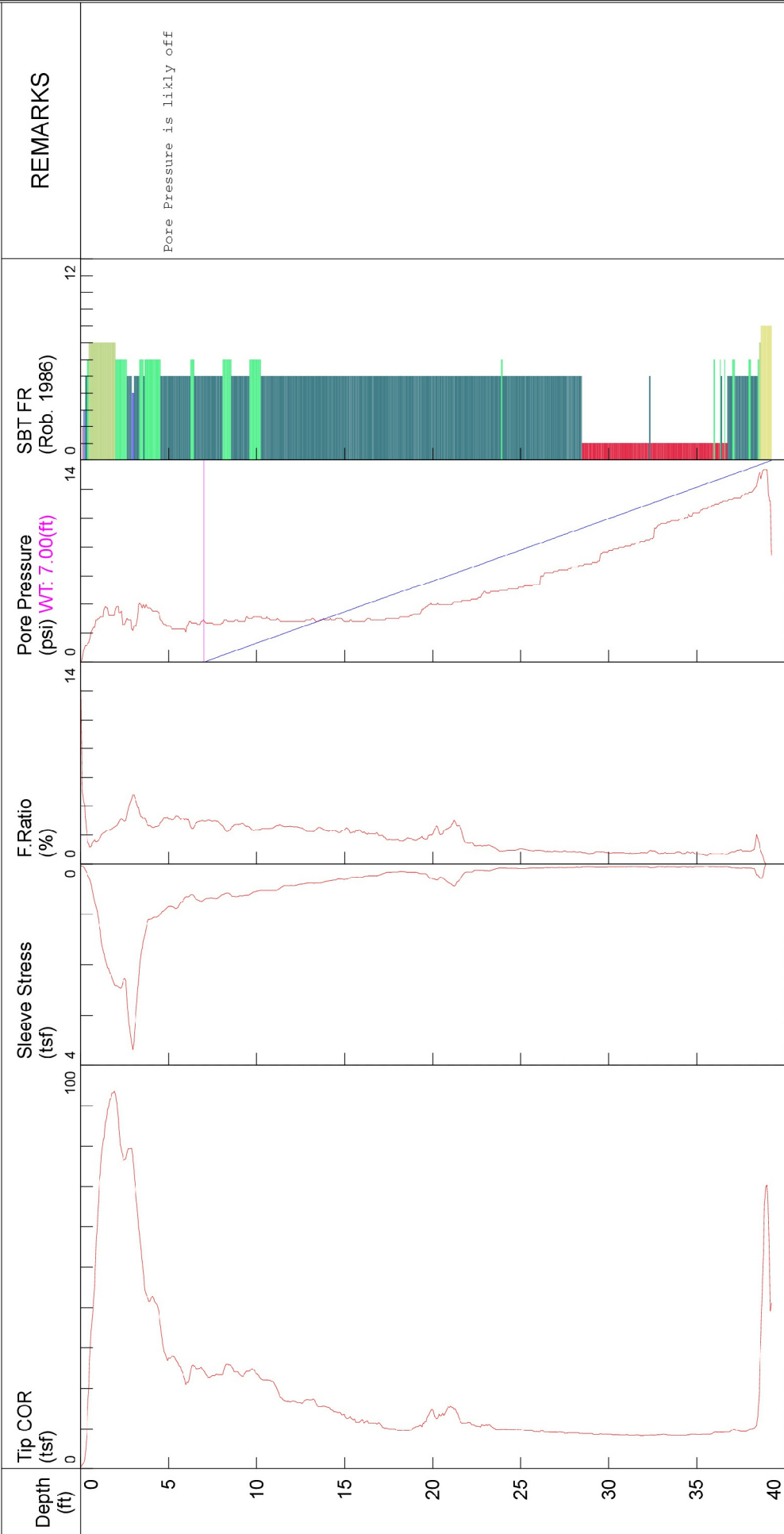
- 1 Sensitive fine grained
 - 2 Organic material
 - 3 Clays
 - 4 Silty clay to clay
 - 5 Clayey silt to silty clay
 - 6 Sandy silt to clayey silt
 - 7 Silty sand to sandy silt
 - 8 sand to silty sand
 - 9 Sand
 - 10 Gravelly sand to sand
 - 11 Very stiff fine grained **
 - 12 Sand to clayey sand **
- *SBT: Robertson 1986; ** Overconsolidated or Cemented; *SBT/SPT CORRELATION: UBC-1983

FIGURE 10

SOUNDING

ACache Corp.
 Engineering & Foundation
 TOTAL DEPTH: 39.242 ft
 SITE: CPT-04
 SOUNDING
 COMPANY: VERTEK
 FILENAME: CPT-04.dat

PROBE ID: 4444.190XX
 TEST ID: 22-08-31-04
 PROJECT: CCSD Hyde Park
 LOCATION: Hyde Park, Utah



REMARKS: Pore Pressure is likly off

FINAL BASELINE: 0.36 (tsf)
 FINAL BASELINE: -0.0343 (tsf)
 FINAL BASELINE: 0.104 (psi)

NOTES: Example of notes

- 1 Sensitive fine grained
- 2 Organic material
- 3 Clays
- 4 Silty clay to clay
- 5 Clayey silt to silty clay
- 6 Sandy silt to clayey silt
- 7 Silty sand to sandy silt
- 8 sand to silty sand
- 9 Sand
- 10 Gravelly sand to sand
- 11 Very stiff fine grained **
- 12 Sand to clayey sand **

*SBT: Robertson 1986; **Overconsolidated or Cemented; *SBT/SPT CORRELATION: UBC-1983

FIGURE 11

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**SECTION 00 5000
CONTRACTING FORMS AND SUPPLEMENTS**

PART 1 GENERAL

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

1.02 AGREEMENT AND CONDITIONS OF THE CONTRACT

A. The Agreement is based on AIA A101-2007.

1.03 FORMS

A. Use the following forms for the specified purposes unless otherwise indicated elsewhere in Contract Documents.

B. Bond Forms:

1. Performance and Payment Bond Form: Subcontract Performance and Payment Bond 00 6000.
2. Labor and Material: Labor and Material PaBond 00 6000

C. Post-Award Certificates and Other Forms:

1. Application for Payment Forms: AIA G702 with AIA G703 (for Contractors).

D. Clarification and Modification Forms:

1. Request for Interpretation Form: None - N/A.
2. Architect's Supplemental Instructions Form: AIA G710.
3. Request for Proposal Form: N/A.
4. Change Order Form: AIA G701.

E. Closeout Forms:

1. Certificate of Substantial Completion Form: AIA G704.

1.04 REFERENCE STANDARDS

- A. AIA A101-2007 - Standard Form of Agreement Between Owner and Contractor where the basis of Payment is a Stipulated Sum; 2007.
- B. AIA G701 - Change Order; 2017.
- C. AIA G702 - Application and Certificate for Payment; 1992.
- D. AIA G703 - Continuation Sheet; 1992.
- E. AIA G704 - Certificate of Substantial Completion; 2017.
- F. AIA G710 - Architect's Supplemental Instructions; 2017.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION 00 5000

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**SECTION 00 6000
PROJECT FORMS**

PROJECT FORMS

1.01 BID FORM

A. See attached document

1.02 TAX EXEMPTION CERTIFICATE FORM (TC-721)

A. See attached document

1.03 NEW PAYMENT REQUEST

A. See attached document

1.04 CONDITIONAL WAIVER AND RELEASE

A. See attached document

1.05 FINAL WAIVER AND RELEASE

A. See attached document

1.06 PURCHASE ORDER AGREEMENT

A. See attached document.

1.07 SUB-CONTRACT AGREEMENT

A. See attached document

1.08 REQUEST FOR TAXPAYER IDENTIFICATION NUMBER AND CERTIFICATION (W-9) FORM

A. See attached document.

END OF SECTION 00 6000

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Note to Bidders: There is no requirement to bid on both schools. Subcontractors and suppliers may bid on either of the schools or both schools. If you are bidding on both schools, please list each school separately along with a combined price including any cost savings if you are awarded both schools.

Bidding Section(s): _____

Nibley Middle School Base Bid: (\$ _____)

Written amount: _____ dollars

Hyde Park Middle School Base Bid: (\$ _____)

Written amount: _____ dollars

Combined Bid for Both Schools: (\$ _____)

Written amount: _____ dollars

(Please provide a combined price with any cost savings if subcontractor/supplier is awarded both schools)



BID ALTERNATES:

Deductive Alternate #1: Classroom Wing (8 Classrooms)

Bid alternate includes the completed building envelope, all utilities inside the classroom wing, all interior finishes and furnishings as required by the bidding documents. Please list the price for one school only!

Bidding Section(s): _____

Bid Alternate #1: **DEDUCT** (\$ _____)

Written amount: _____ dollars

Alternate #2: Ballistic Film

Bid alternate includes the cost to furnish and install ballistic film on all first-floor windows as required by the bidding documents and specification section 08 0723. Please list the price for one school only!

Bid Alternate #2: (\$ _____)

Written amount: _____ dollars

Alternate #3: 60 Mil PVC Roofing Materials

Bid alternate includes the cost to furnish and install a 60 Mil PVC roofing membrane, fully adhered system, in lieu of the 45 mil Fibertite system listed as the base bid. Please list the price for one school only!

Bid Alternate #3: (\$ _____)

Written amount: _____ dollars



Alternate #4: Interior/Exterior Lighting Controls (Excluding Theatrical Lighting Controls)

Lutron Lighting Controls is specified as the base bid. The district will also consider using Cooper, nLight, and Wattstopper as alternates for lighting controls(subject to approval). Please specify below if you are proposing one of the alternates

Base Bid: Lutron (\$_____)

Written amount: _____dollars

Bid Alternate #4: Specify One of the following: Cooper nLight Wattstopper

(\$_____)

Written amount: _____dollars

(In case of discrepancy between the written amount and numerical amount, written amount will govern)

End of Alternates



ADDITIONAL BIDDING REQUIREMENTS:

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

1. Bids shall be priced lump sum to furnish and / or install all material and / or equipment as required by plans and specifications for a complete installation. This project is tax exempt and tax should not be included.
2. The construction duration portion of this project will be 24 months or less. Material and equipment must be delivered and installed in accordance with the Construction Manager’s schedule. **Please note that the construction schedule is preliminary in nature and is subject to change during the duration of the project.** Liquidated damages are \$1000.00 per day. See Advertisement for Bids.
3. COST OF PAYMENT AND PERFORMANCE BOND: \$_____.
Only bids over \$50,000.00 will require a performance and payment bond at CM/Owner option.
(This amount will be added to the base bid amount if payment and performance bonds are required. If no amount is provided, it will be presumed that the bidder is unable to bond for their work on this project and may be cause for rejection).
4. The Construction Manager and Owner reserve the right to accept or reject any and all proposals or alternates with or without cause for any reason determined to be in the owner’s best interest and to waive any bidding informality or irregularity.
5. The undersigned bidder, having examined the Drawings, Specifications and related documents in their entirety, and the site of the proposed work, and being familiar with all of the conditions surrounding the construction of the proposed project including the availability of labor, hereby proposes to complete the work listed above in accordance with the Contract Documents and within the time set forth, at the price stated above and upon the subcontract form included in the Specifications. The above price is to cover all expenses incurred in performing the work required under the Contract Documents.
6. CONTRACTOR’S QUALIFICATION STATEMENT: Upon request the low bidders shall submit AIA Document A305 Contractor’s Qualification Statement. Failure to show a statement satisfactory to the Owner or Construction Manager will be reason to reject the bid as nonresponsive. Past performance on similar projects, the demonstrated ability to complete work on schedule and ability to perform the work on this project to the satisfaction of the Owner and Construction Manager will be a priority.

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

Name of Bidder:

Authorized Signature:

Date

Printed name of authorized signature:

Contact phone number:



Exemption Certificate for Governments & Schools
(Sales, Use, Tourism and Motor Vehicle Rental Tax)

Form with fields for Name of institution claiming exemption, Telephone Number, Street Address, City, State, ZIP Code, Authorized Signature, Name (please print), Title, Name of Seller or Supplier, and Date.

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:

Construction Materials Purchased for Airports
I certify the construction materials are purchased by, on behalf of, or for the benefit of Salt Lake International Airport, or a new airport owned or operated by a city in Davis, Utah, Washington or Weber County. I further certify the construction materials will be installed or converted into real property owned by and located at the airport.

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.



PAYMENT REQUEST FORM

Project Name: NEW HYDE PARK MIDDLE SCHOOL BID PACKAGE #2 SITE & BUILDING

Invoice/Payment Application Number: _____

Period Ending Date: _____

STATEMENT OF CONTRACT AMOUNT:

- | | | |
|----|--|----------|
| 1. | Original Contract Amount | \$ _____ |
| 2. | Approved Change Orders | \$ _____ |
| 3. | Adjusted Contract Amount <i>(Add or Subtract line 2 from line 1)</i> | \$ _____ |

PROGRESS BILLING:

- | | | |
|----|---|----------|
| 4. | Work Completed and Materials Provided on Contract to Date (____% to date) | \$ _____ |
| 5. | Less Retention (.5% to date) | \$ _____ |
| 6. | Total Work Completed and Materials Provided Less Retention <i>(Subtract line 5 from line 4)</i> | \$ _____ |
| 7. | Total Previous Application for Payments <i>(Line 6 from previous application)</i> | \$ _____ |
| 8. | AMOUNT DUE THIS REQUEST <i>(Subtract line 7 from line 6)</i> | \$ _____ |

LABOR & MATERIALS SUPPLIED THIS MONTH:

- | | | |
|-----|-------------------------------|----------|
| 9. | Materials supplied this month | \$ _____ |
| 10. | Labor this month | \$ _____ |

Supplier/Subcontractor Lien Releases (DWA provided forms) must be provided prior to distribution of payments.

Waiver & Releases attached to this payment request form? (circle one). Yes No

Name and Amount of Two-Party Checks required on this months draw: _____

Company Name: _____

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

By: _____
(Signature Here)

Print Name: _____

Title: _____

Date: _____



CONDITIONAL WAIVER AND RELEASE UPON PROGRESS PAYMENT

Property Name: New Hyde Park Middle School Bid Package 2 Site and Building

Property Location: 250 W 200 S, Hyde Park, Utah 84318

Undersigned's Customer: _____

Invoice/Payment Application Number: _____

Payment Amount: \$ _____

Payment Period: _____

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

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

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

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

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

Dated: _____

(Company Name)

By: _____

Its: _____



Purchase Order Agreement

This agreement made at Logan, State of Utah, on the 4th day of April, 2024 by and between **DWA CONSTRUCTION, INC. P.O. BOX 3448 LOGAN, UT 84323-3448 PHONE:(435)752-6860 FAX:(435)752-7606** hereinafter referred to as the prime Contractor and **SUPPLIER NAME; STREET ADDRESS; CITY, STATE ZIP CODE; PHONE(000)000-0000 FAX(000)000-0000**, hereinafter referred to as the Supplier.

The Supplier shall furnish all materials, fabrication labor and shop drawings required for section.

DESCRIPTION OF SECTION, FOB TO JOBSITE AS PER PLANS AND SPECIFICATIONS.

TOTAL CONTRACT AMOUNT: \$0,000.00

This project is not exempt. Addendum 01 acknowledged & included in price. Project completion 06-06-26

The construction project identified as HYDE PARK MIDDLE SCHOOL BID PACKAGE #2 SITE AND BUILDING, located at 250 W 200 S, HYDE PARK, State of UTAH, as shown in the plans and specifications pertaining to the above, named project and any other agreements made between the General Contractor and Supplier. The General Contractor and Architect shall have final approval to the design of the furnished items.

All materials shall be delivered F.O.B. jobsite by Supplier for the total purchase order price of **Zero thousand zero hundred dollars and 00 cents, \$0,000.00.**

Supplier shall be liable for all payroll taxes and related employee costs with respect to employees employed by same and shall furnish proof of worker's compensation insurance and liability insurance if requested by Prime Contractor.

DWA CONSTRUCTION, INC.

SUPPLIER NAME

SUBCONTRACT AGREEMENT

THIS SUBCONTRACT AGREEMENT (hereinafter Agreement), made at Logan, Utah, this 4th day of APRIL, 2024, by and between DWA CONSTRUCTION, INC., P.O. Box 3448, Logan, Utah 84323, hereinafter referred to as DWA, and SUBCONTRACTOR NAME: STREET ADDRESS; CITY, STATE, ZIP CODE; PHONE(000)000-0000 FAX: N/A, hereinafter referred to as the Subcontractor. DWA and Subcontractor agree as follows:

1. SCOPE OF WORK

a. The Project

HYDE PARK MIDDLE SCHOOL BID PACKAGE 2 SITE AND BUILDING
250 W 200 S
HYDE PARK, UTAH 84318

b. The work to be performed by the Subcontractor under the terms of this Agreement consists of completing the Work (as hereinafter defined) in a manner that all components will work as intended, and furnishing, without limitation, all labor, material, supplies, tools, implements, equipment, scaffolding, permits, fees, warranties, bonds, and taxes to complete all of the following in strict accordance with all applicable drawings, plans, specifications, and contract documents:

SECTION OR DIVISION NUMBER 00 0000 – DESCRIPTION OF SCOPE OF WORK; FURNISHED AND INSTALLED COMPLETE PER PLANS AND SPECIFICATIONS

ADDENDUMS 01 ACKNOWLEDGED

PROJECT COMPLETION DATE: 06-06-26

(All items to be performed by Subcontractor as described in sections 1.b., 1.c. and 1.d. are hereafter referenced as the “Work”).

Base Bid: \$ 0,000.00
Alternates: \$ _____
\$ _____

TOTAL AMOUNT: \$ 0,000.00

PROJECT IS EXEMPT FROM UTAH SALES TAX

c. Work per Contract. The Work shall be performed and completed in strict accordance with (1) the complete plans and specifications (hereinafter, the “Plans and Specifications”), as prepared by DESIGN WEST ARCHITECTS (hereinafter, “Architect”) for CACHE COUNTY SCHOOL DISTRICT (hereinafter, “Owner”); (2) DWA’s prime contract with Owner; and (3) all documents referenced in DWA’s prime contract with the Owner, including, without limitation, the Plans and Specifications and all addenda or authorized changes issued prior to the date of execution of this Agreement (hereafter collectively, the “Contract”). Subcontractor acknowledges receipt of a complete copy of the the Contract. No delineation of duties of the Subcontractor in this Agreement shall be utilized to avoid requirements of the Contract, including the Plans and Specifications, for the Work of Subcontractor.

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

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

f. Submittals. Within 30 days after it signs this Agreement, Subcontractor shall issue by mail or email all required submittals to DWA, together with detailed information as to how the submittals comply with the Contract. No submittal shall be deemed accepted until signed in writing by DWA, and acceptance by DWA does not change or waive the requirement for Subcontractor to comply with the Contract, Plans and Specifications and other documents for which Subcontractor remains responsible. Any rejected submittal shall be corrected and replaced by Subcontractor within seven (7) calendar days of notice of the rejection.

2. PAYMENTS

a. Requests for Payment. DWA agrees to pay to the Subcontractor for the satisfactory completion of the Work the sum of Zero thousand Zero hundred dollars and 00 cents***** (\$0,000.00) in monthly payments of 25% of the Work performed in any preceding month, in accordance with the Request for Payment prepared by the Subcontractor and as approved by DWA and Architect, such payments to be made only as payments are received by DWA from the Owner covering the approved portion of the Subcontractor’s monthly Request for Payment (“Draws”). Receipt of payment by DWA from Owner is an absolute condition precedent to any payment to Subcontractor, and payment to Subcontractor will only be made after DWA receives payment from the Owner. DWA may in its discretion make payments in the name of Subcontractor or by joint check to any employee, supplier, or subcontractors of Subcontractor (hereinafter collectively “Subs”) who have furnished materials or labor to said Subcontractor as part of the Work. Subcontractor shall credit the amounts of such payments against any amounts that DWA owes or allegedly owes to Subcontractor. Subcontractor agrees to use the attached Request for Payment (Exhibit A) in all submittals for payment, and with each submittal for payment to deliver a fully executed Lien Waiver (Exhibit B for progress payments and Exhibit C for Final Payment) for the Work completed to date in accordance with the Contract, including but not limited to Lien Waivers from all material suppliers and Subs, at all tiers. DWA may modify the form of the Request for Payment and Lien Waivers as needed in its sole discretion.

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

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

d. No Request for Payment. In the event the Subcontractor does not submit to DWA such Request for Payment prior to the date of submission of DWA's monthly Draw to Owner, then DWA may include in its monthly Draw to the Owner for work performed during the preceding month such amount as it shall deem proper for the Work of the Subcontractor for the preceding month, and the Subcontractor agrees to accept such approved portion thereof as its regular monthly payment, as described above, subject to all other terms of this Agreement.

e. Fiduciary Duty. The Subcontractor agrees that any funds received for the performance of the Work under this Agreement shall be used exclusively for labor, materials, and equipment furnished as part of the Work, that the Subcontractor has a fiduciary responsibility with respect to these funds, and that these funds will not be diverted to satisfy obligations the Subcontractor may have under any other contracts, debts, liabilities or obligations unrelated to the Work.

f. Withheld/Offset Payments. DWA may withhold a monthly payment and/or final payment to such extent as may be necessary in the exercise of DWA's discretion to protect DWA from loss for which the Subcontractor is responsible, including but not limited to, loss resulting from defective Work or untimely Work, third party claims, failure of Subcontractor to pay employees or suppliers, incomplete Requests for Payment, failure to submit required documentation, or the filing of any payment bond claim, mechanics lien, lis pendens or related claims. If Subcontractor has unfulfilled obligations to DWA on other projects, DWA may exercise a right of offset of sums from other projects due to DWA from Subcontractor against any payment due Subcontractor for the Work.

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

h. Final Payment and Warranty. Before final payment is made, the Subcontractor agrees to execute to DWA and/or the Owner a written final lien waiver (together with final lien waivers from all material suppliers and Subs) and/or lien releases, if necessary, and a written guarantee for its Work, agreeing to make good without cost to the Owner or DWA any and all defects due to imperfect workmanship and/or materials which may appear within the period so established in the Contract; and if no such period be stipulated in the Contract, then such guarantee shall be executed for a period of one year from date the Owner accepts the Work. The Subcontractor further agrees to execute any special guarantees as provided by the terms of the Contract, prior to final payment. DWA's payment of any sums to Subcontractor shall not constitute a waiver of any claims DWA may have against Subcontractor.

3. PROSECUTION OF WORK, DELAYS, ETC.

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

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

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

(1) This Agreement has been accepted in its entirety.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

4. SAFETY

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

5. SURETY BOND

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

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

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

7. INSURANCE

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

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

(1) Commercial General Liability policy (CGL) with limits not less than \$1,000,000 each occurrence and \$2,000,000 aggregate for the Work.

(a) CGL coverage must be written on ISO occurrence form CG 00 01 10/01 or an equivalent, providing coverage for the indemnifications required in this Agreement, including but not limited to independent contractors, products-completed operations, personal injury and property damage.

(b) DWA, Owner and all other parties required of DWA, must be named as an additional insured on the CGL policy using an additional insured endorsement that provides primary, non-contributory coverage AND completed operations coverage.

(c) The Subcontractor must maintain CGL coverage for itself and all additional insureds for the duration of the Work and maintain Complete Operations coverage for itself and each additional insured for at least 3 years after completion of the Work or the length of the state's statute of repose, whichever is greater.

(2) Business Automobile Liability coverage with limits of \$1,000,000 for each accident. Coverage should include liability arising out of all owned, leased, hired and non-owned automobiles.

(3) Commercial Umbrella coverage with limits of at least \$2,000,000. Coverage must include all entities that are additional insured on the CGL.

(4) Workers' Compensation and Employers' Liability coverage with limits of at least \$500,000 for each accident, \$500,000 for bodily injury by accident, and \$500,000 each employee for injury by disease.

(5) To the fullest extent permitted by law, all policies must provide a waiver of subrogation on the CGL, Business Automobile, Workers' Compensation and Umbrella Liability policies.

(6) A copy of the additional insured endorsements and policies must be provided to DWA prior to commencement of Work or within seven (7) days of written request of DWA, whichever first occurs.

c. All insurance must provide at least thirty (30) days written notice to DWA prior to cancellation of any insurance. All insurance must have a Best's rating of no less than A- and must be authorized to do business in the state where the Project is located.

d. If any insurance coverage, clauses or limits beyond those provided herein are required in the Contract, the Subcontractor shall provide the same.

8. ASSUMPTION OF DUTIES AND INDEMNIFICATION

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

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

9. CHANGES, ADDITIONS AND DEDUCTIONS

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

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

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

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

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

f. Subcontractor shall not proceed with any changes or alterations to the Plans and Specifications without written approval from Architect and DWA.

g. The Subcontractor shall promptly comply with construction directives.

10. BACK CHARGES

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

11. DISPUTES

In the event of any dispute between DWA and Subcontractor relating specifically to the scope of the Work, the dispute shall be resolved in the manner provided by the Contract. If none be provided, or if there arises any dispute arising from or relating to the Agreement or the Work, then such disputes shall be first submitted to mediation with a qualified mediator determined by the parties to this Agreement, and if mediation is not successful, then resolved, in DWA's sole discretion, by an arbitration panel consisting of three members, one selected by DWA, one by the Subcontractor, and the third member shall be selected by the first two members. If DWA selects arbitration, DWA and Subcontractor agree to be bound by the findings of any such panel of arbitration, finally and without recourse to any courts of law. If DWA elects to resolve the dispute through litigation, any lawsuit, action, or proceeding arising out of or relating to this Agreement shall be instituted in the federal courts of the United States of America located in the State of Utah or the state courts of the State of Utah. Each party irrevocably submits to the exclusive jurisdiction of such courts in any suit, action, or proceeding relating to or arising from the Agreement. In the event there is a dispute between DWA and Subcontractor that arises out of this Agreement or relates to the Work, and if there is a court action or arbitration as a result of such dispute, the party that prevails in such action shall be entitled to recover from the other its reasonable attorneys' fees and costs, including expert witness fees, consultant fees, and reasonable deposition costs.

12. DEFAULT AND TERMINATION OF CONTRACT

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

- (1) Failure to perform Work as required by the Schedule;
- (2) Failure or neglect to correct Work found to be defective by and at the reasonable discretion of DWA;

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

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

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

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

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

d. No Waiver of Default. No waiver by DWA of any of the provisions of this Agreement shall be effective unless explicitly set forth in writing and signed by DWA. Any failure by DWA to enforce or require the strict keeping and performance of any of the terms or conditions of this Agreement:

- (1) Shall not constitute a waiver of the terms or conditions of this Agreement,
- (2) Shall not affect or impair such terms or conditions in any way,
- (3) Shall not impair or waive the right of DWA to avail itself of such remedies as it may have for any breach or breaches of the terms or conditions of this Agreement.

e. Termination.

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

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

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

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

f. Conditions Following Subcontractor Termination for Cause.

(1) Right of Retention. Upon receipt or the sending of a Notification to Terminate, or upon termination of this Agreement for cause, the Subcontractor acknowledges the right of DWA to retain:

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

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

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

(3) Any funds retained pursuant to this Section shall be released in full to the Subcontractor within ten business days of the expiration of the applicable retention term if all warranty Work has been performed and completed pursuant to the terms of this Agreement.

g. Suspension. DWA may, for just cause or by direction, suspend all or part of the Subcontractor's Work. DWA will give written notice to the Subcontractor stating the nature, effective date and anticipated duration of such suspension, whereupon the Subcontractor shall suspend Work to the extent specified and shall place no further orders or perform no other Work except as permitted by DWA's notice of suspension. During the period of such suspension, the Subcontractor must care for all Work, materials, and equipment at the Project site or at storage areas under the Subcontractor's responsibility. The Agreement price shall be adjusted by Change Order if the cost of the Work is increased or decreased by reason of such suspension. If additional time for completion of the Work is required as a result of such suspension, the Subcontractor shall submit a written request for additional time prior to resuming the Work. Failure to submit a written request for additional time due to such suspension shall result in no extension of time being granted.

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

13. FINANCIAL POSITION

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

14. ENFORCEMENT

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

15. SEVERABILITY

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

16. GOVERNING LAW

All matters arising out of or relating to this Agreement shall be governed by and construed in accordance with the laws of the State of Utah without giving effect to any choice or conflict of law provision or rule.

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

CONTRACTOR:

DWA CONSTRUCTION, INC. _____

DATED: 04/04/24

By: _____

Title: PRESIDENT

SUBCONTRACTOR:

NAME OF SUBCONTRACTOR _____

DATED: _____

By: _____

Title: _____

Tax Id No. _____

Request for Taxpayer Identification Number and Certification

Go to www.irs.gov/FormW9 for instructions and the latest information.

**Give form to the
requester. Do not
send to the IRS.**

Before you begin. For guidance related to the purpose of Form W-9, see *Purpose of Form*, below.

Print or type. See Specific Instructions on page 3.	1	Name of entity/individual. An entry is required. (For a sole proprietor or disregarded entity, enter the owner's name on line 1, and enter the business/disregarded entity's name on line 2.)		
	2	Business name/disregarded entity name, if different from above.		
	3a	Check the appropriate box for federal tax classification of the entity/individual whose name is entered on line 1. Check only one of the following seven boxes. <input type="checkbox"/> Individual/sole proprietor <input type="checkbox"/> C corporation <input type="checkbox"/> S corporation <input type="checkbox"/> Partnership <input type="checkbox"/> Trust/estate <input type="checkbox"/> LLC. Enter the tax classification (C = C corporation, S = S corporation, P = Partnership) _____ Note: Check the "LLC" box above and, in the entry space, enter the appropriate code (C, S, or P) for the tax classification of the LLC, unless it is a disregarded entity. A disregarded entity should instead check the appropriate box for the tax classification of its owner. <input type="checkbox"/> Other (see instructions) _____	4 Exemptions (codes apply only to certain entities, not individuals; see instructions on page 3): Exempt payee code (if any) _____ Exemption from Foreign Account Tax Compliance Act (FATCA) reporting code (if any) _____ <i>(Applies to accounts maintained outside the United States.)</i>	
	3b	If on line 3a you checked "Partnership" or "Trust/estate," or checked "LLC" and entered "P" as its tax classification, and you are providing this form to a partnership, trust, or estate in which you have an ownership interest, check this box if you have any foreign partners, owners, or beneficiaries. See instructions _____ <input type="checkbox"/>		
	5	Address (number, street, and apt. or suite no.). See instructions.	Requester's name and address (optional)	
	6	City, state, and ZIP code		
	7	List account number(s) here (optional)		

Part I Taxpayer Identification Number (TIN)

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

Social security number									
or									
Employer identification number									

Note: If the account is in more than one name, see the instructions for line 1. See also *What Name and Number To Give the Requester* for guidelines on whose number to enter.

Part II Certification

Under penalties of perjury, I certify that:

1. The number shown on this form is my correct taxpayer identification number (or I am waiting for a number to be issued to me); and
2. I am not subject to backup withholding because (a) I am exempt from backup withholding, or (b) I have not been notified by the Internal Revenue Service (IRS) that I am subject to backup withholding as a result of a failure to report all interest or dividends, or (c) the IRS has notified me that I am no longer subject to backup withholding; and
3. I am a U.S. citizen or other U.S. person (defined below); and
4. The FATCA code(s) entered on this form (if any) indicating that I am exempt from FATCA reporting is correct.

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

Sign Here	Signature of U.S. person	Date
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General Instructions

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

Future developments. For the latest information about developments related to Form W-9 and its instructions, such as legislation enacted after they were published, go to www.irs.gov/FormW9.

What's New

Line 3a has been modified to clarify how a disregarded entity completes this line. An LLC that is a disregarded entity should check the appropriate box for the tax classification of its owner. Otherwise, it should check the "LLC" box and enter its appropriate tax classification.

New line 3b has been added to this form. A flow-through entity is required to complete this line to indicate that it has direct or indirect foreign partners, owners, or beneficiaries when it provides the Form W-9 to another flow-through entity in which it has an ownership interest. This change is intended to provide a flow-through entity with information regarding the status of its indirect foreign partners, owners, or beneficiaries, so that it can satisfy any applicable reporting requirements. For example, a partnership that has any indirect foreign partners may be required to complete Schedules K-2 and K-3. See the Partnership Instructions for Schedules K-2 and K-3 (Form 1065).

Purpose of Form

An individual or entity (Form W-9 requester) who is required to file an information return with the IRS is giving you this form because they

must obtain your correct taxpayer identification number (TIN), which may be your social security number (SSN), individual taxpayer identification number (ITIN), adoption taxpayer identification number (ATIN), or employer identification number (EIN), to report on an information return the amount paid to you, or other amount reportable on an information return. Examples of information returns include, but are not limited to, the following.

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

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

Caution: If you don't return Form W-9 to the requester with a TIN, you might be subject to backup withholding. See *What is backup withholding*, later.

By signing the filled-out form, you:

1. Certify that the TIN you are giving is correct (or you are waiting for a number to be issued);
2. Certify that you are not subject to backup withholding; or
3. Claim exemption from backup withholding if you are a U.S. exempt payee; and
4. Certify to your non-foreign status for purposes of withholding under chapter 3 or 4 of the Code (if applicable); and
5. Certify that FATCA code(s) entered on this form (if any) indicating that you are exempt from the FATCA reporting is correct. See *What Is FATCA Reporting*, later, for further information.

Note: If you are a U.S. person and a requester gives you a form other than Form W-9 to request your TIN, you must use the requester's form if it is substantially similar to this Form W-9.

Definition of a U.S. person. For federal tax purposes, you are considered a U.S. person if you are:

- An individual who is a U.S. citizen or U.S. resident alien;
- A partnership, corporation, company, or association created or organized in the United States or under the laws of the United States;
- An estate (other than a foreign estate); or
- A domestic trust (as defined in Regulations section 301.7701-7).

Establishing U.S. status for purposes of chapter 3 and chapter 4 withholding. Payments made to foreign persons, including certain distributions, allocations of income, or transfers of sales proceeds, may be subject to withholding under chapter 3 or chapter 4 of the Code (sections 1441–1474). Under those rules, if a Form W-9 or other certification of non-foreign status has not been received, a withholding agent, transferee, or partnership (payor) generally applies presumption rules that may require the payor to withhold applicable tax from the recipient, owner, transferor, or partner (payee). See Pub. 515, *Withholding of Tax on Nonresident Aliens and Foreign Entities*.

The following persons must provide Form W-9 to the payor for purposes of establishing its non-foreign status.

- In the case of a disregarded entity with a U.S. owner, the U.S. owner of the disregarded entity and not the disregarded entity.
- In the case of a grantor trust with a U.S. grantor or other U.S. owner, generally, the U.S. grantor or other U.S. owner of the grantor trust and not the grantor trust.
- In the case of a U.S. trust (other than a grantor trust), the U.S. trust and not the beneficiaries of the trust.

See Pub. 515 for more information on providing a Form W-9 or a certification of non-foreign status to avoid withholding.

Foreign person. If you are a foreign person or the U.S. branch of a foreign bank that has elected to be treated as a U.S. person (under Regulations section 1.1441-1(b)(2)(iv) or other applicable section for chapter 3 or 4 purposes), do not use Form W-9. Instead, use the appropriate Form W-8 or Form 8233 (see Pub. 515). If you are a qualified foreign pension fund under Regulations section 1.897(l)-1(d), or a partnership that is wholly owned by qualified foreign pension funds, that is treated as a non-foreign person for purposes of section 1445 withholding, do not use Form W-9. Instead, use Form W-8EXP (or other certification of non-foreign status).

Nonresident alien who becomes a resident alien. Generally, only a nonresident alien individual may use the terms of a tax treaty to reduce or eliminate U.S. tax on certain types of income. However, most tax treaties contain a provision known as a saving clause. Exceptions specified in the saving clause may permit an exemption from tax to continue for certain types of income even after the payee has otherwise become a U.S. resident alien for tax purposes.

If you are a U.S. resident alien who is relying on an exception contained in the saving clause of a tax treaty to claim an exemption from U.S. tax on certain types of income, you must attach a statement to Form W-9 that specifies the following five items.

1. The treaty country. Generally, this must be the same treaty under which you claimed exemption from tax as a nonresident alien.
2. The treaty article addressing the income.
3. The article number (or location) in the tax treaty that contains the saving clause and its exceptions.
4. The type and amount of income that qualifies for the exemption from tax.
5. Sufficient facts to justify the exemption from tax under the terms of the treaty article.

Example. Article 20 of the U.S.-China income tax treaty allows an exemption from tax for scholarship income received by a Chinese student temporarily present in the United States. Under U.S. law, this student will become a resident alien for tax purposes if their stay in the United States exceeds 5 calendar years. However, paragraph 2 of the first Protocol to the U.S.-China treaty (dated April 30, 1984) allows the provisions of Article 20 to continue to apply even after the Chinese student becomes a resident alien of the United States. A Chinese student who qualifies for this exception (under paragraph 2 of the first Protocol) and is relying on this exception to claim an exemption from tax on their scholarship or fellowship income would attach to Form W-9 a statement that includes the information described above to support that exemption.

If you are a nonresident alien or a foreign entity, give the requester the appropriate completed Form W-8 or Form 8233.

Backup Withholding

What is backup withholding? Persons making certain payments to you must under certain conditions withhold and pay to the IRS 24% of such payments. This is called "backup withholding." Payments that may be subject to backup withholding include, but are not limited to, interest, tax-exempt interest, dividends, broker and barter exchange transactions, rents, royalties, nonemployee pay, payments made in settlement of payment card and third-party network transactions, and certain payments from fishing boat operators. Real estate transactions are not subject to backup withholding.

You will not be subject to backup withholding on payments you receive if you give the requester your correct TIN, make the proper certifications, and report all your taxable interest and dividends on your tax return.

Payments you receive will be subject to backup withholding if:

1. You do not furnish your TIN to the requester;
2. You do not certify your TIN when required (see the instructions for Part II for details);
3. The IRS tells the requester that you furnished an incorrect TIN;
4. The IRS tells you that you are subject to backup withholding because you did not report all your interest and dividends on your tax return (for reportable interest and dividends only); or
5. You do not certify to the requester that you are not subject to backup withholding, as described in item 4 under "*By signing the filled-out form*" above (for reportable interest and dividend accounts opened after 1983 only).

Certain payees and payments are exempt from backup withholding. See *Exempt payee code*, later, and the separate Instructions for the Requester of Form W-9 for more information.

See also *Establishing U.S. status for purposes of chapter 3 and chapter 4 withholding*, earlier.

What Is FATCA Reporting?

The Foreign Account Tax Compliance Act (FATCA) requires a participating foreign financial institution to report all U.S. account holders that are specified U.S. persons. Certain payees are exempt from FATCA reporting. See *Exemption from FATCA reporting code*, later, and the Instructions for the Requester of Form W-9 for more information.

Updating Your Information

You must provide updated information to any person to whom you claimed to be an exempt payee if you are no longer an exempt payee and anticipate receiving reportable payments in the future from this person. For example, you may need to provide updated information if you are a C corporation that elects to be an S corporation, or if you are no longer tax exempt. In addition, you must furnish a new Form W-9 if the name or TIN changes for the account, for example, if the grantor of a grantor trust dies.

Penalties

Failure to furnish TIN. If you fail to furnish your correct TIN to a requester, you are subject to a penalty of \$50 for each such failure unless your failure is due to reasonable cause and not to willful neglect.

Civil penalty for false information with respect to withholding. If you make a false statement with no reasonable basis that results in no backup withholding, you are subject to a \$500 penalty.

Criminal penalty for falsifying information. Willfully falsifying certifications or affirmations may subject you to criminal penalties including fines and/or imprisonment.

Misuse of TINs. If the requester discloses or uses TINs in violation of federal law, the requester may be subject to civil and criminal penalties.

Specific Instructions

Line 1

You must enter one of the following on this line; **do not** leave this line blank. The name should match the name on your tax return.

If this Form W-9 is for a joint account (other than an account maintained by a foreign financial institution (FFI)), list first, and then circle, the name of the person or entity whose number you entered in Part I of Form W-9. If you are providing Form W-9 to an FFI to document a joint account, each holder of the account that is a U.S. person must provide a Form W-9.

• **Individual.** Generally, enter the name shown on your tax return. If you have changed your last name without informing the Social Security Administration (SSA) of the name change, enter your first name, the last name as shown on your social security card, and your new last name.

Note for ITIN applicant: Enter your individual name as it was entered on your Form W-7 application, line 1a. This should also be the same as the name you entered on the Form 1040 you filed with your application.

• **Sole proprietor.** Enter your individual name as shown on your Form 1040 on line 1. Enter your business, trade, or “doing business as” (DBA) name on line 2.

• **Partnership, C corporation, S corporation, or LLC, other than a disregarded entity.** Enter the entity’s name as shown on the entity’s tax return on line 1 and any business, trade, or DBA name on line 2.

• **Other entities.** Enter your name as shown on required U.S. federal tax documents on line 1. This name should match the name shown on the charter or other legal document creating the entity. Enter any business, trade, or DBA name on line 2.

• **Disregarded entity.** In general, a business entity that has a single owner, including an LLC, and is not a corporation, is disregarded as an entity separate from its owner (a disregarded entity). See Regulations section 301.7701-2(c)(2). A disregarded entity should check the appropriate box for the tax classification of its owner. Enter the owner’s name on line 1. The name of the owner entered on line 1 should never be a disregarded entity. The name on line 1 should be the name shown on the income tax return on which the income should be reported. For

example, if a foreign LLC that is treated as a disregarded entity for U.S. federal tax purposes has a single owner that is a U.S. person, the U.S. owner’s name is required to be provided on line 1. If the direct owner of the entity is also a disregarded entity, enter the first owner that is not disregarded for federal tax purposes. Enter the disregarded entity’s name on line 2. If the owner of the disregarded entity is a foreign person, the owner must complete an appropriate Form W-8 instead of a Form W-9. This is the case even if the foreign person has a U.S. TIN.

Line 2

If you have a business name, trade name, DBA name, or disregarded entity name, enter it on line 2.

Line 3a

Check the appropriate box on line 3a for the U.S. federal tax classification of the person whose name is entered on line 1. Check only one box on line 3a.

IF the entity/individual on line 1 is a(n) . . .	THEN check the box for . . .
• Corporation	Corporation.
• Individual or • Sole proprietorship	Individual/sole proprietor.
• LLC classified as a partnership for U.S. federal tax purposes or • LLC that has filed Form 8832 or 2553 electing to be taxed as a corporation	Limited liability company and enter the appropriate tax classification: P = Partnership, C = C corporation, or S = S corporation.
• Partnership	Partnership.
• Trust/estate	Trust/estate.

Line 3b

Check this box if you are a partnership (including an LLC classified as a partnership for U.S. federal tax purposes), trust, or estate that has any foreign partners, owners, or beneficiaries, and you are providing this form to a partnership, trust, or estate, in which you have an ownership interest. You must check the box on line 3b if you receive a Form W-8 (or documentary evidence) from any partner, owner, or beneficiary establishing foreign status or if you receive a Form W-9 from any partner, owner, or beneficiary that has checked the box on line 3b.

Note: A partnership that provides a Form W-9 and checks box 3b may be required to complete Schedules K-2 and K-3 (Form 1065). For more information, see the Partnership Instructions for Schedules K-2 and K-3 (Form 1065).

If you are required to complete line 3b but fail to do so, you may not receive the information necessary to file a correct information return with the IRS or furnish a correct payee statement to your partners or beneficiaries. See, for example, sections 6698, 6722, and 6724 for penalties that may apply.

Line 4 Exemptions

If you are exempt from backup withholding and/or FATCA reporting, enter in the appropriate space on line 4 any code(s) that may apply to you.

Exempt payee code.

- Generally, individuals (including sole proprietors) are not exempt from backup withholding.
- Except as provided below, corporations are exempt from backup withholding for certain payments, including interest and dividends.
- Corporations are not exempt from backup withholding for payments made in settlement of payment card or third-party network transactions.
- Corporations are not exempt from backup withholding with respect to attorneys’ fees or gross proceeds paid to attorneys, and corporations that provide medical or health care services are not exempt with respect to payments reportable on Form 1099-MISC.

The following codes identify payees that are exempt from backup withholding. Enter the appropriate code in the space on line 4.

1—An organization exempt from tax under section 501(a), any IRA, or a custodial account under section 403(b)(7) if the account satisfies the requirements of section 401(f)(2).

- 2—The United States or any of its agencies or instrumentalities.
- 3—A state, the District of Columbia, a U.S. commonwealth or territory, or any of their political subdivisions or instrumentalities.
- 4—A foreign government or any of its political subdivisions, agencies, or instrumentalities.
- 5—A corporation.
- 6—A dealer in securities or commodities required to register in the United States, the District of Columbia, or a U.S. commonwealth or territory.
- 7—A futures commission merchant registered with the Commodity Futures Trading Commission.
- 8—A real estate investment trust.
- 9—An entity registered at all times during the tax year under the Investment Company Act of 1940.
- 10—A common trust fund operated by a bank under section 584(a).
- 11—A financial institution as defined under section 581.
- 12—A middleman known in the investment community as a nominee or custodian.
- 13—A trust exempt from tax under section 664 or described in section 4947.

The following chart shows types of payments that may be exempt from backup withholding. The chart applies to the exempt payees listed above, 1 through 13.

IF the payment is for . . .	THEN the payment is exempt for . . .
• Interest and dividend payments	All exempt payees except for 7.
• Broker transactions	Exempt payees 1 through 4 and 6 through 11 and all C corporations. S corporations must not enter an exempt payee code because they are exempt only for sales of noncovered securities acquired prior to 2012.
• Barter exchange transactions and patronage dividends	Exempt payees 1 through 4.
• Payments over \$600 required to be reported and direct sales over \$5,000 ¹	Generally, exempt payees 1 through 5. ²
• Payments made in settlement of payment card or third-party network transactions	Exempt payees 1 through 4.

¹ See Form 1099-MISC, Miscellaneous Information, and its instructions.

² However, the following payments made to a corporation and reportable on Form 1099-MISC are not exempt from backup withholding: medical and health care payments, attorneys' fees, gross proceeds paid to an attorney reportable under section 6045(f), and payments for services paid by a federal executive agency.

Exemption from FATCA reporting code. The following codes identify payees that are exempt from reporting under FATCA. These codes apply to persons submitting this form for accounts maintained outside of the United States by certain foreign financial institutions. Therefore, if you are only submitting this form for an account you hold in the United States, you may leave this field blank. Consult with the person requesting this form if you are uncertain if the financial institution is subject to these requirements. A requester may indicate that a code is not required by providing you with a Form W-9 with "Not Applicable" (or any similar indication) entered on the line for a FATCA exemption code.

- A—An organization exempt from tax under section 501(a) or any individual retirement plan as defined in section 7701(a)(37).
- B—The United States or any of its agencies or instrumentalities.
- C—A state, the District of Columbia, a U.S. commonwealth or territory, or any of their political subdivisions or instrumentalities.
- D—A corporation the stock of which is regularly traded on one or more established securities markets, as described in Regulations section 1.1472-1(c)(1)(i).
- E—A corporation that is a member of the same expanded affiliated group as a corporation described in Regulations section 1.1472-1(c)(1)(i).

F—A dealer in securities, commodities, or derivative financial instruments (including notional principal contracts, futures, forwards, and options) that is registered as such under the laws of the United States or any state.

G—A real estate investment trust.

H—A regulated investment company as defined in section 851 or an entity registered at all times during the tax year under the Investment Company Act of 1940.

I—A common trust fund as defined in section 584(a).

J—A bank as defined in section 581.

K—A broker.

L—A trust exempt from tax under section 664 or described in section 4947(a)(1).

M—A tax-exempt trust under a section 403(b) plan or section 457(g) plan.

Note: You may wish to consult with the financial institution requesting this form to determine whether the FATCA code and/or exempt payee code should be completed.

Line 5

Enter your address (number, street, and apartment or suite number). This is where the requester of this Form W-9 will mail your information returns. If this address differs from the one the requester already has on file, enter "NEW" at the top. If a new address is provided, there is still a chance the old address will be used until the payor changes your address in their records.

Line 6

Enter your city, state, and ZIP code.

Part I. Taxpayer Identification Number (TIN)

Enter your TIN in the appropriate box. If you are a resident alien and you do not have, and are not eligible to get, an SSN, your TIN is your IRS ITIN. Enter it in the entry space for the Social security number. If you do not have an ITIN, see *How to get a TIN* below.

If you are a sole proprietor and you have an EIN, you may enter either your SSN or EIN.

If you are a single-member LLC that is disregarded as an entity separate from its owner, enter the owner's SSN (or EIN, if the owner has one). If the LLC is classified as a corporation or partnership, enter the entity's EIN.

Note: See *What Name and Number To Give the Requester*, later, for further clarification of name and TIN combinations.

How to get a TIN. If you do not have a TIN, apply for one immediately. To apply for an SSN, get Form SS-5, Application for a Social Security Card, from your local SSA office or get this form online at www.SSA.gov. You may also get this form by calling 800-772-1213. Use Form W-7, Application for IRS Individual Taxpayer Identification Number, to apply for an ITIN, or Form SS-4, Application for Employer Identification Number, to apply for an EIN. You can apply for an EIN online by accessing the IRS website at www.irs.gov/EIN. Go to www.irs.gov/Forms to view, download, or print Form W-7 and/or Form SS-4. Or, you can go to www.irs.gov/OrderForms to place an order and have Form W-7 and/or Form SS-4 mailed to you within 15 business days.

If you are asked to complete Form W-9 but do not have a TIN, apply for a TIN and enter "Applied For" in the space for the TIN, sign and date the form, and give it to the requester. For interest and dividend payments, and certain payments made with respect to readily tradable instruments, you will generally have 60 days to get a TIN and give it to the requester before you are subject to backup withholding on payments. The 60-day rule does not apply to other types of payments. You will be subject to backup withholding on all such payments until you provide your TIN to the requester.

Note: Entering "Applied For" means that you have already applied for a TIN or that you intend to apply for one soon. See also *Establishing U.S. status for purposes of chapter 3 and chapter 4 withholding*, earlier, for when you may instead be subject to withholding under chapter 3 or 4 of the Code.

Caution: A disregarded U.S. entity that has a foreign owner must use the appropriate Form W-8.

Part II. Certification

To establish to the withholding agent that you are a U.S. person, or resident alien, sign Form W-9. You may be requested to sign by the withholding agent even if item 1, 4, or 5 below indicates otherwise.

For a joint account, only the person whose TIN is shown in Part I should sign (when required). In the case of a disregarded entity, the person identified on line 1 must sign. Exempt payees, see *Exempt payee code*, earlier.

Signature requirements. Complete the certification as indicated in items 1 through 5 below.

1. Interest, dividend, and barter exchange accounts opened before 1984 and broker accounts considered active during 1983. You must give your correct TIN, but you do not have to sign the certification.

2. Interest, dividend, broker, and barter exchange accounts opened after 1983 and broker accounts considered inactive during 1983. You must sign the certification or backup withholding will apply. If you are subject to backup withholding and you are merely providing your correct TIN to the requester, you must cross out item 2 in the certification before signing the form.

3. Real estate transactions. You must sign the certification. You may cross out item 2 of the certification.

4. Other payments. You must give your correct TIN, but you do not have to sign the certification unless you have been notified that you have previously given an incorrect TIN. "Other payments" include payments made in the course of the requester's trade or business for rents, royalties, goods (other than bills for merchandise), medical and health care services (including payments to corporations), payments to a nonemployee for services, payments made in settlement of payment card and third-party network transactions, payments to certain fishing boat crew members and fishermen, and gross proceeds paid to attorneys (including payments to corporations).

5. Mortgage interest paid by you, acquisition or abandonment of secured property, cancellation of debt, qualified tuition program payments (under section 529), ABLE accounts (under section 529A), IRA, Coverdell ESA, Archer MSA or HSA contributions or distributions, and pension distributions. You must give your correct TIN, but you do not have to sign the certification.

What Name and Number To Give the Requester

For this type of account:	Give name and SSN of:
1. Individual	The individual
2. Two or more individuals (joint account) other than an account maintained by an FFI	The actual owner of the account or, if combined funds, the first individual on the account ¹
3. Two or more U.S. persons (joint account maintained by an FFI)	Each holder of the account
4. Custodial account of a minor (Uniform Gift to Minors Act)	The minor ²
5. a. The usual revocable savings trust (grantor is also trustee)	The grantor-trustee ¹
b. So-called trust account that is not a legal or valid trust under state law	The actual owner ¹
6. Sole proprietorship or disregarded entity owned by an individual	The owner ³
7. Grantor trust filing under Optional Filing Method 1 (see Regulations section 1.671-4(b)(2)(i)(A))**	The grantor*

For this type of account:	Give name and EIN of:
8. Disregarded entity not owned by an individual	The owner
9. A valid trust, estate, or pension trust	Legal entity ⁴
10. Corporation or LLC electing corporate status on Form 8832 or Form 2553	The corporation
11. Association, club, religious, charitable, educational, or other tax-exempt organization	The organization
12. Partnership or multi-member LLC	The partnership
13. A broker or registered nominee	The broker or nominee
14. Account with the Department of Agriculture in the name of a public entity (such as a state or local government, school district, or prison) that receives agricultural program payments	The public entity
15. Grantor trust filing Form 1041 or under the Optional Filing Method 2, requiring Form 1099 (see Regulations section 1.671-4(b)(2)(i)(B))**	The trust

¹ List first and circle the name of the person whose number you furnish. If only one person on a joint account has an SSN, that person's number must be furnished.

² Circle the minor's name and furnish the minor's SSN.

³ You must show your individual name on line 1, and enter your business or DBA name, if any, on line 2. You may use either your SSN or EIN (if you have one), but the IRS encourages you to use your SSN.

⁴ List first and circle the name of the trust, estate, or pension trust. (Do not furnish the TIN of the personal representative or trustee unless the legal entity itself is not designated in the account title.)

* **Note:** The grantor must also provide a Form W-9 to the trustee of the trust.

** For more information on optional filing methods for grantor trusts, see the Instructions for Form 1041.

Note: If no name is circled when more than one name is listed, the number will be considered to be that of the first name listed.

Secure Your Tax Records From Identity Theft

Identity theft occurs when someone uses your personal information, such as your name, SSN, or other identifying information, without your permission to commit fraud or other crimes. An identity thief may use your SSN to get a job or may file a tax return using your SSN to receive a refund.

To reduce your risk:

- Protect your SSN,
- Ensure your employer is protecting your SSN, and
- Be careful when choosing a tax return preparer.

If your tax records are affected by identity theft and you receive a notice from the IRS, respond right away to the name and phone number printed on the IRS notice or letter.

If your tax records are not currently affected by identity theft but you think you are at risk due to a lost or stolen purse or wallet, questionable credit card activity, or a questionable credit report, contact the IRS Identity Theft Hotline at 800-908-4490 or submit Form 14039.

For more information, see Pub. 5027, Identity Theft Information for Taxpayers.

Victims of identity theft who are experiencing economic harm or a systemic problem, or are seeking help in resolving tax problems that have not been resolved through normal channels, may be eligible for Taxpayer Advocate Service (TAS) assistance. You can reach TAS by calling the TAS toll-free case intake line at 877-777-4778 or TTY/TDD 800-829-4059.

Protect yourself from suspicious emails or phishing schemes.

Phishing is the creation and use of email and websites designed to mimic legitimate business emails and websites. The most common act is sending an email to a user falsely claiming to be an established legitimate enterprise in an attempt to scam the user into surrendering private information that will be used for identity theft.

The IRS does not initiate contacts with taxpayers via emails. Also, the IRS does not request personal detailed information through email or ask taxpayers for the PIN numbers, passwords, or similar secret access information for their credit card, bank, or other financial accounts.

If you receive an unsolicited email claiming to be from the IRS, forward this message to phishing@irs.gov. You may also report misuse of the IRS name, logo, or other IRS property to the Treasury Inspector General for Tax Administration (TIGTA) at 800-366-4484. You can forward suspicious emails to the Federal Trade Commission at spam@uce.gov or report them at www.ftc.gov/complaint. You can contact the FTC at www.ftc.gov/idtheft or 877-IDTHEFT (877-438-4338). If you have been the victim of identity theft, see www.IdentityTheft.gov and Pub. 5027.

Go to www.irs.gov/IdentityTheft to learn more about identity theft and how to reduce your risk.

Privacy Act Notice

Section 6109 of the Internal Revenue Code requires you to provide your correct TIN to persons (including federal agencies) who are required to file information returns with the IRS to report interest, dividends, or certain other income paid to you; mortgage interest you paid; the acquisition or abandonment of secured property; the cancellation of debt; or contributions you made to an IRA, Archer MSA, or HSA. The person collecting this form uses the information on the form to file information returns with the IRS, reporting the above information. Routine uses of this information include giving it to the Department of Justice for civil and criminal litigation and to cities, states, the District of Columbia, and U.S. commonwealths and territories for use in administering their laws. The information may also be disclosed to other countries under a treaty, to federal and state agencies to enforce civil and criminal laws, or to federal law enforcement and intelligence agencies to combat terrorism. You must provide your TIN whether or not you are required to file a tax return. Under section 3406, payors must generally withhold a percentage of taxable interest, dividends, and certain other payments to a payee who does not give a TIN to the payor. Certain penalties may also apply for providing false or fraudulent information.

**SECTION 00 7200
GENERAL CONDITIONS**

FORM OF GENERAL CONDITIONS

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

RELATED REQUIREMENTS

2.01 SECTION 00 7300 - SUPPLEMENTARY CONDITIONS.

2.02 SECTION 01 4216 - DEFINITIONS.

SUPPLEMENTARY CONDITIONS

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

END OF SECTION 00 7200

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**SECTION 00 7300
SUPPLEMENTARY CONDITIONS**

PART 1 GENERAL

1.01 SUMMARY

- A. These Supplementary Conditions amend and supplement the General Conditions defined in Document 00 7200 - General Conditions and other provisions of Contract Documents as indicated below. Provisions that are not so amended or supplemented remain in full force and effect.
- B. The terms used in these Supplementary Conditions that are defined in the General Conditions have the meanings assigned to them in the General Conditions.

1.02 RELATED SECTIONS

- A. Section 00 5000 - Contracting Forms and Supplements.
- B. Section 01 4216 - Definitions.

1.03 REFERENCE STANDARDS

- A. AIA A503 - Guide for Supplementary Conditions, including Amendments to AIA Documents A201, the 2017 Owner-Contractor Agreements, and the 2019 Owner-Construction Manager as Constructor Agreements; 2019.

1.04 MODIFICATIONS TO GENERAL CONDITIONS

- A. ARTICLE 2 OWNER
 - 1. Delete Section 2.3.6 and substitute the following:
 - a. 2.3.6 The Owner shall furnish the Contract Documents to the Contractor in digital format. If the Contractor requires paper documents, the Contractor shall be responsible for the costs of producing such paper documents.
- B. ARTICLE 3 CONTRACTOR
 - 1. Add the following Section 3.2.5 to Section 3.2:
 - a. 3.2.5 The Owner is entitled to reimbursement from the Contractor for amounts paid to the Architect for evaluating and responding to the Contractor's requests for information that are not prepared in accordance with the Contract Documents or where the requested information is available to the Contractor from a careful study and comparison of the Contract Documents, field conditions, other Owner-provided information, Contractor-prepared coordination drawings, or prior Project correspondence or documentation.
 - 2. Add the following to the end of Section 3.4.2:
 - a. 3.4.2.2 The Owner shall be entitled to reimbursement from the Contractor for amounts paid to the Architect for reviewing the Contractor's proposed substitutions and making agreed-upon changes in the Drawings and Specifications resulting from such substitutions.
 - 3. Delete Section 3.6 and substitute the following:
 - a. 3.6 The contractor, subcontracts, and suppliers shall not include Utah State sales tax on any construction materials for this project. A tax ID # will be provided for the sole purpose of the purchase of material for this project only.
 - 4. Add Section 3.12.11 to Section 3.12:
 - a. 3.12.11 The Architect's review of Contractor's submittals will be limited to examination of an initial submittal and two (2) resubmittals. The Contractor shall reimburse the Owner for amounts paid to the Architect for evaluation of additional resubmittals.
- C. ARTICLE 4 ARCHITECT
 - 1. Add Section 4.2.2.1 to Section 4.2.2:
 - a. 4.2.2.1 The Owner is entitled to reimbursement from the Contractor for amounts paid to the Architect for site visits made necessary by the fault of the Contractor or by defects and deficiencies in the Work.

2. The following language may be added as Section 4.2.7.1:
 - a. 4.2.7.1 In no case will the Architect's review period on any submittal be less than ten (10) days after receipt of the submittal from the Contractor.

D. ARTICLE 7 CHANGES IN THE WORK

1. Add the following Section 7.1.4 to Section 7.1:
 - a. 7.1.4 The combined overhead and profit included in the total cost to the Owner for a change in the Work shall be based on the following schedule:
 - 1) For the Contractor, for Work performed by the Contractor's own forces, 15 percent overhead and profit of the cost on all self performed work under \$5,000, 10 percent on all work from \$5 - 10,000, and 5 percent on all work over \$10,000.
 - 2) For the Contractor, for Work performed by the Contractor's Subcontractors, 5 percent of the amount due the Subcontractors.
 - 3) For each Subcontractor involved, for Work performed by that Subcontractor's own forces, the percentages to the same as in item 1) above.
 - 4) For each Subcontractor involved, for Work performed by the Subcontractor's Subsubcontractors, 5 percent of the amount due the Sub-subcontractor.
 - 5) Cost to which overhead and profit is to be applied shall be determined in accordance with Section 7.3.4.
2. Add the following Section 7.1.5 to Section 7.1:
 - a. 7.1.5 In order to facilitate checking of proposals for increases or decreases to the contract sum, all proposals, except those so minor that their propriety can be seen by inspection, shall be accompanied by a complete itemization of costs including labor, materials and Subcontracts. Labor and materials shall be itemized in the manner prescribed above. Where major cost items are Subcontracts, they shall be itemized also. In no case will a change involving over \$500.00 be approved without such itemization.
3. Delete Section 7.2 and substitute the following:
 - a. 7.2 Change Orders
 - b. 7.2.1 A Change Order is a written instrument signed by the Owner, Contractor, and Architect stating their agreement upon all of the following:
 - 1) The change in the Work;
 - 2) The amount of the adjustment, if any, in the Contract Sum; and
 - 3) The extent of the adjustment, if any, in the Contract Time.
 - c. 7.2.2 Except as otherwise provided in the Contract Documents, the Contractor shall prepare the Change Order form, which may include supporting materials prepared by the Architect, for review and approval by the Owner and Architect.
 - d. 7.2.3 The Owner will pay R.S. Means costs adjusted for Salt Lake City for all change orders.

E. ARTICLE 9 PAYMENTS AND COMPLETION

1. Add the following sentence to Section 9.3.1:
 - a. The form of Application for Payment, duly notarized, shall be AIA Document G702™-1992, Application and Certificate for Payment, supported by AIA Document G703™-1992, Continuation Sheet.
2. Add the following Section 9.8.3.1 to Section 9.8.3:
 - a. 9.8.3.1 The Architect will perform no more than three (3) inspections to determine whether the Work or a designated portion thereof has attained Substantial Completion in accordance with the Contract Documents. The Owner is entitled to reimbursement from the Contractor for amounts paid to the Architect for any additional inspections in the amount of \$250.00 or the actual cost of each follow up visit by the Architect or Engineer.
3. Add the following Section 9.10.1.1 to Section 9.10.1:
 - a. 9.10.1.1 The Architect will perform no more than three (3) inspections to determine whether the Work or a designated portion thereof has attained Final Completion in accordance with the Contract Documents. The Owner is entitled to reimbursement from the Contractor for amounts paid to the Architect for any additional inspections.

F. ARTICLE 10 PROTECTION OF PERSONS AND PROPERTY

1. Add the following Section 10.2.4.1 to Section 10.2.4:

- a. 10.2.4.1 When use or storage of explosives, or other hazardous materials, substances or equipment, or unusual methods, are necessary for execution of the Work, the Contractor shall give the Owner reasonable advance notice.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION 00 7300

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**SECTION 00 7400
SUPPLEMENTARY GENERAL CONDITIONS**

PART 1 GENERAL

1.01 RELATED SECTIONS

- A. 00 2113 - CMGC Supplemental Instructions to Bidders
- B. 00 4100 - Bid Forms
- C. 00 5200 - Sample Subcontract Agreement
- D. 00 7200 - General Conditions
- E. Administrative and Procedural Items: Division 1.

1.02 SUPPLEMENTARY CONDITIONS:

- A. Time of Completion:
 - 1. The General Contractor shall begin work upon notice to proceed. The work shall be completed at a later date to be determined.
 - 2. Contractor also agrees to pay liquidated damages in accordance with Supplementary Conditions and Bid Proposal if contractors delay makes the damages applicable.
- B. Liquidated Damages:
 - 1. Time is of the essence. Should the Contractor fail to complete the work within the specified times, or within such additional time as may be allowed by extension, there shall be deducted from any monies due to the Contractor the sum of \$1,000.00 per day, for each and every calendar day beyond the agreed date of substantial completion or extended completion day that the work remains uncompleted in each individual trade contract. Such sum is fixed and agreed upon by the Owner and Contractor (and his surety) as liquidated damages due the Owner by reason of the inconvenience and added costs of administration, engineering and supervision resulting from the Contractor's default, and not as a penalty.
 - 2. Permitting the Contractor to continue and finish the work or any part of it 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 Contract.

END OF SECTION 00 7400

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**SECTION DC B
SHELL CRITERIA**

PART 1 GENERAL (NOT USED)

PART 2 PRODUCTS AND METHODS (NOT USED)

PART 3 DESIGN CRITERIA

3.01 COMCHECK SCHEDULE

- A. See attached following this section.
 - 1. Envelope Compliance Certificate
 - 2. Interior Lighting Compliance Certificate
 - 3. Exterior Lighting Compliance Certificate
 - 4. Mechanical Compliance Certificate
 - 5. Inspection Checklist

END OF SECTION DC B

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COMcheck Software Version COMcheckWeb

Envelope Compliance Certificate

Project Information

Energy Code: 2021 IECC
 Project Title: CCSD Middle School - Nibley
 Location: Nibley (Cache), Utah
 Climate Zone: 5b
 Project Type: New Construction
 Vertical Glazing / Wall Area: 16%

Construction Site: 3050 s 920 w Nibley, Utah
 Owner/Agent:
 Designer/Contractor:

Additional Efficiency Package(s)

Credits: 10.0 Required 44.0 Proposed
 Reduced lighting power, 39.0 credit
 Enhanced digital lighting controls, 2.0 credit
 Energy monitoring, 3.0 credit

Building Area

Floor Area

1-School/University : Nonresidential	160630
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Envelope Assemblies

Assembly	Gross Area or Perimeter	Cavity R-Value	Cont. R-Value	Proposed U-Factor	Budget U-Factor ^(a)
Floor: Unheated Slab-On-Grade, [Bldg. Use 1 - School/University] (c)	2013	---	---	0.730	0.520
Roof: Insulation Entirely Above Deck, [Bldg. Use 1 - School/University]	43500	---	37.5	0.026	0.032
NORTH					
Ext. Wall: Solid Concrete, 8in. Thickness, Normal Density, Furring: None, [Bldg. Use 1 - School/University]	8878	---	24.0	0.039	0.090
Door: Glass (over 50 9.56976e-315lazing): Metal Frame, Entrance Door, Perf. Specs.: Product ID KAWNER 500 WIDE STILE, SHGC 0.20, [Bldg. Use 1 - School/University] (b)	121	---	---	0.380	0.630
Window: Metal Frame with Thermal Break: Fixed, Perf. Specs.: Product ID KAWNEER TRIFAB 450T, SHGC 0.20, [Bldg. Use 1 - School/University] (b)	1900	---	---	0.380	0.360
Ext. Wall: Steel-Framed, 16in. o.c., [Bldg. Use 1 - School/University]	788	16.0	10.0	0.054	0.055
Door: Glass (over 50 9.56976e-315lazing): Metal Frame, Entrance Door, Perf. Specs.: Product ID KAWNEER 500 WIDE STILE, SHGC 0.20, [Bldg. Use 1 - School/University] (b)	103	---	---	0.380	0.630
Window: Metal Frame with Thermal Break: Fixed, Perf. Specs.: Product ID KAWNEER TRIFAB 450T, SHGC 0.20, [Bldg. Use 1 - School/University] (b)	290	---	---	0.380	0.360
Ext. Wall: Solid Concrete, 10in. Thickness, Normal Density, Furring: None, [Bldg. Use 1 - School/University]	5222	---	24.0	0.039	0.090
Window: Metal Frame with Thermal Break: Fixed, Perf. Specs.: Product ID KAWNEER TRIFAB 450T, SHGC 0.20, [Bldg. Use 1 - School/University] (b)	192	---	---	0.380	0.360

EAST

Assembly	Gross Area or Perimeter	Cavity R-Value	Cont. R-Value	Proposed U-Factor	Budget U- Factor ^(a)
Ext. Wall: Solid Concrete, 8in. Thickness, Normal Density, Furring: None, [Bldg. Use 1 - School/University]	11288	---	24.0	0.039	0.090
Window: Metal Frame with Thermal Break: Fixed, Perf. Specs.: Product ID KAWNEER TRIFAB 450T, SHGC 0.20, [Bldg. Use 1 - School/University] (b)	2068	---	---	0.380	0.360
Door: Glass (over 50 9.56976e-315lazing): Metal Frame, Entrance Door, Perf. Specs.: Product ID KAWNEER 500 WIDE STYLE, SHGC 0.20, [Bldg. Use 1 - School/University] (b)	126	---	---	0.380	0.630
Door: Insulated Metal, Swinging, [Bldg. Use 1 - School/University]	46	---	---	0.370	0.370
Ext. Wall: Steel-Framed, 16in. o.c., [Bldg. Use 1 - School/University]	1026	16.0	10.0	0.054	0.055
Window: Metal Frame with Thermal Break: Fixed, Perf. Specs.: Product ID KAWNEER TRIFAB 450T, SHGC 0.20, [Bldg. Use 1 - School/University] (b)	470	---	---	0.380	0.360
Door: Glass (over 50 9.56976e-315lazing): Metal Frame, Entrance Door, Perf. Specs.: Product ID KAWNEER 500 WIDE STILE, SHGC 0.20, [Bldg. Use 1 - School/University] (b)	26	---	---	0.380	0.630
Ext. Wall: Solid Concrete, 10in. Thickness, Normal Density, Furring: None, [Bldg. Use 1 - School/University]	330	---	24.0	0.039	0.090
SOUTH					
Ext. Wall: Solid Concrete, 10in. Thickness, Normal Density, Furring: None, [Bldg. Use 1 - School/University]	4154	---	24.0	0.039	0.090
Window: Metal Frame with Thermal Break: Fixed, Perf. Specs.: Product ID KAWNEER TRIFAB 450T, SHGC 0.20, [Bldg. Use 1 - School/University] (b)	192	---	---	0.380	0.360
Door: Insulated Metal, Swinging, [Bldg. Use 1 - School/University]	46	---	---	0.370	0.370
Ext. Wall: Solid Concrete, 8in. Thickness, Normal Density, Furring: None, [Bldg. Use 1 - School/University]	9673	---	24.0	0.039	0.090
Window: Metal Frame with Thermal Break: Fixed, Perf. Specs.: Product ID KAWNEER TRIFAB 450T, SHGC 0.20, [Bldg. Use 1 - School/University] (b)	500	---	---	0.380	0.360
Door: Glass (over 50 9.56976e-315lazing): Metal Frame, Entrance Door, Perf. Specs.: Product ID KAWNEER 500 WIDE STYLE, SHGC 0.20, [Bldg. Use 1 - School/University] (b)	50	---	---	0.380	0.630
Door: Insulated Metal, Swinging, [Bldg. Use 1 - School/University]	93	---	---	0.370	0.370
Overhead doors: Insulated Metal, Non-Swinging, [Bldg. Use 1 - School/University]	228	---	---	0.370	0.179
Ext. Wall: Steel-Framed, 16in. o.c., [Bldg. Use 1 - School/University]	958	16.0	10.0	0.054	0.055
Window: Metal Frame with Thermal Break: Fixed, Perf. Specs.: Product ID KAWNEER TRIFAB 450T, SHGC 0.20, [Bldg. Use 1 - School/University] (b)	443	---	---	0.380	0.360
WEST					
Ext. Wall: Solid Concrete, 8in. Thickness, Normal Density, Furring: None, [Bldg. Use 1 - School/University]	7900	---	24.0	0.039	0.090
Window: Metal Frame with Thermal Break: Fixed, Perf. Specs.: Product ID KAWNEER TRIFAB 450T, SHGC 0.20, [Bldg. Use 1 - School/University] (b)	1365	---	---	0.380	0.360
Door: Glass (over 50 9.56976e-315lazing): Metal Frame, Entrance Door, Perf. Specs.: Product ID KAWNEER 500 WIDE STILE, SHGC 0.20, [Bldg. Use 1 - School/University] (b)	48	---	---	0.380	0.630
Ext. Wall: Solid Concrete, 10in. Thickness, Normal Density, Furring: None, [Bldg. Use 1 - School/University]	6191	---	24.0	0.039	0.090
Window: Metal Frame with Thermal Break: Fixed, Perf. Specs.: Product ID KAWNEER TRIFAB 450T, SHGC 0.20, [Bldg. Use 1 - School/University] (b)	843	---	---	0.380	0.360
Door: Glass (over 50 9.56976e-315lazing): Metal Frame, Entrance Door, Perf. Specs.: Product ID KAWNEER 500 WIDE STILE, SHGC 0.20, [Bldg. Use 1 - School/University] (b)	100	---	---	0.380	0.630

- (a) Budget U-factors are used for software baseline calculations ONLY, and are not code requirements.
- (b) Fenestration product performance must be certified in accordance with NFRC and requires supporting documentation.
- (c) Slab-On-Grade proposed and budget U-factors shown in table are F-factors.

Envelope PASSES: Design 21% better than code

Envelope Compliance Statement

Compliance Statement: The proposed envelope design represented in this document is consistent with the building plans, specifications, and other calculations submitted with this permit application. The proposed envelope systems have been designed to meet the 2021 IECC requirements in COMcheck Version COMcheckWeb and to comply with any applicable mandatory requirements listed in the Inspection Checklist.

Name - Title

Signature

Date



Interior Lighting Compliance Certificate

Project Information

Energy Code: 2021 IECC
 Project Title: CCSD Middle School - Nibley
 Project Type: New Construction

Construction Site: 3050 s 920 w
 Nibley, Utah
 Owner/Agent:
 Designer/Contractor:

Additional Efficiency Package(s)

Credits: 10.0 Required 44.0 Proposed
 Reduced lighting power, 39.0 credit
 Enhanced digital lighting controls, 2.0 credit
 Energy monitoring, 3.0 credit

Allowed Interior Lighting Power

A Area Category	B Floor Area (ft2)	C Allowed Watts / ft2	D Allowed Watts
1-School/University	160630	0.72	115654
Total Allowed Watts =			115654

Proposed Interior Lighting Power

A Fixture ID : Description / Lamp / Wattage Per Lamp / Ballast	B Lamps/ Fixture	C # of Fixture	D Fixture Watt.	E (C X D)
<u>1-School/University</u>				
LED: DR1: DOWNLIGHT: Other:	1	45	15	675
LED: DR2: DOWNLIGHT: Other:	1	12	15	180
LED: DR3: DOWNLIGHT: Other:	1	14	10	140
LED: DR4: DOWNLIGHT: Other:	1	7	20	140
LED: DR6: DOWNLIGHT: Other:	1	8	20	160
LED: HB1: HIGH BAY: Other:	1	39	15	585
LED: LP1: LINEAR PENDANT: Other:	1	1000	7	7000
LED: LP1: LINEAR PENDANT: Other:	1	36	7	252
LED: LP2: LINEAR PENDANT: Other:	1	236	7	1652
LED: LP3: LINEAR PENDANT: Other:	1	39	7	273
LED: LP4: LINEAR PENDANT: Other:	1	154	7	1078
LED: LR1: LINEAR RECESSED: Other:	1	160	9	1440
LED: LR2: LINEAR RECESSED: Other:	1	78	5	390
LED: LR3: LINEAR RECESSED: Other:	1	698	8	5584
LED: LR4: LINEAR RECESSED: Other:	1	37	8	296
LED: LS1: LINEAR SURFACE: Other:	1	36	5	180
LED: LS2: LINEAR SURFACE: Other:	1	288	40	11520
LED: LS3: LINEAR SURFACE: Other:	1	30	4	120
LED: LS4: LINEAR SURFACE: Other:	1	961	8	7688
LED: LS5: LINEAR SURFACE: Other:	1	24	8	192
LED: LW1: LINEAR WALL: Other:	1	12	13	156



Exterior Lighting Compliance Certificate

Project Information

Energy Code: 2021 IECC
 Project Title: CCSD Middle School - Nibley
 Project Type: New Construction
 Exterior Lighting Zone 2 (Residential mixed use area (LZ2))

Construction Site: 3050 s 920 w
 Nibley, Utah
 Owner/Agent:
 Designer/Contractor:

Allowed Exterior Lighting Power

A Area/Surface Category	B Quantity	C Allowed Watts /	D Tradable Wattage	E Allowed Watts (B X C)
Entry canopy	6720 ft2	0.25	Yes	1680
Parking area	148336 ft2	0.04	Yes	5933
Walkway < 10 feet wide	1117 ft of	0.5	Yes	558
Total Tradable Watts (a) =				8172
Total Allowed Watts =				8172
Total Allowed Supplemental Watts (b) =				400

(a) Wattage tradeoffs are only allowed between tradable areas/surfaces.

(b) A supplemental allowance equal to 400 watts may be applied toward compliance of both non-tradable and tradable areas/surfaces.

Proposed Exterior Lighting Power

A Fixture ID : Description / Lamp / Wattage Per Lamp / Ballast	B Lamps/ Fixture	C # of Fixture	D Fixture Watt.	E (C X D)
<u>Entry canopy (6720 ft2): Tradable Wattage</u>				
LED: DR5: CANOPY DOWNLIGHT: Other:	1	29	15	435
LED: WP2: WALL PACK: Other:	1	14	30	420
<u>Parking area (148336 ft2): Tradable Wattage</u>				
LED: AP1: AREA POLE: Other:	1	5	185	925
LED: AP2: AREA POLE: Other:	1	14	185	2590
LED: AP3: AREA POLE: Other:	1	2	185	370
LED: AP4: AREA POLE: Other:	1	1	185	185
LED: WP1: WALL PACK: Other:	1	11	50	550
<u>Walkway < 10 feet wide (1117 ft of walkway length): Tradable Wattage</u>				
LED: AB1: BOLLARD: Other:	1	12	20	240
LED: AP5: AREA POLE: Other:	1	4	65	260
LED: SC3: WALL SCONCE: Other:	1	6	10	60
LED: WP1: WALL SCONCE: Other:	1	9	20	180
Total Tradable Proposed Watts =				6215

Exterior Lighting Compliance Statement

Compliance Statement: The proposed exterior lighting design represented in this document is consistent with the building plans, specifications, and other calculations submitted with this permit application. The proposed exterior lighting systems have been designed to meet the 2021 IECC requirements in COMcheck Version COMcheckWeb and to comply with any applicable mandatory requirements listed in the Inspection Checklist.

Name - Title

Signature

Date



COMcheck Software Version COMcheckWeb Mechanical Compliance Certificate

Project Information

Energy Code: 2021 IECC
Project Title: CCSD Middle School - Nibley
Location: Nibley (Cache), Utah
Climate Zone: 5b
Project Type: New Construction

Construction Site: 3050 s 920 w
Nibley, Utah
Owner/Agent:
Designer/Contractor:

Additional Efficiency Package(s)

Credits: 10.0 Required 44.0 Proposed
Reduced lighting power, 39.0 credit
Enhanced digital lighting controls, 2.0 credit
Energy monitoring, 3.0 credit

Mechanical Systems List

Quantity System Type & Description

- 2 MAU-1 & 2 (Single Zone):
Heating: 1 each - Other, Gas, Capacity = 264 kBtu/h
No minimum efficiency requirement applies
Cooling: 1 each - DX DOAS (Dehumidification), Capacity Unknown, Evaporatively Cooled Condenser, Unknown Economizer
No minimum efficiency requirement applies
Fan System: MAU | Kitchen -- Compliance (Motor nameplate HP and fan efficiency method) : Passes
Fans:
SF-MAU-1,2 Supply, Constant Volume, 2981 CFM, 1.5 motor nameplate hp, 1.10 fan energy index
EF-MAU-1,2 Exhaust, Constant Volume, 3400 CFM, 1.5 motor nameplate hp, 1.10 fan energy index
- 1 RTU-1 (Multiple-Zone):
Heating: 1 each - Hydronic or Steam Coil, Hot Water, Capacity = 451 kBtu/h
No minimum efficiency requirement applies
Cooling: 1 each - Hydronic Coil, Capacity = 993 kBtu/h, Air Economizer
No minimum efficiency requirement applies
Fan System: RTU-1 | Classrooms A,B -- Compliance (Brake HP and fan efficiency method) : Passes
Fans:
SF-RTU-1.3 Supply, Multi-Zone VAV, 5401 CFM, 6.6 motor nameplate hp, 4.5 design brake hp (4.5 max. BHP), 1.30 fan energy index
SF-RTU-1.5 Supply, Multi-Zone VAV, 5401 CFM, 6.6 motor nameplate hp, 4.5 design brake hp (4.5 max. BHP), 1.30 fan energy index
RF-RTU-1.5 Return, Multi-Zone VAV, 5167 CFM, 3.0 motor nameplate hp, 1.7 design brake hp (1.7 max. BHP), 0.95 fan energy index
RF-RTU-1.4 Return, Multi-Zone VAV, 5167 CFM, 3.0 motor nameplate hp, 1.7 design brake hp (1.7 max. BHP), 0.95 fan energy index
RF-RTU-1.3 Return, Multi-Zone VAV, 5167 CFM, 3.0 motor nameplate hp, 1.7 design brake hp (1.7 max. BHP), 0.95 fan energy index
RF-RTU-1.2 Return, Multi-Zone VAV, 5167 CFM, 3.0 motor nameplate hp, 1.7 design brake hp (1.7 max. BHP), 0.95 fan energy index
RF-RTU-1.1 Return, Multi-Zone VAV, 5167 CFM, 3.0 motor nameplate hp, 1.7 design brake hp (1.7 max. BHP), 0.95 fan energy index
SF-RTU-1.4 Supply, Multi-Zone VAV, 5401 CFM, 6.6 motor nameplate hp, 4.5 design brake hp (4.5 max. BHP), 1.30 fan energy index
RF-RTU-1.6 Return, Multi-Zone VAV, 5167 CFM, 3.0 motor nameplate hp, 1.7 design brake hp (1.7 max. BHP), 0.95 fan energy index
SF-RTU-1.1 Supply, Multi-Zone VAV, 5401 CFM, 6.6 motor nameplate hp, 4.5 design brake hp (4.5 max. BHP), 1.30 fan energy index

Quantity System Type & Description

SF-RTU-1.2 Supply, Multi-Zone VAV, 5401 CFM, 6.6 motor nameplate hp, 4.5 design brake hp (4.5 max. BHP), 1.30 fan energy index
SF-RTU-1.6 Supply, Multi-Zone VAV, 5401 CFM, 6.6 motor nameplate hp, 4.5 design brake hp (4.5 max. BHP), 1.30 fan energy index

1 RTU-2 (Multiple-Zone):

Heating: 1 each - Hydronic or Steam Coil, Hot Water, Capacity = 692 kBtu/h

No minimum efficiency requirement applies

Cooling: 1 each - Hydronic Coil, Capacity = 1131 kBtu/h, Air Economizer

No minimum efficiency requirement applies

Fan System: RTU-2 | Classrooms A,B -- Compliance (Brake HP and fan efficiency method) : Passes

Fans:

RF-RTU-2.1 Return, Multi-Zone VAV, 6921 CFM, 3.0 motor nameplate hp, 1.9 design brake hp (1.9 max. BHP), 1.53 fan energy index

SF-RTU-2.1 Supply, Multi-Zone VAV, 7441 CFM, 10.0 motor nameplate hp, 6.9 design brake hp (6.9 max. BHP), 1.17 fan energy index

SF-RTU-2.2 Supply, Multi-Zone VAV, 7441 CFM, 10.0 motor nameplate hp, 6.9 design brake hp (6.9 max. BHP), 1.17 fan energy index

SF-RTU-2.3 Supply, Multi-Zone VAV, 7441 CFM, 10.0 motor nameplate hp, 6.9 design brake hp (6.9 max. BHP), 1.17 fan energy index

SF-RTU-2.4 Supply, Multi-Zone VAV, 7441 CFM, 10.0 motor nameplate hp, 6.9 design brake hp (6.9 max. BHP), 1.17 fan energy index

SF-RTU-2.5 Supply, Multi-Zone VAV, 7441 CFM, 10.0 motor nameplate hp, 6.9 design brake hp (6.9 max. BHP), 1.17 fan energy index

RF-RTU-2.5 Return, Multi-Zone VAV, 6921 CFM, 3.0 motor nameplate hp, 1.9 design brake hp (1.9 max. BHP), 1.53 fan energy index

RF-RTU-2.4 Return, Multi-Zone VAV, 6921 CFM, 3.0 motor nameplate hp, 1.9 design brake hp (1.9 max. BHP), 1.53 fan energy index

RF-RTU-2.2 Return, Multi-Zone VAV, 6921 CFM, 3.0 motor nameplate hp, 1.9 design brake hp (1.9 max. BHP), 1.53 fan energy index

RF-RTU-2.3 Return, Multi-Zone VAV, 6921 CFM, 3.0 motor nameplate hp, 1.9 design brake hp (1.9 max. BHP), 1.53 fan energy index

1 RTU-3 (Multiple-Zone):

Heating: 1 each - Hydronic or Steam Coil, Hot Water, Capacity = 703 kBtu/h

No minimum efficiency requirement applies

Cooling: 1 each - Hydronic Coil, Capacity = 1064 kBtu/h, Air Economizer

No minimum efficiency requirement applies

Fan System: RTU-3 | Classrooms C -- Compliance (Brake HP and fan efficiency method) : Passes

Fans:

RF-RTU-3.5 Return, Multi-Zone VAV, 6392 CFM, 3.0 motor nameplate hp, 1.7 design brake hp (1.7 max. BHP), 1.60 fan energy index

RF-RTU-3.4 Return, Multi-Zone VAV, 6392 CFM, 3.0 motor nameplate hp, 1.7 design brake hp (1.7 max. BHP), 1.60 fan energy index

RF-RTU-3.3 Return, Multi-Zone VAV, 6392 CFM, 3.0 motor nameplate hp, 1.7 design brake hp (1.7 max. BHP), 1.60 fan energy index

SF-RTU-3.5 Supply, Multi-Zone VAV, 6941 CFM, 10.0 motor nameplate hp, 6.3 design brake hp (6.3 max. BHP), 1.18 fan energy index

RF-RTU-3.1 Return, Multi-Zone VAV, 6392 CFM, 3.0 motor nameplate hp, 1.7 design brake hp (1.7 max. BHP), 1.60 fan energy index

RF-RTU-3.2 Return, Multi-Zone VAV, 6392 CFM, 3.0 motor nameplate hp, 1.7 design brake hp (1.7 max. BHP), 1.60 fan energy index

SF-RTU-3.1 Supply, Multi-Zone VAV, 6941 CFM, 10.0 motor nameplate hp, 6.3 design brake hp (6.3 max. BHP), 1.18 fan energy index

SF-RTU-3.2 Supply, Multi-Zone VAV, 6941 CFM, 10.0 motor nameplate hp, 6.3 design brake hp (6.3 max. BHP), 1.18 fan energy index

SF-RTU-3.3 Supply, Multi-Zone VAV, 6941 CFM, 10.0 motor nameplate hp, 6.3 design brake hp (6.3 max. BHP), 1.18 fan energy index

SF-RTU-3.4 Supply, Multi-Zone VAV, 6941 CFM, 10.0 motor nameplate hp, 6.3 design brake hp (6.3 max. BHP), 1.18 fan energy index

1 RTU-4 (Multiple-Zone):

Heating: 1 each - Hydronic or Steam Coil, Hot Water, Capacity = 579 kBtu/h

No minimum efficiency requirement applies

Cooling: 1 each - Hydronic Coil, Capacity = 721 kBtu/h, Air Economizer

No minimum efficiency requirement applies

Fan System: RTU-4 | Cafetorium -- Compliance (Brake HP and fan efficiency method) : Passes

Fans:

Quantity System Type & Description

RF-RTU-4.5 Return, Multi-Zone VAV, 4209 CFM, 2.0 motor nameplate hp, 1.3 design brake hp (1.3 max. BHP), 1.44 fan energy index
RF-RTU-4.4 Return, Multi-Zone VAV, 4209 CFM, 2.0 motor nameplate hp, 1.3 design brake hp (1.3 max. BHP), 1.44 fan energy index
RF-RTU-4.3 Return, Multi-Zone VAV, 4209 CFM, 2.0 motor nameplate hp, 1.3 design brake hp (1.3 max. BHP), 1.44 fan energy index
RF-RTU-4.1 Return, Multi-Zone VAV, 4209 CFM, 2.0 motor nameplate hp, 1.3 design brake hp (1.3 max. BHP), 1.44 fan energy index
RF-RTU-4.2 Return, Multi-Zone VAV, 4209 CFM, 2.0 motor nameplate hp, 1.3 design brake hp (1.3 max. BHP), 1.44 fan energy index
SF-RTU-4.4 Supply, Multi-Zone VAV, 4248 CFM, 6.6 motor nameplate hp, 3.6 design brake hp (3.6 max. BHP), 1.38 fan energy index
SF-RTU-4.5 Supply, Multi-Zone VAV, 4248 CFM, 6.6 motor nameplate hp, 3.6 design brake hp (3.6 max. BHP), 1.38 fan energy index
SF-RTU-4.1 Supply, Multi-Zone VAV, 4248 CFM, 6.6 motor nameplate hp, 3.6 design brake hp (3.6 max. BHP), 1.38 fan energy index
SF-RTU-4.3 Supply, Multi-Zone VAV, 4248 CFM, 6.6 motor nameplate hp, 3.6 design brake hp (3.6 max. BHP), 1.38 fan energy index
SF-RTU-4.2 Supply, Multi-Zone VAV, 4248 CFM, 6.6 motor nameplate hp, 3.6 design brake hp (3.6 max. BHP), 1.38 fan energy index

1 RTU-5 (Multiple-Zone):

Heating: 1 each - Hydronic or Steam Coil, Hot Water, Capacity = 284 kBtu/h

No minimum efficiency requirement applies

Cooling: 1 each - Hydronic Coil, Capacity = 935 kBtu/h, Air Economizer

No minimum efficiency requirement applies

Fan System: RTU-5 | Kitchen -- Compliance (Brake HP and fan efficiency method) : Passes

Fans:

SF-RTU-5.1 Supply, Constant Volume, 3290 CFM, 5.0 motor nameplate hp, 2.6 design brake hp (2.6 max. BHP), 1.41 fan energy index

RF-RTU-5.1 Return, Constant Volume, 3000 CFM, 1.5 motor nameplate hp, 0.8 design brake hp (0.8 max. BHP), 1.78 fan energy index

1 RTU-6 (Multiple-Zone):

Heating: 1 each - Hydronic or Steam Coil, Hot Water, Capacity = 190 kBtu/h

No minimum efficiency requirement applies

Cooling: 1 each - Hydronic Coil, Capacity = 279 kBtu/h, Air Economizer

No minimum efficiency requirement applies

Fan System: RTU-6 | Music -- Compliance (Brake HP and fan efficiency method) : Passes

Fans:

RF-RTU-6.1 Return, Multi-Zone VAV, 4403 CFM, 2.0 motor nameplate hp, 1.4 design brake hp (1.4 max. BHP), 1.41 fan energy index

RF-RTU-6.2 Return, Multi-Zone VAV, 4403 CFM, 2.0 motor nameplate hp, 1.4 design brake hp (1.4 max. BHP), 1.41 fan energy index

SF-RTU-6.2 Supply, Multi-Zone VAV, 4428 CFM, 6.6 motor nameplate hp, 3.5 design brake hp (3.5 max. BHP), 1.37 fan energy index

SF-RTU-6.1 Supply, Multi-Zone VAV, 4428 CFM, 6.6 motor nameplate hp, 3.5 design brake hp (3.5 max. BHP), 1.37 fan energy index

1 RTU-7 (Multiple-Zone):

Heating: 1 each - Hydronic or Steam Coil, Hot Water, Capacity = 764 kBtu/h

No minimum efficiency requirement applies

Cooling: 1 each - Hydronic Coil, Capacity = 263 kBtu/h, Air Economizer

No minimum efficiency requirement applies

Fan System: RTU-7 | Admin -- Compliance (Brake HP and fan efficiency method) : Passes

Fans:

RF-RTU-7.1 Return, Multi-Zone VAV, 5188 CFM, 3.0 motor nameplate hp, 1.9 design brake hp (1.9 max. BHP), 1.20 fan energy index

RF-RTU-7.2 Return, Multi-Zone VAV, 5188 CFM, 3.0 motor nameplate hp, 1.9 design brake hp (1.9 max. BHP), 1.20 fan energy index

SF-RTU-7.2 Supply, Multi-Zone VAV, 5278 CFM, 6.6 motor nameplate hp, 4.3 design brake hp (4.3 max. BHP), 1.32 fan energy index

SF-RTU-7.1 Supply, Multi-Zone VAV, 5278 CFM, 6.6 motor nameplate hp, 4.3 design brake hp (4.3 max. BHP), 1.32 fan energy index

1 RTU-8 (Multiple-Zone):

Heating: 1 each - Hydronic or Steam Coil, Hot Water, Capacity = 144 kBtu/h

No minimum efficiency requirement applies

Quantity System Type & Description

Cooling: 1 each - Hydronic Coil, Capacity = 258 kBtu/h, Air Economizer

No minimum efficiency requirement applies

Fan System: RTU-8 | Lockers / Health Classroom -- Compliance (Brake HP and fan efficiency method) : Passes

Fans:

SF-RTU-8.1 Supply, Multi-Zone VAV, 4213 CFM, 5.0 motor nameplate hp, 2.8 design brake hp (2.8 max. BHP), 1.42 fan energy index

SF-RTU-8.2 Supply, Multi-Zone VAV, 4213 CFM, 5.0 motor nameplate hp, 2.8 design brake hp (2.8 max. BHP), 1.42 fan energy index

RF-RTU-8.1 Return, Multi-Zone VAV, 2803 CFM, 1.0 motor nameplate hp, 0.6 design brake hp (0.6 max. BHP), 1.56 fan energy index

RF-RTU-8.2 Return, Multi-Zone VAV, 2803 CFM, 1.0 motor nameplate hp, 0.6 design brake hp (0.6 max. BHP), 1.56 fan energy index

1 RTU-9 (Multiple-Zone):

Heating: 1 each - Hydronic or Steam Coil, Hot Water, Capacity = 1450 kBtu/h

No minimum efficiency requirement applies

Cooling: 1 each - Hydronic Coil, Capacity = 933 kBtu/h, Air Economizer

No minimum efficiency requirement applies

Fan System: RTU-9 | Gymnasium -- Compliance (Brake HP and fan efficiency method) : Passes

Fans:

SF-RTU-9.1 Supply, Single-Zone VAV, 6000 CFM, 5.0 motor nameplate hp, 2.8 design brake hp (2.8 max. BHP), 1.50 fan energy index

SF-RTU-9.2 Supply, Single-Zone VAV, 6000 CFM, 5.0 motor nameplate hp, 2.8 design brake hp (2.8 max. BHP), 1.50 fan energy index

SF-RTU-9.3 Supply, Single-Zone VAV, 6000 CFM, 5.0 motor nameplate hp, 2.8 design brake hp (2.8 max. BHP), 1.50 fan energy index

SF-RTU-9.4 Supply, Single-Zone VAV, 6000 CFM, 5.0 motor nameplate hp, 2.8 design brake hp (2.8 max. BHP), 1.50 fan energy index

SF-RTU-9.5 Supply, Single-Zone VAV, 6000 CFM, 5.0 motor nameplate hp, 2.8 design brake hp (2.8 max. BHP), 1.50 fan energy index

RF-RTU-9.1 Return, Single-Zone VAV, 5800 CFM, 1.5 motor nameplate hp, 1.0 design brake hp (1.0 max. BHP), 1.76 fan energy index

RF-RTU-9.2 Return, Single-Zone VAV, 5800 CFM, 1.5 motor nameplate hp, 1.0 design brake hp (1.0 max. BHP), 1.76 fan energy index

RF-RTU-9.3 Return, Single-Zone VAV, 5800 CFM, 1.5 motor nameplate hp, 1.0 design brake hp (1.0 max. BHP), 1.76 fan energy index

RF-RTU-9.4 Return, Single-Zone VAV, 5800 CFM, 1.5 motor nameplate hp, 1.0 design brake hp (1.0 max. BHP), 1.76 fan energy index

RF-RTU-9.5 Return, Single-Zone VAV, 5800 CFM, 1.5 motor nameplate hp, 1.0 design brake hp (1.0 max. BHP), 1.76 fan energy index

1 RTU-10 (Multiple-Zone):

Heating: 1 each - Hydronic or Steam Coil, Hot Water, Capacity = 354 kBtu/h

No minimum efficiency requirement applies

Cooling: 1 each - Hydronic Coil, Capacity = 246 kBtu/h, Air Economizer

No minimum efficiency requirement applies

Fan System: RTU-10 | Auxiliary Gymnasium -- Compliance (Brake HP and fan efficiency method) : Passes

Fans:

SF-RTU-10.1 Supply, Single-Zone VAV, 4348 CFM, 5.0 motor nameplate hp, 2.3 design brake hp (2.3 max. BHP), 1.37 fan energy index

SF-RTU-10.2 Supply, Single-Zone VAV, 4348 CFM, 5.0 motor nameplate hp, 2.3 design brake hp (2.3 max. BHP), 1.37 fan energy index

RF-RTU-10.1 Return, Single-Zone VAV, 4348 CFM, 1.5 motor nameplate hp, 1.0 design brake hp (1.0 max. BHP), 1.02 fan energy index

RF-RTU-10.2 Return, Single-Zone VAV, 4348 CFM, 1.5 motor nameplate hp, 1.0 design brake hp (1.0 max. BHP), 1.02 fan energy index

1 CH-1:

Cooling: Water Chiller, Capacity 270 tons, Condenser Water-Cooled, Standard Centrifugal Chiller, Heat Rejection

Equipment: Propeller or Axial Fan Open-Circuit Cooling Tower

Proposed Efficiency: 0.53 kW/ton-FL, Required Efficiency: 0.61 kW/ton-FL

Proposed Part Load Efficiency: 0.41 kW/ton-IPLV, Required Part Load Efficiency: 0.55 kW/ton-IPLV

1 B-1 & 2:

Heating: Hot Water Boiler, Capacity 5000 kBtu/h, Gas

Proposed Efficiency: 87.00 % Ec, Required Efficiency: 82.00 % Ec

Quantity System Type & Description

- 1 WH-1:
Gas Instantaneous Water Heater, Capacity: 8 gallons, Input Rating: 500 kBtu/h w/ Circulation Pump
Proposed Efficiency: 84.00 % Et, Required Efficiency: 80.00 % Et

- 1 WH-2:
Gas Storage Water Heater, Capacity: 4 gallons, Input Rating: 199 kBtu/h w/ Circulation Pump
No minimum efficiency requirement applies

Mechanical Compliance Statement

Compliance Statement: The proposed mechanical design represented in this document is consistent with the building plans, specifications, and other calculations submitted with this permit application. The proposed mechanical systems have been designed to meet the 2021 IECC requirements in COMcheck Version COMcheckWeb and to comply with any applicable mandatory requirements listed in the Inspection Checklist.

Name - Title

Signature

Date



Inspection Checklist

Energy Code: 2021 IECC

Requirements: 0.0% were addressed directly in the COMcheck software

Text in the "Comments/Assumptions" column is provided by the user in the COMcheck Requirements screen. For each requirement, the user certifies that a code requirement will be met and how that is documented, or that an exception is being claimed. Where compliance is itemized in a separate table, a reference to that table is provided.

Section # & Req.ID	Plan Review	Complies?	Comments/Assumptions
C103.2 [PR1] ¹	Plans and/or specifications provide all information with which compliance can be determined for the building envelope and document where exceptions to the standard are claimed.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C103.2 [PR2] ¹	Plans, specifications, and/or calculations provide all information with which compliance can be determined for the mechanical and service water heating systems and document where exceptions to the standard are claimed. Load calculations per acceptable engineering standards and handbooks. Hot water system sized per manufacturer's sizing guide.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C103.2 [PR4] ¹	Plans, specifications, and/or calculations provide all information with which compliance can be determined for the interior lighting and electrical systems and equipment and document where exceptions to the standard are claimed. Information provided should include interior lighting power calculations, wattage of bulbs and ballasts, transformers and control devices.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C103.2 [PR8] ¹	Plans, specifications, and/or calculations provide all information with which compliance can be determined for the exterior lighting and electrical systems and equipment and document where exceptions to the standard are claimed. Information provided should include exterior lighting power calculations, wattage of bulbs and ballasts, transformers and control devices.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C402.4.1 [PR10] ¹	The vertical fenestration area <= 30 percent of the gross above-grade wall area.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C402.4.1 [PR11] ¹	The skylight area <= 3 percent of the gross roof area.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	

1 High Impact (Tier 1) 2 Medium Impact (Tier 2) 3 Low Impact (Tier 3)

Section # & Req.ID	Plan Review	Complies?	Comments/Assumptions
C402.4.2 [PR14] ¹	In enclosed spaces > 2,500 ft ² directly under a roof with ceiling heights >15 ft. and used as an office, lobby, atrium, concourse, corridor, storage, gymnasium/exercise center, convention center, automotive service, manufacturing, non-refrigerated warehouse, retail store, distribution/sorting area, transportation, or workshop, the following requirements apply: (a) the daylight zone under skylights is \geq half the floor area; (b) the skylight area to daylight zone is \geq 3 percent with a skylight VT \geq 0.40; or a minimum skylight effective aperture \geq 1 percent.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C406 [PR9] ¹	Plans, specifications, and/or calculations provide all information with which compliance can be determined for the additional energy efficiency package options.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	

Additional Comments/Assumptions:

1 High Impact (Tier 1)	2 Medium Impact (Tier 2)	3 Low Impact (Tier 3)
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Section # & Req.ID	Footing / Foundation Inspection	Complies?	Comments/Assumptions
C303.2 [FO4] ²	Slab edge insulation installed per manufacturer's instructions.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C303.2.1 [FO6] ¹	Exterior insulation protected against damage, sunlight, moisture, wind, landscaping and equipment maintenance activities.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C105 [FO3] ²	Installed slab-on-grade insulation type and R-value consistent with insulation specifications reported in plans and COMcheck reports.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	See the Envelope Assemblies table for values.
C402.2.4 [FO7] ²	Slab edge insulation depth/length. Slab insulation extending away from building is covered by pavement or >= 10 inches of soil.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	See the Envelope Assemblies table for values.
C403.13.2 , C403.13.3 [FO9] ³	Snow/ice melting system and freeze protection systems have sensors and controls configured to limit service for pavement temperature above 50F and outdoor temperature above 40F.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	

Additional Comments/Assumptions:

1	High Impact (Tier 1)	2	Medium Impact (Tier 2)	3	Low Impact (Tier 3)
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Section # & Req.ID	Framing / Rough-In Inspection	Complies?	Comments/Assumptions
C303.1.3 [FR12] ²	Fenestration products rated in accordance with NFRC certified and as to performance labels or certificates provided.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C402.4.3 [FR10] ¹	Vertical fenestration SHGC value.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	See the Envelope Assemblies table for values.
C402.4.3, C402.4.3.4 [FR8] ¹	Installed vertical fenestration U-factor and SHGC consistent with label specifications and as reported in plans and COMcheck reports.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	See the Envelope Assemblies table for values.
C402.4.5 [FR14] ²	U-factor of opaque swinging and nonswinging doors associated with the building thermal envelope meets requirements.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	See the Envelope Assemblies table for values.
C402.5.1.3 [FR19] ¹	The building envelope contains a continuous air barrier that is sealed in an approved manner and material permeability ≤ 0.004 dfm/ft ² . Air barrier penetrations are sealed in an approved manner.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C402.5.4 [FR18] ³	Factory-built fenestration and doors are labeled as meeting air leakage requirements.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	

Additional Comments/Assumptions:

1	High Impact (Tier 1)	2	Medium Impact (Tier 2)	3	Low Impact (Tier 3)
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Section # & Req.ID	Plumbing Rough-In Inspection	Complies?	Comments/Assumptions
C404.5, C404.5.1, C404.5.2 [PL6] ³	Heated water supply piping conforms to pipe length and volume requirements. Refer to section details.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C404.6.1, C404.6.2 [PL3] ¹	Automatic time switches installed to automatically switch off the recirculating hot-water system or heat trace.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C404.6.3 [PL7] ³	Pumps that circulate water between a heater and storage tank have controls that limit operation from startup to <= 5 minutes after end of heating cycle.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C404.6.1, C404.6.1.1 [PL8] ³	Demand recirculation water systems have controls that start the pump upon receiving a signal from the action of a user of a fixture or appliance and limits the temperature of the water entering the cold-water piping to 104°F.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	

Additional Comments/Assumptions:

1 High Impact (Tier 1)	2 Medium Impact (Tier 2)	3 Low Impact (Tier 3)
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Section # & Req.ID	Mechanical Rough-In Inspection	Complies?	Comments/Assumptions
C402.2.6 [ME41] ³	Thermally ineffective panel surfaces of sensible heating panels have insulation $\geq R-3.5$.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
Table_C40 3.3.2a [ME57] ¹	Heat Rejection Equipment: Minimum Efficiency Requirement ≥ 40.2 gpm/hp .	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	See the Mechanical Systems list for values.
C403.7.7 [ME58] ³	Outdoor air and exhaust systems have motorized dampers that automatically shut when not in use and meet maximum leakage rates. Check gravity dampers where allowed. Reference section language for operational details.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C403.8.1 [ME65] ³	HVAC fan systems at design conditions do not exceed allowable fan system motor nameplate hp or fan system bhp.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	See the Mechanical Systems list for values.
C403.8.2 [ME21] ²	HVAC fan motors not oversized beyond allowable limits.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C403.8.3 [ME117] ²	Fans have a fan energy index (FEI) ≥ 1.00 . Variable volume fans will have an FEI ≥ 0.95 .	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C403.8.3 [ME117] ²	Fans have a fan energy index (FEI) ≥ 1.00 . Variable volume fans will have an FEI ≥ 0.95 .	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C403.8.3 [ME117] ²	Fans have a fan energy index (FEI) ≥ 1.00 . Variable volume fans will have an FEI ≥ 0.95 .	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C403.8.3 [ME117] ²	Fans have a fan energy index (FEI) ≥ 1.00 . Variable volume fans will have an FEI ≥ 0.95 .	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C403.8.3 [ME117] ²	Fans have a fan energy index (FEI) ≥ 1.00 . Variable volume fans will have an FEI ≥ 0.95 .	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C403.8.3 [ME117] ²	Fans have a fan energy index (FEI) ≥ 1.00 . Variable volume fans will have an FEI ≥ 0.95 .	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C403.8.3 [ME117] ²	Fans have a fan energy index (FEI) ≥ 1.00 . Variable volume fans will have an FEI ≥ 0.95 .	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C403.8.3 [ME117] ²	Fans have a fan energy index (FEI) ≥ 1.00 . Variable volume fans will have an FEI ≥ 0.95 .	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	

1 High Impact (Tier 1) 2 Medium Impact (Tier 2) 3 Low Impact (Tier 3)

Section # & Req.ID	Mechanical Rough-In Inspection	Complies?	Comments/Assumptions
C403.8.3 [ME117] ²	Fans have a fan energy index (FEI) >= 1.00. Variable volume fans will have an FEI >= 0.95.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C403.8.3 [ME117] ²	Fans have a fan energy index (FEI) >= 1.00. Variable volume fans will have an FEI >= 0.95.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C403.8.3 [ME117] ²	Fans have a fan energy index (FEI) >= 1.00. Variable volume fans will have an FEI >= 0.95.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C403.8.4 [ME142] ²	Motors for fans that are not less than 1/12 hp and less than 1 hp are electronically commutated motors or have a minimum motor efficiency of 70 percent. These motors have the means to adjust motor speed.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C403.8.6 [ME143] ²	Each DX cooling system > 65 kBtu and chiller water/evaporative cooling system with fans > 1/4 hp are designed to vary the indoor fan airflow as a function of load and comply with detailed requirements of this section.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C403.9 [ME144] ²	Large diameter fans where installed shall be tested and labeled in accordance with AMCA 230.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C403.3 [ME55] ²	HVAC equipment efficiency verified.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	<i>See the Mechanical Systems list for values.</i>
C403.2.1 [ME112] ³	Zone isolation devices and controls installed where applicable.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C403.5.5 [ME113] ²	Fault detection and diagnostics installed with air-cooled unitary DX units or VRF units having economizers.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C403.2.2 [ME59] ¹	Natural or mechanical ventilation is provided in accordance with International Mechanical Code Chapter 4. Mechanical ventilation has capability to reduce outdoor air supply to minimum per IMC Chapter 4.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C403.7.1 [ME59] ¹	Demand control ventilation provided for spaces >500 ft ² and >15 people/1000 ft ² occupant density and served by systems with air side economizer, auto modulating outside air damper control, or design airflow >3,000 cfm.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C403.7.2 [ME115] ³	Enclosed parking garage ventilation has automatic contaminant detection and capacity to stage or modulate fans to 50% or less of design capacity.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	

1 High Impact (Tier 1) 2 Medium Impact (Tier 2) 3 Low Impact (Tier 3)

Section # & Req.ID	Mechanical Rough-In Inspection	Complies?	Comments/Assumptions
C403.7.3 [ME140] ³	Units that provide ventilation air to multiple zones and operate in combination with zone heating and cooling systems do not use heating or heat recovery to warm supply air to a temperature greater than 60°F when representative building loads or outdoor air temperatures indicate that the majority of zones require cooling.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C403.7.6 [ME141] ³	HVAC systems serving guestrooms in Group R-1 buildings with > 50 guestrooms: Each guestroom is provided with controls that automatically manage temperature setpoint and ventilation (see sections C403.7.6.1 and C403.7.6.2).	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C403.7.4 [ME57] ¹	Exhaust air energy recovery on systems meeting Table C403.7.4(1) and C403.7.4(2).	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C403.7.5 [ME116] ³	Kitchen exhaust systems comply with replacement air and conditioned supply air limitations, and satisfy hood rating requirements and maximum exhaust rate criteria.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C403.5, C403.5.1, C403.5.2 [ME62] ¹	Air economizers provided where required, meet the requirements for design capacity, control signal, ventilation controls, high-limit shut-off, integrated economizer control, and provide a means to relieve excess outside air during operation.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C403.5.3. 3 [ME124] ¹	Air economizers automatically reduce outdoor air intake to the design minimum outdoor air quantity when outdoor air intake will not reduce cooling energy usage. See Table C403.5.3.3 for applicable device types and climate zones.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C403.5.3. 4 [ME125] ¹	System capable of relieving excess outdoor air during air economizer operation to prevent over pressurizing the building. The relief air outlet located to avoid recirculation into the building.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C403.5.3. 5 [ME126] ¹	Return, exhaust/relief and outdoor air dampers used in economizers have motorized dampers that automatically shut when not in use and meet maximum leakage rates. Reference section C403.7.7 for details.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C403.6.1 [ME75] ²	Hydronic and multizone HVAC system controls are VAV fans driven by mechanical or electrical variable speed drive per Table C403.4.1.1.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C403.6.9 [ME67] ²	VAV fans have static pressure sensors located so controller setpoint ≤1.2 w.c..	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	

1 High Impact (Tier 1) 2 Medium Impact (Tier 2) 3 Low Impact (Tier 3)

Section # & Req.ID	Mechanical Rough-In Inspection	Complies?	Comments/Assumptions
C403.4.1.3 [ME24] ²	Reset static pressure setpoint for DDC controlled VAV boxes reporting to central controller based on the zones requiring the most pressure.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C403.4.3 [ME69] ³	The heating of fluids in hydronic systems that have been previously mechanically cooled, and the cooling of fluids that have been previously mechanically heated are limited in accordance with Sections C403.4.3.1-C403.4.3.3. Single boiler systems >500,000 Btu/h have multistaged or modulating burner.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C403.4.3.1 [ME50] ²	Three-pipe hydronic systems using a common return for hot and chilled water are not used.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C403.3.4 [ME107] ³	System turndown requirement met through multiple single-input boilers, one or more modulating boilers, or a combination of single-input and modulating boilers. Boiler input between 1.0 MBtu/h and 5 MBtu/h has 3:1 turndown ratio, boiler input between 5.0 MBtu/h and 10 MBtu/h has 4:1 turndown ratio, boiler input > 10.0 MBtu/h has 5:1 turndown ratio.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	See the Mechanical Systems list for values.
C403.4.5 [ME26] ³	Chilled water plants with multiple chillers have capability to reduce flow automatically through the chiller plant when a chiller is shut down. Boiler plants with multiple boilers have the capability to reduce flow automatically through the boiler plant when a boiler is shut down.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C403.10.1 [ME70] ³	Fan systems with total system motor capacity ≥ 5 hp associated with heat rejection equipment configured to automatically modulate the fan speed to control the leaving fluid temperature or condensing temp/pressure of heat rejection device.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C403.10.2 [ME143] ³	Multiple-cell heat rejection equipment with variable speed fan drives are controlled to operate the maximum number of fans allowed and so that all fans operate at the same fan speed required for the instantaneous cooling duty. The minimum fan speed will be the minimum allowable speed of the fan drive system in accordance with the manufacturer's recommendations.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C403.10.3 [ME108] ¹	Centrifugal fan open-circuit cooling towers having combined rated capacity ≥ 1100 gpm meets minimum efficiency requirement: ≥ 40.2 gpm/hp.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	See the Mechanical Systems list for values.

1 High Impact (Tier 1) 2 Medium Impact (Tier 2) 3 Low Impact (Tier 3)

Section # & Req.ID	Mechanical Rough-In Inspection	Complies?	Comments/Assumptions
C403.10.4 [ME109] ¹	Open-circuit cooling towers having water cooled chiller systems and multiple or variable speed condenser pumps, are designed so that tower cells can run in parallel with larger of flow criteria.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	See the Mechanical Systems list for values.
C403.6.1 [ME130] ³	Supply air systems serving multiple zones have VAV systems with controls configured to reduce the volume of air that is reheated, recooled or mixed in each zone. See section for details.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C403.6.2 [ME131] ³	Single-duct VAV systems use terminal devices configured to reduce the supply of primary supply air before reheating or recooling takes place.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C403.6.3 [ME132] ³	Systems that have 1 warm air duct and 1 cool air duct use terminal devices configured to reduce the flow from one duct to a minimum before mixing of air from the other duct takes place.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C403.6.4 [ME133] ³	Individual dual-duct or mixing heating and cooling systems with a single fan and with total capacities > 90,000 Btu/h not equipped with air economizers.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C403.6.5 [ME134] ³	Multiple zone HVAC systems have supply air temperature reset controls based on building loads or outside temperatures.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C403.6.7 [ME136] ³	Parallel-flow fan-powered VAV air terminals have automatic controls configured to 1) turn off the terminal fan except when space heating is required or where required for ventilation, 2) turn on the terminal fan as the first stage of heating before the heating coil is activated, and 3) during heating for warmup or setback temperature control, either operate the terminal fan and heating coil without primary air or, reverse the terminal damper logic and provide heating from the central air handler by primary air.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C403.6.8 [ME137] ³	Systems with DDC of individual zones reporting to the central control panel configured to reset the static pressure setpoint based on zone requiring the most pressure. The DDC is capable of monitoring zone damper positions or have an alternative method of indicating the need for static pressure. See section for details.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C403.6.9 [ME138] ³	Static pressure sensors used to control VAV fans located such that the controller setpoint is <= 1.2 inches w.c.. Where this results in one or more sensors being located downstream of major duct splits, not less than one sensor located on each major branch.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	

1 High Impact (Tier 1) 2 Medium Impact (Tier 2) 3 Low Impact (Tier 3)

Section # & Req.ID	Mechanical Rough-In Inspection	Complies?	Comments/Assumptions
C403.4.1.4 [ME63] ²	Heating for vestibules and air curtains with integral heating include automatic controls that shut off the heating system when outdoor air temperatures > 45F. Vestibule heating and cooling systems controlled by a thermostat in the vestibule with heating setpoint <= 60F and cooling setpoint >= 80F.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C403.6.6 [ME135] ³	Multiple zone VAV systems with DDC of individual zone boxes have static pressure setpoint reset controls.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	See the Mechanical Systems list for values.
C403.10.5 [ME31] ³	Condenser heat recovery system that can heat water to 85 °F or provide 60% of peak heat rejection is installed for preheating of service hot water.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C403.3.3 [ME35] ¹	Hot gas bypass limited to: <=240 kBtu/h - 50% >240 kBtu/h - 25%	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C404.2.1 [ME111] ²	Gas-fired water-heating equipment installed in new buildings: where a singular piece of water-heating equipment >= 1,000 kBtu/h serves the entire building, thermal efficiency >= 92 Et. Where multiple pieces of water-heating equipment serve the building with combined rating >= 1,000 kBtu/h, the combined input-capacity-weighted-average thermal efficiency >= 90 Et. Exclude input rating of equipment in individual dwelling units and equipment <= 100 kBtu/h.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C408.2.2.1 [ME53] ³	Air outlets and zone terminal devices have means for air balancing.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C408.2.2.2 [ME54] ³	HVAC hydronic heating and cooling coils have means to balance and have pressure test connections.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C403.11.3 , C403.11.3 .1, C403.11.3 .2 [ME123] ³	Refrigerated display cases, walk-in coolers or walk-in freezers served by remote compressors and remote condensers not located in a condensing unit, have fan-powered condensers that comply with Sections C403.11.3.1 and refrigeration compressor systems that comply with C403.11.3.2..	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	

Additional Comments/Assumptions:

1	High Impact (Tier 1)	2	Medium Impact (Tier 2)	3	Low Impact (Tier 3)
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Section # & Req.ID	Rough-In Electrical Inspection	Complies?	Comments/Assumptions
C405.2.3.1 [EL22] ¹	Spaces required to have light-reduction controls have a manual control that allows the occupant to reduce the connected lighting load in a reasonably uniform illumination pattern ≥ 50 percent.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C405.2.1, C405.2.1.1 [EL18] ¹	Occupancy sensors installed in classrooms/lecture/training rooms, conference/meeting/multipurpose rooms, copy/print rooms, lounges/breakrooms, enclosed offices, open plan office areas, restrooms, storage rooms, locker rooms, corridors, warehouse storage areas, and other spaces ≤ 300 sqft that are enclosed by floor-to-ceiling height partitions. Reference section language C405.2.1.2 for control function in warehouses and section C405.2.1.3 for open plan office spaces.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C405.2.1.2 [EL19] ¹	Occupancy sensors control function in warehouses: In warehouses, the lighting in aisleways and open areas is controlled with occupant sensors that automatically reduce lighting power by 50% or more within 20 minutes of when the areas are unoccupied. The occupant sensors control lighting in each aisleway independently and do not control lighting beyond the aisleway being controlled by the sensor. Lights not turned off by occupant sensors is done so by time-switch.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C405.2.1.3 [EL20] ¹	Occupant sensor control function in open plan office areas: Occupant sensor controls in open office spaces ≥ 300 sq.ft. have controls 1) configured so that general lighting can be controlled separately in control zones with floor areas ≤ 600 sq.ft. within the space, 2) general lighting in each zone permitted to turn on upon occupancy in control zone, 3) automatically turn off general lighting in all control zones within 20 minutes after all occupants have left the space, 4) are configured so that general lighting power in each control zone is reduced by $\geq 80\%$ of the full zone general lighting power within 20 minutes of all occupants leaving that control zone.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C405.2.2, C405.2.2.1 [EL21] ²	Each area not served by occupancy sensors (per C405.2.1.1) have time-switch controls and functions detailed in sections C405.2.2.1.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	

1 High Impact (Tier 1)
 2 Medium Impact (Tier 2)
 3 Low Impact (Tier 3)

Section # & Req.ID	Rough-In Electrical Inspection	Complies?	Comments/Assumptions
C405.2.4, C405.2.4.1, C405.2.4.2 [EL23] ²	Daylight zones provided with individual controls that control the lights independent of general area lighting. See code section C405.2.3 Daylight-responsive controls for applicable spaces, C405.2.3.1 Daylight responsive control function and section C405.2.3.2 Sidelit zone.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C405.2.5 [EL27] ¹	Additional interior lighting power allowed for special functions per the approved lighting plans and is automatically controlled and separated from general lighting.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C405.2.7 [EL28] ¹	Automatic lighting controls for exterior lighting installed. Controls will be daylight controlled, set based on business operation time-of-day, or reduce connected lighting > 30%.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C405.7 [EL26] ²	Low-voltage dry-type distribution electric transformers meet the minimum efficiency requirements of Table C405.6.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C405.8 [EL27] ²	Electric motors meet the minimum efficiency requirements of Tables C405.7(1) through C405.7(4). Efficiency verified through certification under an approved certification program or the equipment efficiency ratings shall be provided by motor manufacturer (where certification programs do not exist).	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C405.9.1, C405.9.2 [EL28] ²	Escalators and moving walks comply with ASME A17.1/CSA B44 and have automatic controls configured to reduce speed to the minimum permitted speed in accordance with ASME A17.1/CSA B44 or applicable local code when not conveying passengers.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C405.10 [EL29] ²	Total voltage drop across the combination of feeders and branch circuits ≤ 5%.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C405.1.1 [EL30] ²	At least 90% of dwelling unit permanently installed lighting shall have lamp efficacy ≥ 65 lm/W or luminaires with efficacy ≥ 45 lm/W or comply with C405.2.4 or C405.3.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C405.11, C405.11.1 [EL31] ²	50% of 15/20 amp receptacles installed in enclosed offices, conference rooms, copy rooms, break rooms, classrooms and workstations and > 25% of branch circuit feeders for modular furniture will have automatic receptacle control in accordance with C405.11.1.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	

Additional Comments/Assumptions:

1	High Impact (Tier 1)	2	Medium Impact (Tier 2)	3	Low Impact (Tier 3)
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Section # & Req.ID	Insulation Inspection	Complies?	Comments/Assumptions
C303.1 [IN3] ¹	Roof insulation installed per manufacturer's instructions and is labeled with R-value or insulation certificate providing R-value and other relevant data. Blown or poured loose-fill insulation is installed only where the roof slope is ≤ 3 in 12.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C402.2.1 [IN20] ¹	Roof assembly meets minimal thermal resistance installed between roof framing or in a continuous fashion on the roof assembly as stipulated in Table C402.1.3. Requirements for above deck insulation, minimum thickness, suspended ceilings, staggered joints and skylight curbs will be met.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C303.2 [IN7] ¹	Above-grade wall insulation installed per manufacturer's instructions.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C402.1.3 [IN19] ³	Non-swinging opaque doors have R-4.75 insulation.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C105 [IN6] ¹	Installed above-grade wall insulation type and R-value consistent with insulation specifications reported in plans and COMcheck reports.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	See the Envelope Assemblies table for values.
C402.2.3 [IN8] ²	Installed floor insulation type and R-value consistent with insulation specifications reported in plans and COMcheck reports.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	See the Envelope Assemblies table for values.
C402.2.6 [IN18] ³	Radiant panels and associated components, designed for heat transfer from the panel surfaces to the occupants or indoor space are insulated with a minimum of R-3.5.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C105 [IN2] ¹	Installed roof insulation type and R-value consistent with insulation specifications reported in plans and COMcheck reports. For some ceiling systems, verification may need to occur during Framing Inspection.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	See the Envelope Assemblies table for values.
C402.5.1.1 [IN1] ¹	All sources of air leakage in the building thermal envelope are sealed, caulked, gasketed, weather stripped or wrapped with moisture vapor-permeable wrapping material to minimize air leakage.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	

Additional Comments/Assumptions:

1	High Impact (Tier 1)	2	Medium Impact (Tier 2)	3	Low Impact (Tier 3)
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Section # & Req.ID	Final Inspection	Complies?	Comments/Assumptions
C303.3, C408.2.5.2 [FI17] ³	Furnished O&M instructions for systems and equipment to the building owner or designated representative.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C303.3, C408.2.5.3 [FI8] ³	Furnished O&M manuals for HVAC systems within 90 days of system acceptance.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C401.3 [FI58] ¹	A thermal envelope certificate will be supplied and completed by an approved third party.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C402.5.10 [FI26] ³	Recessed luminaires in thermal envelope to limit infiltration and be IC rated and labeled. Seal between interior finish and luminaire housing.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C402.5.11 [FI59] ¹	Operable openings > 40 ft ² will be interlocked with heating and cooling systems to setback setpoint temperatures within 10 minutes of opening.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C402.5.8 [FI37] ¹	Weatherseals installed on all loading dock cargo door openings and provide direct contact along the top and sides of vehicles parked in the doorway.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C403.3.1 [FI27] ³	HVAC systems and equipment capacity does not exceed calculated loads.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C403.4.1 [FI47] ³	Heating and cooling to each zone is controlled by a thermostat control. Minimum one humidity control device per installed humidification/dehumidification system.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C403.4.1.2 [FI38] ³	Thermostatic controls have a 5 °F deadband.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C403.4.1.3 [FI20] ³	Temperature controls have setpoint overlap restrictions.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C403.4.2 [FI39] ³	Each zone equipped with setback controls using automatic time clock or programmable control system.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C403.4.2.1, C403.4.2.2 [FI40] ³	Automatic Controls: Setback to 55°F (heat) and 85°F (cool); 7-day clock, 2-hour occupant override, 10-hour backup	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	

1 High Impact (Tier 1)
 2 Medium Impact (Tier 2)
 3 Low Impact (Tier 3)

Section # & Req.ID	Final Inspection	Complies?	Comments/Assumptions
C403.4.2.3 [FI41] ³	Systems include optimum start controls.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C404.3 [FI11] ³	Heat traps installed on supply and discharge piping of non-circulating systems.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C404.4 [FI25] ²	All piping insulated in accordance with section details and Table C403.12.3.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C404.6.1 [FI12] ³	Controls are installed that limit the operation of a recirculation pump installed to maintain temperature of a storage tank. System return pipe is a dedicated return pipe or a cold water supply pipe.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C405.5.1 [FI19] ¹	Exterior lighting power is consistent with what is shown on the approved lighting plans, demonstrating proposed watts are less than or equal to allowed watts.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	<i>See the Exterior Lighting fixture schedule for values.</i>
C406.3 [FI67] ¹	Reduced lighting power - this credit specifies that the connected lighting power is >= 10% more efficient than 2021 IECC requirements.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C406.4 [FI54] ¹	Enhanced Digital Lighting Controls - Interior lighting has the following enhanced lighting controls in accordance with Sections C405.2.1 through C405.2.3, Luminaires capable of continuous dimming and being addressed individually, at least 8 luminaires controlled in combination in a daylight zone, digital control system for fixtures with load shedding or occupancy sensors, Sequence of Operations documentation, and functional testing per Section C408.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C406.10 [FI63] ¹	Energy Monitoring - the building is equipped with an energy management system to monitor, record, and report energy consumption for electrical energy, by end-use category, contain meters, a data acquisition system and employ graphical reports.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C408.1.1 [FI57] ¹	Building operations and maintenance documents will be provided to the owner. Documents will cover manufacturers' information, specifications, programming procedures and means of illustrating to owner how building, equipment and systems are intended to be installed, maintained, and operated.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	

1 High Impact (Tier 1) 2 Medium Impact (Tier 2) 3 Low Impact (Tier 3)

Section # & Req.ID	Final Inspection	Complies?	Comments/Assumptions
C408.2.1 [FI28] ¹	Commissioning plan developed by registered design professional or approved agency.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C408.2.3.1 [FI31] ¹	HVAC equipment, systems and system-to-system relationships have been tested to ensure proper operation.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C408.2.3.2 [FI10] ¹	HVAC and service water heating control systems have been tested to ensure proper operation, calibration and adjustment of controls.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C408.2.3.3 [FI32] ¹	Economizers have been tested to ensure proper operation.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C408.2.4 [FI29] ¹	Preliminary commissioning report completed and certified by registered design professional or approved agency.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C408.2.5 [FI7] ³	Furnished HVAC as-built drawings submitted within 90 days of system acceptance.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C408.2.5 [FI16] ³	Furnished as-built drawings for electric power systems within 90 days of system acceptance.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C408.2.5.1 [FI43] ¹	An air and/or hydronic system balancing report is provided for HVAC systems.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C408.2.5.2 [FI30] ¹	Final commissioning report due to building owner within 90 days of receipt of certificate of occupancy.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C408.3 [FI33] ¹	Lighting systems have been tested to ensure proper calibration, adjustment, programming, and operation.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	

Additional Comments/Assumptions:

1 High Impact (Tier 1)	2 Medium Impact (Tier 2)	3 Low Impact (Tier 3)
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**SECTION 01 1000
SUMMARY**

PART 1 GENERAL

1.01 PROJECT

- A. Project Name: 123006 - CCSD Nibley Middle School
- B. Owner's Name: Cache County School District.
- C. Architect's Name: Design West Architects.
- D. The Project consists of the construction of a new school on a vacant undeveloped site..

1.02 OWNER OCCUPANCY

- A. Owner intends to occupy the Project upon Substantial Completion.
- B. Cooperate with Owner to minimize conflict and to facilitate Owner's operations.
- C. Schedule the Work to accommodate Owner occupancy.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION 01 1000

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**SECTION 01 2000
PRICE AND PAYMENT PROCEDURES**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Procedures for preparation and submittal of applications for progress payments.
- B. Correlation of CMGC Contractor submittals based on changes.

1.02 RELATED REQUIREMENTS

- A. Section 00 5000 - Contracting Forms and Supplements: Forms to be used.

1.03 SCHEDULE OF VALUES

- A. Use Schedule of Values Form: AIA G703, edition stipulated in the Agreement.
- B. Electronic media printout including equivalent information will be considered in lieu of standard form specified; submit draft to Architect for approval.
- C. Forms filled out by hand will not be accepted.

1.04 APPLICATIONS FOR PROGRESS PAYMENTS

- A. Payment Period: Submit at intervals stipulated in the Agreement.
- B. Use Form AIA G702 and Form AIA G703, edition stipulated in the Agreement.
- C. Electronic media printout including equivalent information will be considered in lieu of standard form specified; submit sample to Architect for approval.
- D. Forms filled out by hand will not be accepted.
- E. Execute certification by signature of authorized officer.
- F. Use data from approved Schedule of Values. Provide dollar value in each column for each line item for portion of work performed and for stored products.
- G. List each authorized Change Order as a separate line item, listing Change Order number and dollar amount as for an original item of work.
- H. Submit one electronic and three hard-copies of each Application for Payment.

1.05 MODIFICATION PROCEDURES

- A. Submit name of the individual authorized to receive change documents and who will be responsible for informing others in CMGC 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 CMGC Contractor .
- C. For other required changes, Architect will issue a document signed by Owner instructing CMGC Contractor to proceed with the change, for subsequent inclusion in a Change Order.
 - 1. The document will describe the required changes and will designate method of determining any change in Contract Sum or Contract Time.
 - 2. Promptly execute the change.
- 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 with a stipulation of any overtime work required and the period of time during which the requested price will be considered valid. CMGC Contractor shall prepare and submit a fixed price quotation within 5 days.
- E. CMGC 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: As specified in the Agreement and Conditions of the Contract.
- G. Substantiation of Costs: Provide full information required for evaluation.
 - 1. On request, provide the following data:
 - a. Quantities of products, labor, and equipment.
 - b. Taxes, insurance, and bonds.
 - c. Overhead and profit.
 - d. Justification for any change in Contract Time.
 - e. Credit for deletions from Contract, similarly documented.
 - 2. Support each claim for additional costs with additional information:
 - 3. For Time and Material work, submit itemized account and supporting data after completion of change, within time limits indicated in the Conditions of the Contract.
- 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.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION 01 2000

**SECTION 01 2300
ALTERNATES**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Description of Alternates.

1.02 RELATED REQUIREMENTS

- A. Document 00 2113 - Instructions to Bidders: Instructions for preparation of pricing for Alternates.

1.03 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.

1.04 SCHEDULE OF ALTERNATES

- A. Alternate No. 1 -
 - 1. Base Bid Item: 8 Classrooms in Area A South of the stair on South building end.
 - 2. Alternate Item: Removal of the footings and foundation in the area indicated on the plans. Foundation wall and footings South of Area A to be modified to support a masonry veneer per detail indicated on plans. Includes finishing exterior wall and inclusion of frames types of classrooms are removed. Applicable lockers indicated on plans are to be deducted, if classrooms are removed.
- B. Alternate No. 2 -
 - 1. Base Bid Item: Roofing membrane - Ketone Ethylene Ester (KEE) Sheet Roofing, FiberTite-SM Membrane; See Section 5400 - Thermoplastic (KEE) Membrane Roofing.
 - 2. Alternate Item: Roofing Membrane - 60 mil Carlise PVC Membrane; See Section 5419 - Single-ply PVC Membrane Roofing.

PART 2 PRODUCTS

PART 3 EXECUTION - NOT USED

END OF SECTION 01 2300

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**SECTION 01 2500
SUBSTITUTION PROCEDURES**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Procedural requirements for proposed substitutions.

1.02 DEFINITIONS

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

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 GENERAL REQUIREMENTS

- A. A Substitution Request for products, assemblies, materials, and equipment constitutes a representation that the submitter:
 - 1. Has investigated proposed product and determined that it meets or exceeds the quality level of the specified product, equipment, assembly, or system.
 - 2. Agrees to provide the same warranty for the substitution as for the specified product.
 - 3. Agrees to provide same or equivalent maintenance service and source of replacement parts, as applicable.
 - 4. Agrees to coordinate installation and make changes to other work that may be required for the work to be complete, with no additional cost to Owner.
 - 5. Waives claims for additional costs or time extension that may subsequently become apparent.
 - 6. Agrees to reimburse Owner and Architect for review or redesign services associated with re-approval by authorities.
- B. A Substitution Request for specified installer constitutes a representation that the submitter:
 - 1. Has acted in good faith to obtain services of specified installer, but was unable to come to commercial, or other terms.
- C. Document each request with complete data substantiating compliance of proposed substitution with Contract Documents. Burden of proof is on proposer.
- D. Content: Include information necessary for tracking the status of each Substitution Request, and information necessary to provide an actionable response.
 - 1. No specific form is required. CMGC Contractor 's Substitution Request documentation must include the following:
 - a. Project Information:
 - 1) Official project name and number, and any additional required identifiers established in Contract Documents.
 - b. Substitution Request Information:
 - 1) Discrete and consecutive Substitution Request number, and descriptive subject/title.
 - 2) Indication of whether the substitution is for cause or convenience.
 - 3) Issue date.
 - 4) Description of Substitution.
 - 5) Reason why the specified item cannot be provided.

- 6) Differences between proposed substitution and specified item.
- 7) Description of how proposed substitution affects other parts of work.
- c. Attached Comparative Data: Provide point-by-point, side-by-side comparison addressing essential attributes specified, as appropriate and relevant for the item:
 - 1) Physical characteristics.
 - 2) In-service performance.
 - 3) Expected durability.
 - 4) Visual effect.
 - 5) Warranties.
 - 6) Other salient features and requirements.
 - 7) Include, as appropriate or requested, the following types of documentation:
 - (a) Product Data:
 - (b) Samples.
 - (c) Certificates, test, reports or similar qualification data.
- d. Impact of Substitution:
 - 1) Savings to Owner for accepting substitution.
 - 2) Change to Contract Time due to accepting substitution.
- E. Limit each request to a single proposed substitution item.
 1. Submit an electronic document, combining the request form with supporting data into single document.

3.02 SUBSTITUTION PROCEDURES DURING PROCUREMENT

- A. Submittal Time Restrictions:
 1. Submit request for Substitution for Convenience immediately upon discovery of its potential advantage to the project, but not later than [7] days prior to time required for review and approval by Architect, in order to stay on approved bidding schedule.

3.03 SUBSTITUTION PROCEDURES DURING CONSTRUCTION

- A. Architect will consider requests for substitutions only within 15 days after date of Agreement.
- B. Submit request for Substitution for Cause within 14 days of discovery of need for substitution, but not later than 7 days prior to time required for review and approval by Architect, in order to stay on approved project schedule.
- C. Submit request for Substitution for Convenience are not permitted during construction.
- D. Substitutions will not be considered under one or more of the following circumstances:
 1. When they are indicated or implied on shop drawing or product data submittals, without having received prior approval.
 2. Without a separate written request during the bidding period.
- E. Failure to order product in a timely manner to meet project timeline requirements, does not constitute justification for a substitution. Any additional costs incurred related to obtaining the specified product in a expedited manner, as a result of this failure, will not be approved in Change Orders and are the responsibility of the ordering party.

3.04 RESOLUTION

- A. Architect may request additional information and documentation prior to rendering a decision. Provide this data in an expeditious manner.
- B. Architect will notify CMGC Contractor in writing of decision to accept or reject request.
 1. Architect's decision following review of proposed substitution will be noted on the submitted form.

3.05 ACCEPTANCE

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

3.06 CLOSEOUT ACTIVITIES

- A. See Section 01 7800 - Closeout Submittals, for closeout submittals.

END OF SECTION 01 2500

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**SECTION 01 3000
ADMINISTRATIVE REQUIREMENTS**

PART 1 GENERAL

1.01 SECTION INCLUDES

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

1.02 GENERAL ADMINISTRATIVE REQUIREMENTS

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

1.03 PROJECT COORDINATOR

- A. Project Coordinator: Construction Manager.
- B. Cooperate with the Project Coordinator in allocation of mobilization areas of site; for field offices and sheds, for access, traffic, and parking facilities.
- C. During construction, coordinate use of site and facilities through the Project Coordinator.
- D. Comply with Project Coordinator's procedures for intra-project communications; submittals, reports and records, schedules, coordination drawings, and recommendations; and resolution of ambiguities and conflicts.
- E. Comply with instructions of the Project Coordinator for use of temporary utilities and construction facilities. Responsibility for providing temporary utilities and construction facilities is identified in Section 01 1000 - Summary.
- F. Coordinate field engineering and layout work under instructions of the Project Coordinator.
- G. Make the following types of submittals to Architect through the Project Coordinator:
 - 1. Requests for Interpretation.
 - 2. Requests for substitution.
 - 3. Shop drawings, product data, and samples.
 - 4. Test and inspection reports.
 - 5. Design data.

6. Manufacturer's instructions and field reports.
7. Applications for payment and change order requests.
8. Progress schedules.
9. Coordination drawings.
10. Correction Punch List and Final Correction Punch List for Substantial Completion.
11. Closeout submittals.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 ELECTRONIC DOCUMENT SUBMITTAL SERVICE

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

3.02 PRECONSTRUCTION MEETING

- A. Project Coordinator will schedule a meeting after Notice to Proceed.
- B. Attendance Required:
 1. Owner.
 2. Architect.
 3. CMGC Contractor .
 4. Invited Sub-Contractors.
- C. Agenda:
 1. Submission of list of subcontractors, list of products, schedule of values, and progress schedule.
 2. Submission of initial Submittal schedule.
 3. Designation of personnel representing the parties to Contract, None - N/A and <1|A/E|>.
 4. Procedures and processing of field decisions, submittals, substitutions, applications for payments, proposal request, Change Orders, and Contract closeout procedures.

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

3.03 SITE MOBILIZATION MEETING

- A. Project Coordinator will schedule meeting at the Project site prior to CMGC Contractor occupancy.
- B. Attendance Required:
 1. CMGC Contractor .
 2. Architect.
 3. CMGC Contractor 's superintendent.
 4. Major subcontractors.
- C. Agenda:
 1. Use of premises by Owner and CMGC Contractor .
 2. Owner's requirements.
 3. Construction facilities and controls provided by Owner.
 4. Temporary utilities provided by Owner.
 5. Survey and building layout.
 6. Security and housekeeping procedures.
 7. Schedules.
 8. Application for payment procedures.
 9. Procedures for testing.
 10. Procedures for maintaining record documents.
 11. Requirements for start-up of equipment.
 12. Inspection and acceptance of equipment put into service during construction period.
- D. Record minutes and distribute copies within four days after meeting to participants, with copies to Architect, Owner, participants, and those affected by decisions made.

3.04 PROGRESS MEETINGS

- A. Schedule and administer meetings throughout progress of the work at maximum weekly intervals.
- B. Make arrangements for meetings, prepare agenda with copies for participants, preside at meetings.
- C. Attendance Required:
 1. CMGC Contractor .
 2. Owner.
 3. Architect.
 4. CMGC Contractor 's superintendent.
 5. Major subcontractors.
- 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. Maintenance of progress schedule.
 8. Corrective measures to regain projected schedules.
 9. Planned progress during succeeding work period.
 10. Coordination of projected progress.
 11. Maintenance of quality and work standards.
 12. Effect of proposed changes on progress schedule and coordination.
 13. Other business relating to work.

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

3.05 CONSTRUCTION PROGRESS SCHEDULE - SEE SECTION 01 3216

- A. If preliminary schedule requires revision after review, submit revised schedule within 10 days.
- B. Within 20 days after review of preliminary schedule, submit draft of proposed complete schedule for review.
 - 1. Include written certification that major contractors have reviewed and accepted proposed schedule.
- C. Within 10 days after joint review, submit complete schedule.
- D. Submit updated schedule with each Application for Payment.

3.06 PROGRESS PHOTOGRAPHS

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

3.07 COORDINATION DRAWINGS

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

3.08 REQUESTS FOR INTERPRETATION(RFI)

- A. Definition: A request seeking one of the following:
 - 1. An interpretation, amplification, or clarification of some requirement of Contract Documents arising from inability to determine from them the exact material, process, or system to be installed; or when the elements of construction are required to occupy the same space (interference); or when an item of work is described differently at more than one place in Contract Documents.
 - 2. A resolution to an issue which has arisen due to field conditions and affects design intent.
- B. Whenever possible, request clarifications at the next appropriate project progress meeting, with response entered into meeting minutes, rendering unnecessary the issuance of a formal RFI.
- C. Preparation: Prepare an RFI immediately upon discovery of a need for interpretation of Contract Documents. Failure to submit a RFI in a timely manner is not a legitimate cause for claiming additional costs or delays in execution of the work.
 - 1. Prepare a separate RFI for each specific item.
 - a. Review, coordinate, and comment on requests originating with subcontractors and/or materials suppliers.
 - b. Do not forward requests which solely require internal coordination between subcontractors.
 - 2. Prepare using an electronic version of the form appended to this section.
 - 3. Prepare using software provided by the Electronic Document Submittal Service.
 - 4. Combine RFI and its attachments into a single electronic file. PDF format is preferred.
- D. Reason for the RFI: Prior to initiation of an RFI, carefully study all Contract Documents to confirm that information sufficient for their interpretation is definitely not included.
- E. Content: Include identifiers necessary for tracking the status of each RFI, and information necessary to provide an actionable response.

1. Official Project name and number, and any additional required identifiers established in Contract Documents.
 2. Owner's, Architect's, and CMGC Contractor 's names.
 3. Discrete and consecutive RFI number, and descriptive subject/title.
 4. Issue date, and requested reply date.
 5. Reference to particular Contract Document(s) requiring additional information/interpretation. Identify pertinent drawing and detail number and/or specification section number, title, and paragraph(s).
 6. Annotations: Field dimensions and/or description of conditions which have engendered the request.
 7. CMGC Contractor 's suggested resolution: A written and/or a graphic solution, to scale, is required in cases where clarification of coordination issues is involved, for example; routing, clearances, and/or specific locations of work shown diagrammatically in Contract Documents. If applicable, state the likely impact of the suggested resolution on Contract Time or the Contract Sum.
- F. Attachments: Include sketches, coordination drawings, descriptions, photos, submittals, and other information necessary to substantiate the reason for the request.
- G. RFI Log: Prepare and maintain a tabular log of RFIs for the duration of the project.
1. Indicate current status of every RFI. Update log promptly and on a regular basis.
 2. Note dates of when each request is made, and when a response is received.
 3. Highlight items requiring priority or expedited response.
 4. Highlight items for which a timely response has not been received to date.
 5. Identify and include improper or frivolous RFIs.
- H. Review Time: Architect will respond and return RFIs to CMGC Contractor within seven calendar days of receipt. For the purpose of establishing the start of the mandated response period, RFIs received after 12:00 noon will be considered as having been received on the following regular working day.
1. Response period may be shortened or lengthened for specific items, subject to mutual agreement, and recorded in a timely manner in progress meeting minutes.
- I. Responses: Content of answered RFIs will not constitute in any manner a directive or authorization to perform extra work or delay the project. If in CMGC Contractor 's belief it is likely to lead to a change to Contract Sum or Contract Time, promptly issue a notice to this effect, and follow up with an appropriate Change Order request to Owner.
1. Response may include a request for additional information, in which case the original RFI will be deemed as having been answered, and an amended one is to be issued forthwith. Identify the amended RFI with an R suffix to the original number.
 2. Do not extend applicability of a response to specific item to encompass other similar conditions, unless specifically so noted in the response.
 3. Upon receipt of a response, promptly review and distribute it to all affected parties, and update the RFI Log.
 4. Notify Architect within seven calendar days if an additional or corrected response is required by submitting an amended version of the original RFI, identified as specified above.

3.09 SUBMITTAL SCHEDULE

- A. Submit to Architect for review a schedule for submittals in tabular format.
1. Format schedule to allow tracking of status of submittals throughout duration of construction.
 2. Arrange information to include scheduled date for initial submittal, specification number and title, submittal category (for review or for information), description of item of work covered, and role and name of subcontractor.
 3. Account for time required for preparation, review, manufacturing, fabrication and delivery when establishing submittal delivery and review deadline dates.
 - a. For assemblies, equipment, systems comprised of multiple components and/or requiring detailed coordination with other work, allow for additional time to make

corrections or revisions to initial submittals, and time for their review.

3.10 SUBMITTALS FOR REVIEW

- A. When the following are specified in individual sections, submit them for review:
 - 1. Product data.
 - 2. Shop drawings.
 - 3. Samples for selection.
 - 4. Samples for verification.
- B. Submit to Architect for review for the limited purpose of checking for compliance with information given and the design concept expressed in Contract Documents.
- C. Samples will be reviewed for aesthetic, color, or finish selection.
- D. After review, provide copies and distribute in accordance with SUBMITTAL PROCEDURES article below and for record documents purposes described in Section 01 7800 - Closeout Submittals.

3.11 SUBMITTALS FOR INFORMATION

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

3.12 SUBMITTALS FOR PROJECT CLOSEOUT

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

3.13 NUMBER OF COPIES OF SUBMITTALS

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

3.14 SUBMITTAL PROCEDURES

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

4. Apply CMGC 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 CMGC Contractor , or without CMGC Contractor 's stamp will not be acknowledged, reviewed, or returned.
 5. Deliver each submittal on date noted in submittal schedule, unless an earlier date has been agreed to by all affected parties, and is of the benefit to the project.
 - a. Upload submittals in electronic form to Electronic Document Submittal Service website.
 6. Schedule submittals to expedite the Project, and coordinate submission of related items.
 - a. For each submittal for review, allow 15 days excluding delivery time to and from the CMGC Contractor .
 - b. For sequential reviews involving Architect's consultants, Owner, or another affected party, allow an additional 7 days.
 7. Identify variations from Contract Documents and product or system limitations that may be detrimental to successful performance of the completed work.
 8. Provide space for CMGC Contractor and Architect review stamps.
 9. When revised for resubmission, identify all changes made since previous submission.
 10. Incomplete submittals will not be reviewed, unless they are partial submittals for distinct portion(s) of the work, and have received prior approval for their use.
 11. Submittals not requested will be recognized, and will be returned "Not Reviewed",
- B. Product Data Procedures:
1. Submit only information required by individual specification sections.
 2. Collect required information into a single submittal.
 3. Submit concurrently with related shop drawing submittal.
 4. Do not submit (Material) Safety Data Sheets for materials or products.
- C. Shop Drawing Procedures:
1. Prepare accurate, drawn-to-scale, original shop drawing documentation by interpreting Contract Documents and coordinating related work.
 2. Generic, non-project-specific information submitted as shop drawings do not meet the requirements for shop drawings.
- D. Samples Procedures:
1. Transmit related items together as single package.
 2. Identify each item to allow review for applicability in relation to shop drawings showing installation locations.

3.15 SUBMITTAL REVIEW

- A. Submittals for Review: Architect will review each submittal, and approve, or take other appropriate action.
- B. Submittals for Information: Architect will acknowledge receipt and review. See below for actions to be taken.
- C. Architect's actions will be reflected by marking each returned submittal using virtual stamp on electronic submittals.
- D. Architect's and consultants' actions on items submitted for review:
 1. Authorizing purchasing, fabrication, delivery, and installation:
 - a. "Approved as Noted, Resubmission not required", or language with same legal meaning.
 - 1) At CMGC Contractor 's option, submit corrected item, with review notations acknowledged and incorporated.
 - b. "Approved as Noted, Resubmit for Record", or language with same legal meaning.
 2. Not Authorizing fabrication, delivery, and installation:
 - a. "Revise and Resubmit".
 - 1) Resubmit revised item, with review notations acknowledged and incorporated.

- b. "Rejected".
 - 1) Submit item complying with requirements of Contract Documents.
- E. Architect's and consultants' actions on items submitted for information:
 - 1. Items for which no action was taken:
 - a. "Received" - to notify the CMGC Contractor that the submittal has been received for record only.
 - 2. Items for which action was taken:
 - a. "Reviewed" - no further action is required from CMGC Contractor .

END OF SECTION 01 3000

SECTION 01 3529
HEALTH, SAFETY, AND EMERGENCY RESPONSE PROCEDURES
SEE ATTACHED NOTICE FROM CMGC
END OF SECTION 01 3529

DWA Construction, Inc.

Safety and Health Policy

Effective Date
9/14/2016

DWA Safety and Health Mission Statement

We are committed to providing a healthy and safe work environment for all who work on or visit our project sites. Our most valuable asset is our employees and the employees of the companies that contract with us.

We endeavor to discover and eliminate unsafe conditions and minimize safety and health related risks by identifying hazards and developing safe work practices and promoting safety awareness. DWA Construction furnishes necessary tools and protective equipment, to its employees and provides employee training in the proper use of safety equipment and personal protective equipment. We work closely with OSHA, Workman's Compensation Fund and various safety services and training entities. We strive to protect our employees, visitors and all associated property by promoting a culture of shared responsibility. The open exchange of suggestions, ideas and concerns is encouraged.

All contractors are expected to adopt of an aggressive safety policy addressing the risks pertaining to the safety and health hazards associated with their trades. All contracted companies are expected to familiarize their employees with the DWA safety and health policy, expectations of DWA management and OSHA regulations and disciplinary actions associated with disregard to any safety or health requirement, whether addressed in the DWA safety policy, OSHA regulations or regulations imposed by the owner.

OBJECTIVE

DWA Construction, owners and management, are committed to working as a cohesive team with the company Safety Manager, Utah Occupational Safety and Health Administration (consultation and enforcement), to cultivate and maintain an attitude of safety awareness. The goal of DWA Construction is to provide a safe work environment for all who enter the work site. This is accomplished through ongoing training and encouragement to develop and use safe and effective work practices.

This policy is derived from, and at a minimum, complies with Federal OSHA and UOSHA 1910 and 1926 Standards and Rules. The Policy may also include specific requirements as a condition for employment or contract work with DWA Construction. Company management reserves the right to modify this policy at will, and without prior notification, in order to best assure the safety and wellness of all who enter the job site. Modifications may be jobsite or task specific and have no effect on other jobsites.

DWA Construction honors and complies with the rules and policies of owners, contracted companies and governing agencies that are working in partnership to complete a project. Rules and policies, or parts thereof, will be enforced so long as they are at least as stringent as this policy.

The purpose and intent of this policy is to take every step necessary to help prevent an accident or illness from affecting the lives of all employees on our projects. DWA Construction is concerned with the safety and well being of our employees, contractor employees, customers and visitors as well as the prevention of wasteful, inefficient work procedures, or damage to property and equipment.

APPLICABILITY

This Safety Policy applies to anyone who enters the project property. The authorization and responsibility for enforcement has been assigned to the Safety Manager. The Superintendents are accountable for the safe actions of all employees on the project.

- a. Employees of DWA Construction, regardless of their position.
- b. Contract employees and contract company owners and managers.
- c. Individuals representing the owner, architect, engineering firms and inspectors thereof.
- d. Delivery drivers are included and are the responsibility of the appropriate contractor.
- e. Visitors, whether invited or accidental

RESPONSIBILITY

1. DWA Safety Manager

- a. Design, implement and train all employees and supervisors on all safety and health plans and rules.
- b. Resolve, with the advice of company owners and Superintendents, all safety or health rule and violation disputes.
- c. Assist the Superintendents in training and enforcement of safety rules.
- d. Has the authority to shutdown any operation or action of an individual or contracted company. The Safety Manager also has the authority to demand the removal of any individual or company from the premises.
- e. Has the authority to impose any justifiable disciplinary action or impose any requirement for restoration of permission to work on any DWA Construction project.
- f. Will work with all supervisors to reduce safety exposure on the job site.
- g. Meet with the Project Managers and Superintendents weekly to evaluate the effectiveness of safety and health plans and programs. Awareness of changes will be the responsibility of each individual whether a direct employee or contracted employee or company.

2. DWA Construction Superintendents and Supervisors

- a. Oversee all aspects of the daily safety and health of all who enter a project.
- b. Watch for and correct unsafe work practices or procedures. Provide on-the-spot training when necessary. Report to the Safety Manager the need for comprehensive training on the company level. Report the apparent lack of training for contracted employees.
- c. **Enforce all DWA Construction and OSHA rules and regulations.**
- d. Report all accidents and near miss accidents to the Safety Manager.
- e. Conduct weekly onsite safety meetings and report attendance to the office.
- f. Report unsafe conditions to the Safety Manager.
- g. Report to the Safety Manager the need of additional safety equipment.

3. Companies contracting to work with/for DWA Construction

- a. Provide a competent supervisor of authority to oversee all aspects of the daily safety and health of their employees. The supervisor and each of their employees must be able to provide verification of safety training as required by OSHA for the task they are performing.
- b. Provide all safety equipment required for their employees to work in compliance with this policy and OSHA requirements. This equipment shall include hardhats, safety glasses, hearing protection, fall protection equipment, **ladders and other equipment needed for elevated work** and any other equipment that is required for safe work. Dust masks and appropriate training in their use will be provided by the contract employer.
- c. Provide weekly safety meetings and training for their employees. Provide verification and attendance records of these meetings when requested by the Safety Manager. Provide onsite training of employees as needed.
- d. Submit to the DWA Construction Superintendent copies of certifications as required by federal or state law or federal or state OSHA regulations. This will include equipment operators, welders, electricians and anyone who requires special training and certification, either by OSHA or state law.

- e. **Employees and supervisors agree to abide by the requirements of the Superintendent or Safety Manager, whether verbal or written.**

ACKNOWLEDGEMENT of POLICY

Ignorance of any part of this policy or OSHA rules or regulations will *not* be accepted as a reason for noncompliance. It is the responsibility of each individual and subcontracting company to become knowledgeable with the requirements for each task performed and the requirements of each project and owner. It is the sincere desire of company management to provide clarification to any employee as required:

- a. Copies of this policy may be obtained at the project office or the DWA Construction office.
- b. This policy should be reviewed before contractual agreements are made. Acceptance of employment, direct or contracted, will by an assumption of agreement to comply with this policy and any DWA Construction safety rules or safety requests.
- c. Training will be provided to new DWA Construction employees and ongoing jobsite training will be provided when an unsafe practice is observed. Contractors are expected to provide similar training. Repetition of similar violations by an individual or company demonstrates an unwillingness to comply with this policy which may result in disciplinary action of the individual, foreman and/or contracted company.
- d. Questions will be answered by the project Superintendent or the Safety Manager
- e. Presentation of and attendance at weekly safety meetings is a condition of employment for any company or employee working with, or for, Darrell W. Anderson Construction.
- f. Entrance to a DWA Construction project or site will be considered an acknowledgement and agreement of compliance with this policy and all safety rules applicable to that site.
- f. Access to any project or property is by permission. Violators of safety rules or policies may be denied permission to enter. Employees or contracted companies may be denied access at the will of the Superintendent or Safety Manager. Previously granted permission may be revoked without prior notice.

Anyone entering a DWA project assumes the acceptance of this policy and the enforcement of rules within. They also agree to abide by the regulations set forth in the OSHA 1910 and 1926 regulations.

REPORTING OF INJURY or PROPERTY DAMAGE ACCIDENTS

All employees and/or Superintendents are responsible for filling out a **Notice of Injury or Property Damage** report immediately after an injury occurs, even if medical treatment is not required. Notice must be made at or near the time of the injury or property damage and on the same day of the accident. Employees must report the injury to their supervisor. Contracted employees must let their supervisor know, and the supervisor must pass this information to the project Superintendent. Reporting requirements are the same for property damage as an injury accident. Use the same form for near miss accident reporting.

Remember, the investigation process is part of the safety plan of DWA. The intent of the investigation is not to seek a person in which to place blame, it is to discover the root of the cause(s) of the accident and correct this situation. If noncompliance to an OSHA or policy rule is recognized as a contributing factor, disciplinary action *may* be taken with the individual and possibly their supervisor and/or company. Failure to report an injury immediately (meaning at or near the time of the injury and on the same day of the injury) is a violation of this Safety Policy, OSHA regulations and Workman's Compensation Fund. Failure to report injuries may result in the denial of services offered by the Workman's Compensation Fund.

REPORTING NEAR MISS ACCIDENTS

Near miss accidents may occur for various reasons or circumstances. A hazard that had not been previously recognized may become more evident or may not be recognized before a near miss accident occurs. A work practice that may have started safely may become hazardous because of changing conditions and an accident may result. Dodging the bullet once without correcting the situation may lead to an avoidable tragedy. Future accidents resulting from similar circumstances may be avoided by the early recognition and correction gained from past experience.

Reporting of near miss accidents is important to the effectiveness of Darrell Anderson Construction safety policies and plans. By reporting a near miss accident to the Superintendent, a hazardous condition or practice may be corrected in order to prevent the reoccurrence of an incidence, reducing the potential of an injury or illness. Near miss reporting should be considered and treated as a tool in the effective utilization of the safety plan.

- a. Employees reporting a near miss incident, where possible, will remain anonymous and will not face disciplinary action.
- b. Reporting of unsafe work practices of other workers will help in the prevention of injury to that employee and others in the vicinity.
- c. Additional training will be provided at the discretion of the supervisor or at the request of the employee.
- d. When it appears to be useful for further or future review, the Notice of A Near Miss Accident may be used and provided to the Safety Manager.

BASIC SAFETY RULES

Compliance with this Safety Policy and all OSHA 1910 and 1926 is a condition of employment. Employees who refuse compliance will be removed from the property and reentry to the site may be in jeopardy. Further employment or contract employment may be suspended.

These rules are meant to assist in the clarification of the most commonly violated OSHA rules. While compliance to these rules is a condition of employment with Darrell Anderson Construction it should be understood that all OSHA or owner imposed rules will also be enforced. It is the responsibility of the employer to provide training to their employees so they will work safely and in compliance with all applicable rules and regulations.

1. Hardhats will be worn at all times while on the construction site. Also, because of hazards from other contractors who are working different schedules, employees walking to, or from, their designated work sites are required to wear a hardhat. Hardhats will be worn as per manufacturers' specifications. The shell or suspension cannot be modified. The shell must not have paint or excessive stickers which could conceal damage to the shell.

Hardhats are required for all job tasks, in all locations of the project.

Noted exceptions to the hardhat rule:

- a. Hardhats are not required while inside vehicles or equipment supplied with a Roll Over Protective Structure (ROPS). It is expected that operators and supervisors will have a hardhat with them in the vehicle so that when they exit the vehicle or cab for any reason, the hardhat can be worn.
 - b. Hardhat use is not required at break time, provided the employees are safely out of danger of others who are working, or from danger from falling or airborne objects, i.e. personal or company vehicles, office trailers, tool trailers and the area near tool trailers that is designated for use as break areas. However, ***employees walking between their work areas and break areas or vehicles will be disciplined for not wearing a hardhat while walking through the construction area.***
2. Safety glasses will be worn as the minimum-required eye protection when there is a hazard presented by flying or airborne objects, dust contaminates or chemical exposure. Additional eye and face protection such as face shields are required for such operations as grinding, jack hammering, utilizing compressed air or handling chemicals, acids and caustics.
 3. Footwear must be suitable to the conditions of the work place and tasks performed. Boots must possess sturdy uppers and soles. If the employee is exposed to falling or rolling objects, steel toes must be worn.
 4. Fall Protection Requirements
 - a. When a body harness is required, all buckles and connections will be snugly fastened.
 - b. Full body harnesses and lanyards shall be worn and properly secured any time there is a fall hazard of more than six (6) feet.
 - c. A full body harness will be worn and the lanyard will be properly hooked to the proper connection point in the basket anytime an employee is ***using or moving*** an articulating manlift, no matter the reason or height of the basket.
 - d. Employees are not required to wear fall protection while using a scissor lift with the handrails raised and both feet on the platform. Any deviation from this rule or alteration of the equipment must be approved by the Safety Manager.
 - e. Contracted companies are required to supply body harnesses for their employees and provide training on the proper use of harnesses.
 - f. Lifelines or retractables will be used when installing guard rails or other fall protection devices.

- g. In the event fall protection cannot be achieved by means of a harnesses, a fall protection monitor will be provided by the contractor. The monitor is not allowed to conduct any work, run errands or do anything except watch and warn workers of the proximity of the edge or fall danger. Workers are allowed to approach the edge facing forward only.
5. Clothing must provide adequate protection to the body. Shirts with at least a tee sleeve and long pants will be worn at all times. No shorts are to be worn on DWA Construction projects.
 6. All personnel will be required to attend safety meetings as specified by project requirements. Subcontractors will conduct training and safety meetings applicable to the dangers of their work areas and tasks. Records of safety meetings will be made available to the Safety Manager upon request
 7. Supervisors and employees are responsible for keeping their work areas clean and hazard-free. Clean up is required when a job is finished or at the end of each work day. The responsible employees and their supervisor may face disciplinary action.
 8. All tools, whether company owned or personally owned by the employee, must be in good working condition. Defective tools or tools with faulty cords will not be used. Examples of defective tools include chisels with mushroomed heads, hammers with loose or split handles, guards missing on saws or grinders, electrical tools with defective cords, etc. Defective equipment will be reported to the Foreman or Superintendent who will remove it from service to be repaired or destroyed.
 9. All extension cords, drop cords, and electrical tools shall be checked daily. Defective cords will be immediately removed from service until repaired. Cord coverings shall be intact and free of defects that would lessen the original insulating value. Defective ends will be replaced with an approved repair end and by a qualified person.
 10. Practical jokes or “Horseplay” on the jobsite is strictly prohibited.
 11. The operator of equipment will never allow a passenger to ride on or in equipment not provided with a seat and seat belts for the use of the passenger. No one is allowed to ride in the bucket, on the forks or on any attachment that was not specifically designed and manufactured the purpose of personnel transportation. Both the passenger and the operator may be subject to disciplinary action.
 12. OSHA 1910.134 Safety Standards will be followed for job tasks requiring respiratory protection where there is a dust, mist or chemical hazard present. Respirators, training and an approved fit test will be provided by the employer.
 13. OSHA 1926 Subpart P Safety Standards will be followed during excavation work.
 - a. A ladder, ramp, or other safe means of egress is needed every 50 feet.
 - b. Any trench more than 5 feet deep shall be sloped, benched or protected by a trench box or shored to prevent a cave-in.

- c. Trenches and other open excavations are to be immediately barricaded or warning tape barriers put up. Traffic barriers must be placed to provide ample warning to motorists and equipment operators.
- d. Foot bridges must be installed and provided with fall protection where necessary.
- e. Excavated material must be at least 24" from the trench edge. Any loose debris, rocks and garbage must be removed from trench edges.
- f. Ground water must be controlled and trench sides must be monitored for erosion.

14. OSHA 1926.1053 ladder regulations will be enforced. Basic ladder rules will be followed by all employees:

- a. All ladders shall be inspected daily for broken or damaged side rails, bracing, top platform and feet.
- b. Damaged ladders shall be removed from service and from the jobsite.
- c. Ladders shall be used as intended by the manufacturer.
- d. Extension ladders will be secured at the top platform and extended three (3) feet past the working surface.
- e. A step ladder shall never be used as an extension ladder or lean against a wall. A step ladder must only be used when fully opened with braces locked.
- f. An employee will never step above the second rung of a step ladder, or use the top plate of a step ladder for a step or seat.
- g. The horizontal braces on the back of the ladder may never be used as a step.
- h. While on an extension ladder, an employee shall never allow his belt buckle to pass outside the plane of the side rails of the ladder.
- i. While working on or climbing a ladder, employees shall always face the ladder.
- j. Employees shall ascend and descend ladders using three contact points at all times.
- k. Extension ladders shall be placed on flat, solid ground. Slippery conditions shall be corrected prior to standing the ladder. The proper lean is a 4 to 1 ratio. Use the feet in an appropriate manner for the conditions. The ladder is to extend 3 feet past the roof edge and be secured at the top.

15. OSHA 1926.25 Housekeeping Safety Standards will be followed:

- a. It is the responsibility of each trade and employee to clean up after themselves.
- b. Debris will be kept clear of doorways, stairways, passageways, and work areas.
- c. Nails will be immediately pulled or bent over, eliminating puncture danger.
- d. Garbage and construction debris will not be allowed to accumulate and must be properly disposed of at frequent intervals.

16. OSHA 1926 Subpart L Safety Standards for scaffolding will be enforced

- a. Scaffold sections shall be set level and plumb.
- b. Planks will be aluminum or manufactured wood planks to conform with OSHA regulations.
- c. Dimensional building lumber **will not be used**.
- d. Scaffold set on uneven ground will set on mud sills and adjustable feet.
- e. Fall protection is required when working more than 6 feet above the ground. Personal fall protection is not required if a guardrail system is in place.

- f. Barricades will be provided for the protection of ground personnel.
 - g. Planks will extend to the full width of the scaffold.
 - h. Snow, ice, mud, grease will be promptly removed. Scaffold walkways will be free of tools, hoses, equipment and materials.
 - i. Scaffolds will be placed on solid, even ground. Never set scaffolding on blocks, rocks, boxes or any other loose material which may roll or slide.
17. Radios and electronic devices are allowed on DWA Construction projects so long as it does not distract the employee or disrupt normal conversation. The volume on radios must be low enough to permit conversation and enable the worker to hear verbal warnings of danger.
18. Firearms are not allowed on any project. Firearms may be stored out of sight in personal vehicles that remain locked.

DISCIPLINARY ACTION POLICY

Any employee or visitor on a DWA Construction project is subject to this Disciplinary Action Policy, regardless of position or title.

Safety violation notice(s) shall be issued to any employee, contractor employee, or anyone on the jobsite violating the safety rules or regulations. The individual's immediate supervisor may be subject the same violation and disciplinary action as the employee.

1. Any violation of safety rules can result in suspension or immediate termination.
2. Any employee of DWA Construction receiving three written safety violations within a six month period shall be terminated. Contract employees, who demonstrate a disregard for the DWA Construction safety policy will be placed on probation, or terminated.
3. An employee or entire company may be removed from the property at the discretion of the Safety Manager or the project superintendent.
 - a. A meeting may be arranged at the discretion and convenience of the Safety Manager or designee to discuss the violator's plan for compliance. Reentry will be permitted only after the Safety Manager or a designee has reviewed and approved the plan for corrective action. ***At the discretion*** of the Safety Manager or designee, the violator will be granted permission to resume work. Should the violation reoccur, the violator will be removed and permission to return under any condition may be jeopardized.
 - b. Companies or employees in violation because of insufficient or unacceptable safety equipment will not be allowed to resume the task until acceptable equipment is obtained.
 - c. The employment status of employees removed from the property will be determined by ***their*** employer.
 - d. Offenders of this policy, or violation of any OSHA regulation while on a project property, may lose the privilege of employment with DWA Construction.
 - e. Habitual offenders may be escorted off the property without prior warning.
 - f. Supervisors for DWA Construction and supervisors for contracted companies may face disciplinary action as the result of a safety or health violation by their subordinates.

Rules which will result in immediate termination.

1. Fighting, show of physical aggression or verbal abuse.
2. Drug or alcohol use or possession of drugs or alcohol.
3. Refusal to submit to a drug test.

******It should be understood that DWA Construction Inc. is not restricting itself to the above rules. Additional rules as dictated by the project or job task may be demanded by the DWA Construction Safety Manager to assure the safety of all employees on the jobsite.***

DWA Construction, Inc

Safety Policy Acknowledgement

Policy effective September 14, 2016

I, _____ (please print full name) hereby acknowledge that I have received, read and understand the DWA Construction safety policy. I have been given the opportunity to ask questions regarding this safety policy. I have also read and understand the disciplinary actions that may be imposed upon me for violating any of the rules or regulations.

I agree to comply with all safety requirements of DWA Construction, OSHA requirements or safety or health requirements imposed by the owner of the property on which I am working. I also agree to comply with requirements of safety procedures not addressed in this policy, or requirements of my immediate supervisor or any member of DWA management.

I understand that I am encouraged to discuss with the safety manager, my supervisor or any member of management, safety procedures or requirements that are unclear or I do not understand. I further acknowledge that this company respects my opinions and suggestions I may have to help ensure the safety of myself, other employees of this company or any workers contracted to perform work for DWA Construction and the property of any company or individual on the jobsite.

I understand it is my personal responsibility to stay informed of any changes in safety procedures or requirements imposed by varying jobsite conditions or work tasks. I will discuss with my supervisor any concerns or conditions which may endanger myself, other workers or property.

I acknowledge any disciplinary action taken against me will become a part of my permanent record and that repetitive violations may result in my dismissal.

Employee signature: _____

Date: _____

Presented by: _____

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**SECTION 01 4000
QUALITY REQUIREMENTS**

PART 1 GENERAL

1.01 SECTION INCLUDES

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

1.02 RELATED REQUIREMENTS

- A. Section 01 2100 - Allowances: Allowance for payment of testing services.
- B. Section 01 3000 - Administrative Requirements: Submittal procedures.
- C. Section 01 4216 - Definitions.

1.03 REFERENCE STANDARDS

- A. ASTM C1077 - Standard Practice for Agencies Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Testing Agency Evaluation; 2024.
- B. ASTM C1093 - Standard Practice for Accreditation of Testing Agencies for Masonry; 2023.
- C. 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.
- D. ASTM E329 - Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection; 2023.
- E. ASTM E543 - Standard Specification for Agencies Performing Nondestructive Testing; 2021.
- F. IAS AC89 - Accreditation Criteria for Testing Laboratories; 2021.

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 CMGC Contractor .
 - 1. Include:
 - a. Date issued.
 - b. Project title and number.
 - c. Name of inspector.
 - d. Date and time of sampling or inspection.
 - e. Identification of product and specifications section.
 - f. Location in the Project.
 - g. Type of test/inspection.
 - h. Date of test/inspection.
 - i. Results of test/inspection.
 - j. Compliance with Contract Documents.
 - k. When requested by Architect, provide interpretation of results.

2. Test report submittals are for Architect's knowledge as contract administrator for the limited purpose of assessing compliance with information given and the design concept expressed in the Contract Documents, or for Owner's information.
- D. Certificates: When specified in individual specification sections, submit certification by the manufacturer and CMGC Contractor or installation/application subcontractor to Architect, in quantities specified for Product Data.
 1. Indicate material or product complies with or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.
 2. Certificates may be recent or previous test results on material or product, but must be acceptable to Architect.
- E. Manufacturer's Instructions: When specified in individual specification sections, submit printed instructions for delivery, storage, assembly, installation, start-up, adjusting, and finishing, for the Owner's information. Indicate special procedures, perimeter conditions requiring special attention, and special environmental criteria required for application or installation.
- F. Manufacturer's Field Reports: Submit reports for Architect's benefit as contract administrator or for Owner.
 1. Submit report in duplicate within 30 days of observation to Architect for information.
 2. Submit for information for the limited purpose of assessing compliance with information given and the design concept expressed in the Contract Documents.

1.05 QUALITY ASSURANCE

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

1.06 REFERENCES AND STANDARDS

- A. For products and workmanship specified by reference to a document or documents not included in the Project Manual, also referred to as reference standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.
- B. Comply with reference standard of date of issue current on date of Contract Documents, except where a specific date is established by applicable code.
- C. Obtain copies of standards where required by product specification sections.
- D. Maintain copy at project site during submittals, planning, and progress of the specific work, until Substantial Completion.
- E. Should specified reference standards conflict with Contract Documents, request clarification from Architect before proceeding.
- F. Neither the contractual relationships, duties, or responsibilities of the parties in Contract nor those of Architect shall be altered from Contract Documents by mention or inference otherwise in any reference document.

1.07 TESTING AND INSPECTION AGENCIES AND SERVICES

- A. Owner will employ services of an independent testing agency to perform certain specified testing and inspection; payment for cost of services will be derived from allowance specified in Section 01 2100; see Section 01 2100 and applicable sections for description of services included in allowance.
- B. Owner will employ and pay for services of an independent testing agency to perform other specified testing.
- C. CMGC Contractor shall employ and pay for services of an independent testing agency to perform other specified testing.

- D. As indicated in individual specification sections, Owner or CMGC Contractor shall employ and pay for services of an independent testing agency to perform other specified testing.
- E. Employment of agency in no way relieves CMGC Contractor of obligation to perform Work in accordance with requirements of Contract Documents.
- F. CMGC Contractor Employed Agency:
 - 1. Laboratory: Authorized to operate in Utah.
 - 2. Laboratory Staff: Maintain a full time registered Engineer on staff to review services.
 - 3. Testing Equipment: Calibrated at reasonable intervals either by NIST or using an NIST established Measurement Assurance Program, under a laboratory measurement quality assurance program.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 CONTROL OF INSTALLATION

- A. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce work of specified quality.
- B. Comply with manufacturers' instructions, including each step in sequence.
- C. Should manufacturers' instructions conflict with Contract Documents, request clarification from Architect before proceeding.
- D. Comply with specified standards as minimum quality for the work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
- E. Have work performed by persons qualified to produce required and specified quality.
- F. Verify that field measurements are as indicated on shop drawings or as instructed by the manufacturer.
- G. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, and disfigurement.

3.02 MOCK-UPS

- A. Accepted mock-ups establish the standard of quality the Architect will use to judge the Work.
- B. Notify Architect and None - N/A Consultant fifteen (15) working days in advance of dates and times when mock-ups will be constructed.
- C. Tests shall be performed under provisions identified in this section and identified in the respective product specification sections.
- D. Assemble and erect specified items with specified attachment and anchorage devices, flashings, seals, and finishes.
- E. Architect will use accepted mock-ups as a comparison standard for the remaining Work.
- F. Where mock-up has been accepted by Architect and is specified in product specification sections to be removed, protect mock-up throughout construction, remove mock-up and clear area when directed to do so by Architect.

3.03 TOLERANCES

- A. Monitor fabrication and installation tolerance control of products to produce acceptable Work. Do not permit tolerances to accumulate.
- B. Comply with manufacturers' tolerances. Should manufacturers' tolerances conflict with Contract Documents, request clarification from Architect before proceeding.
- C. Adjust products to appropriate dimensions; position before securing products in place.

3.04 TESTING AND INSPECTION

- A. Testing Agency Duties:

1. Provide qualified personnel at site. Cooperate with Architect and CMGC Contractor in performance of services.
 2. Perform specified sampling and testing of products in accordance with specified standards.
 3. Ascertain compliance of materials and mixes with requirements of Contract Documents.
 4. Perform additional tests and inspections required by Architect.
 5. Submit reports of all tests/inspections specified.
- B. Limits on Testing/Inspection Agency Authority:
1. Agency may not release, revoke, alter, or enlarge on requirements of Contract Documents.
 2. Agency may not approve or accept any portion of the Work.
 3. Agency may not assume any duties of CMGC Contractor .
 4. Agency has no authority to stop the Work.
- C. CMGC Contractor Responsibilities:
1. Deliver to agency at designated location, adequate samples of materials proposed to be used that require testing, along with proposed mix designs.
 2. Cooperate with laboratory personnel, and provide access to the Work and to manufacturers' facilities.
 3. Provide incidental labor and facilities:
 - a. To provide access to Work to be tested/inspected.
 - b. To obtain and handle samples at the site or at source of Products to be tested/inspected.
 - c. To facilitate tests/inspections.
 - d. To provide storage and curing of test samples.
 4. Notify Architect and laboratory 24 hours prior to expected time for operations requiring testing/inspection services.
 5. Employ services of an independent qualified testing laboratory and pay for additional samples, tests, and inspections required by CMGC Contractor beyond specified requirements.
 6. Arrange with Owner's agency and pay for additional samples, tests, and inspections required by CMGC Contractor beyond specified requirements.
- D. Re-testing required because of non-compliance with specified requirements shall be performed by the same agency on instructions by Architect.
- E. Re-testing required because of non-compliance with specified requirements shall be paid for by CMGC Contractor .

3.05 MANUFACTURERS' FIELD SERVICES

- A. When specified in individual specification sections, require material or product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship, start-up of equipment, test, adjust, and balance equipment as applicable, and to initiate instructions when necessary.
- B. Report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.

3.06 DEFECT ASSESSMENT

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

END OF SECTION 01 4000

**SECTION 01 4216
DEFINITIONS**

PART 1 GENERAL

1.01 SUMMARY

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

1.02 DEFINITIONS

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

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION 01 4216

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**SECTION 01 4219
REFERENCE STANDARDS**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Requirements relating to referenced standards.
- B. Reference standards full title and edition date.

1.02 QUALITY ASSURANCE

- A. For products or workmanship specified by reference to a document or documents not included in the Project Manual, also referred to as reference standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.
- B. Should specified reference standards conflict with Contract Documents, request clarification from the Architect before proceeding.
- C. Neither the contractual relationships, duties, or responsibilities of the parties in Contract nor those of the Architect shall be altered by Contract Documents by mention or inference otherwise in any reference document.

PART 2 CONSTRUCTION INDUSTRY ORGANIZATION DOCUMENTS

2.01 AASHTO -- AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS

2.02 ACI -- AMERICAN CONCRETE INSTITUTE INTERNATIONAL

- A. ACI SP-66 - ACI Detailing Manual; 2004.

2.03 ASTM A SERIES -- ASTM INTERNATIONAL

- A. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2023.
- B. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2023.

2.04 ASTM D SERIES -- ASTM INTERNATIONAL

- A. ASTM D1227 - Standard Specification for Emulsified Asphalt Used as a Protective Coating for Roofing; 2013.

2.05 GA -- GYPSUM ASSOCIATION

- A. GA-201 - Using Gypsum Board for Walls & Ceilings; 1990.
- B. GA-214 - Levels of Finish for Gypsum Panel Products; 2021.

2.06 GANA -- GLASS ASSOCIATION OF NORTH AMERICA

- A. GANA (GM) - GANA Glazing Manual; 2022.
- B. GANA (SM) - GANA Sealant Manual; 2008.

2.07 ICC -- INTERNATIONAL CODE COUNCIL, INC.

- A. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2017.
- B. ICC (IBC) - International Building Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- C. ICC (IECC) - International Energy Conservation Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- D. ICC (IFC) - International Fire Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- E. ICC (IMC) - International Mechanical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

- F. ICC (IPC) - International Plumbing Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

2.08 ICC-ES -- ICC EVALUATION SERVICE, INC.

2.09 NFRC -- NATIONAL FENESTRATION RATING COUNCIL, INC.

- A. NFRC 100 - Procedure for Determining Fenestration Product U-factors; 2023.
- B. NFRC 200 - Procedure for Determining Fenestration Product Solar Heat Gain Coefficient and Visible Transmittance at Normal Incidence; 2023.
- C. NFRC (CPD) - Certified Product Directory - National Fenestration Rating Council; Current Edition.

2.10 TMS -- THE MASONRY SOCIETY

- A. TMS 402/602 - Building Code Requirements and Specification for Masonry Structures; 2022, with Errata (2024).

2.11 TPI -- TURFGRASS PRODUCERS INTERNATIONAL

- A. TPI (SPEC) - Guideline Specifications to Turfgrass Sodding; 2006.

PART 3 UNITED STATES GOVERNMENT AND RELATED AGENCIES DOCUMENTS

3.01 COE -- CORPS OF ENGINEERS, U.S. ARMY

END OF SECTION 01 4219

**SECTION 01 5000
TEMPORARY FACILITIES AND CONTROLS**

PART 1 GENERAL

1.01 SECTION INCLUDES

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

1.02 TEMPORARY UTILITIES

- A. Owner will provide the following:
 - 1. Electrical power, consisting of connection to existing facilities.
 - 2. Water supply, consisting of connection to existing facilities.
- B. Provide and pay for all electrical power, lighting, and water required for construction purposes.
- C. Existing facilities with power at the scoreboard be used.
- D. Use trigger-operated nozzles for water hoses, to avoid waste of water.

1.03 TELECOMMUNICATIONS SERVICES

- A. Provide, maintain, and pay for telecommunications services to field office at time of project mobilization.

1.04 TEMPORARY SANITARY FACILITIES

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

1.05 BARRIERS

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

1.06 FENCING

- A. Construction: CMGC Contractor 's option.
- B. Provide 6 foot high fence around construction site; equip with vehicular and pedestrian gates with locks.

1.07 EXTERIOR ENCLOSURES

- A. Provide temporary insulated weather tight closure of exterior openings to accommodate acceptable working conditions and protection for Products, to allow for temporary heating and maintenance of required ambient temperatures identified in individual specification sections, and to prevent entry of unauthorized persons. Provide access doors with self-closing hardware and locks.

1.08 INTERIOR ENCLOSURES

- A. Provide temporary partitions and ceilings as indicated to separate work areas from Owner-occupied areas, to prevent penetration of dust and moisture into Owner-occupied areas, and to prevent damage to existing materials and equipment.
- B. Construction: Framing and reinforced polyethylene sheet materials with closed joints and sealed edges at intersections with existing surfaces:

1.09 SECURITY

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

1.10 VEHICULAR ACCESS AND PARKING

- A. Coordinate access and haul routes with governing authorities and Owner.
- B. Provide and maintain access to fire hydrants, free of obstructions.
- C. Provide means of removing mud from vehicle wheels before entering streets.
- D. Provide temporary parking areas to accommodate construction personnel. When site space is not adequate, provide additional off-site parking.

1.11 WASTE REMOVAL

- A. Provide waste removal facilities and services as required to maintain the site in clean and orderly condition.
- B. Provide containers with lids. Remove trash from site periodically.
- C. If materials to be recycled or re-used on the project must be stored on-site, provide suitable non-combustible containers; locate containers holding flammable material outside the structure unless otherwise approved by the authorities having jurisdiction.
- 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. Erect on site at location indicated.
- C. No other signs are allowed without Owner permission except those required by law.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION 01 5000

**SECTION 01 6000
PRODUCT REQUIREMENTS**

PART 1 GENERAL

1.01 SECTION INCLUDES

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

1.02 RELATED REQUIREMENTS

- A. Section 01 1000 - Summary: Lists of products to be removed from existing building.
- B. Section 01 2500 - Substitution Procedures: Substitutions made during procurement and/or construction phases.
- C. Section 01 4000 - Quality Requirements: Product quality monitoring.
- D. Section 01 6116 - Volatile Organic Compound (VOC) Content Restrictions: Requirements for VOC-restricted product categories.
- E. Section 01 7419 - Construction Waste Management and Disposal: Waste disposal requirements potentially affecting product selection, packaging and substitutions.

1.03 SUBMITTALS

- A. Proposed Products List: Submit list of major products proposed for use, with name of manufacturer, trade name, and model number of each product.
 - 1. Submit within 15 days after date of Notice to Proceed.
 - 2. For products specified only by reference standards, list applicable reference standards.
- B. Product Data Submittals: Submit manufacturer's standard published data. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information specific to this Project.
- C. Shop Drawing Submittals: Prepared specifically for this Project; indicate utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.
- D. Sample Submittals: Illustrate functional and aesthetic characteristics of the product, with integral parts and attachment devices. Coordinate sample submittals for interfacing work.
 - 1. For selection from standard finishes, submit samples of the full range of the manufacturer's standard colors, textures, and patterns.

PART 2 PRODUCTS

2.01 EXISTING PRODUCTS

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

2.02 NEW PRODUCTS

- A. Provide new products unless specifically required or permitted by Contract Documents.

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

2.03 PRODUCT OPTIONS

- A. Products Specified by Reference Standards or by Description Only: Use any product meeting those standards or description.
- B. Products Specified by Naming One or More Manufacturers: Use a product of one of the manufacturers named and meeting specifications, substitutions allowed as per each individual section upon approval during bidding process. Contactors may bid on approved manufacturer's products or substitutions approved during bidding; those that are approved in an addendum.
- C. Products Specified by Naming One or More Manufacturers with a Provision for Substitutions: Submit a request for substitution for any manufacturer not named.

2.04 MAINTENANCE MATERIALS

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

PART 3 EXECUTION

3.01 SUBSTITUTION LIMITATIONS

- A. See Section 01 2500 - Substitution Procedures.

3.02 OWNER-SUPPLIED PRODUCTS

- A. Owner's Responsibilities:
 - 1. Arrange for and deliver Owner reviewed shop drawings, product data, and samples, to CMGC Contractor .
 - 2. Arrange and pay for product delivery to site.
 - 3. On delivery, inspect products jointly with CMGC Contractor .
 - 4. Submit claims for transportation damage and replace damaged, defective, or deficient items.
 - 5. Arrange for manufacturers' warranties, inspections, and service.
- B. CMGC Contractor 's Responsibilities:
 - 1. Review Owner reviewed shop drawings, product data, and samples.
 - 2. Receive and unload products at site; inspect for completeness or damage jointly with Owner.
 - 3. Handle, store, install and finish products.
 - 4. Repair or replace items damaged after receipt.

3.03 TRANSPORTATION AND HANDLING

- A. Package products for shipment in manner to prevent damage; for equipment, package to avoid loss of factory calibration.
- B. If special precautions are required, attach instructions prominently and legibly on outside of packaging.
- C. Coordinate schedule of product delivery to designated prepared areas in order to minimize site storage time and potential damage to stored materials.
- D. Transport and handle products in accordance with manufacturer's instructions.

- E. Transport materials in covered trucks to prevent contamination of product and littering of surrounding areas.
- F. Promptly inspect shipments to ensure that products comply with requirements, quantities are correct, and products are undamaged.
- G. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage, and to minimize handling.
- H. Arrange for the return of packing materials, such as wood pallets, where economically feasible.

3.04 STORAGE AND PROTECTION

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

END OF SECTION 01 6000

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**SECTION 01 6116
VOLATILE ORGANIC COMPOUND (VOC) CONTENT RESTRICTIONS**

PART 1 GENERAL

1.01 SECTION INCLUDES

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

1.02 RELATED REQUIREMENTS

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

1.03 DEFINITIONS

- A. Indoor-Emissions-Restricted Products: All products in the following product categories, whether specified or not:
 - 1. Interior paints and coatings applied on site.
 - 2. Interior adhesives and sealants applied on site, including flooring adhesives.
 - 3. Flooring.
 - 4. Composite wood.
 - 5. Products making up wall and ceiling assemblies.
 - 6. Thermal and acoustical insulation.
- B. VOC-Content-Restricted Products: All products in the following product categories, whether specified or not:
 - 1. Interior paints and coatings applied on site.
 - 2. Interior adhesives and sealants applied on site, including flooring adhesives.
- C. Interior of Building: Anywhere inside the exterior weather barrier.
- D. Adhesives: All gunnable, trowelable, liquid-applied, and aerosol adhesives, whether specified or not; including flooring adhesives, resilient base adhesives, and pipe jointing adhesives.
- E. Sealants: All gunnable, trowelable, and liquid-applied joint sealants and sealant primers, whether specified or not; including firestopping sealants and duct joint sealers.
- F. Inherently Non-Emitting Materials: Products composed wholly of minerals or metals, unless they include organic-based surface coatings, binders, or sealants; and specifically the following:
 - 1. Concrete.
 - 2. Clay brick.
 - 3. Metals that are plated, anodized, or powder-coated.
 - 4. Glass.
 - 5. Ceramics.
 - 6. Solid wood flooring that is unfinished and untreated.

1.04 REFERENCE STANDARDS

1.05 UTAH ADMINISTRATIVE CODE - R307 ENVIROMENTAL QUALITY, AIR QUALITY; RULE R307-357. CONSUMER PRODUCTS.

- A. 40 CFR 59, Subpart D - National Volatile Organic Compound Emission Standards for Architectural Coatings; U.S. Environmental Protection Agency; Current Edition.
- B. ASTM D3960 - Standard Practice for Determining Volatile Organic Compound (VOC) Content of Paints and Related Coatings; 2005 (Reapproved 2018).
- C. CARB (SCM) - Suggested Control Measure for Architectural Coatings; California Air Resources Board; 2020.
- D. SCAQMD 1113 - Architectural Coatings; 1977, with Amendment (2016).
- E. SCAQMD 1168 - Adhesive and Sealant Applications; 1989, with Amendment (2022).

1.06 SUBMITTALS

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

1.07 QUALITY ASSURANCE

- A. VOC Content Test Method: 40 CFR 59, Subpart D (EPA Method 24), or ASTM D3960, unless otherwise indicated.
 - 1. Evidence of Compliance: Acceptable types of evidence are:
 - a. Report of laboratory testing performed in accordance with requirements.
- B. 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 Products: Comply with the most stringent of federal, State, and local requirements, or these specifications.
- B. VOC-Content-Restricted Products: VOC content not greater than required by the following:
 - 1. Adhesives, Including Flooring Adhesives: SCAQMD 1168 Rule.
 - 2. Joint Sealants: SCAQMD 1168 Rule.
 - 3. Paints and Coatings: Each color; most stringent of the following:
 - a. 40 CFR 59, Subpart D.
 - b. SCAQMD 1113 Rule.
 - c. CARB (SCM).

PART 3 EXECUTION

3.01 FIELD QUALITY CONTROL

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

END OF SECTION 01 6116

**SECTION 01 7000
EXECUTION AND CLOSEOUT REQUIREMENTS**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Examination, preparation, and general installation procedures.
- B. Requirements for alterations work, including selective demolition, None - N/A.
- C. Pre-installation meetings.
- D. Cutting and patching.
- E. Surveying for laying out the work.
- F. Cleaning and protection.
- G. Starting of systems and equipment.
- H. Demonstration and instruction of Owner personnel.
- I. Closeout procedures, including CMGC Contractor 's Correction Punch List, except payment procedures.
- J. General requirements for maintenance service.

1.02 RELATED REQUIREMENTS

- A. Section 01 1000 - Summary: Limitations on working in existing building; continued occupancy; work sequence; identification of salvaged and relocated materials.
- B. Section 01 5000 - Temporary Facilities and Controls: Temporary exterior enclosures.
- C. Section 01 5000 - Temporary Facilities and Controls: Temporary interior partitions.
- D. Section 01 7800 - Closeout Submittals: Project record documents, operation and maintenance data, warranties, and bonds.
- E. Section 02 4100 - Demolition: Demolition of whole structures and parts thereof; site utility demolition.
- F. Section 07 8400 - Firestopping.
- G. Individual Product Specification Sections:
 - 1. Advance notification to other sections of openings required in work of those sections.

1.03 REFERENCE STANDARDS

- A. NFPA 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations; 2022, with Errata (2021).

1.04 SUBMITTALS

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

1.05 QUALIFICATIONS

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

1.06 PROJECT CONDITIONS

- A. Use of explosives is not permitted.
- B. Grade site to drain. Maintain excavations free of water. Provide, operate, and maintain pumping equipment.
- C. Protect site from puddling or running water. Provide water barriers as required to protect site from soil erosion.
- D. Ventilate enclosed areas to assist cure of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases.
- E. Dust Control: Execute work by methods to minimize raising dust from construction operations. Provide positive means to prevent air-borne dust from dispersing into atmosphere and over adjacent property.
 - 1. Provide dust-proof enclosures to prevent entry of dust generated outdoors.
 - 2. Provide dust-proof barriers between construction areas and areas continuing to be occupied by Owner.
- F. Erosion and Sediment Control: Plan and execute work by methods to control surface drainage from cuts and fills, from borrow and waste disposal areas. Prevent erosion and sedimentation.
- G. Noise Control: Provide methods, means, and facilities to minimize noise produced by construction operations.
 - 1. Outdoors: Limit conduct of especially noisy exterior work to the hours of 8 am to 5 pm.
 - 2. Indoors: Limit conduct of especially noisy interior work to the hours of 6 pm to 7 am.
- H. Pollution Control: Provide methods, means, and facilities to prevent contamination of soil, water, and atmosphere from discharge of noxious, toxic substances, and pollutants produced by construction operations. Comply with federal, state, and local regulations.

1.07 COORDINATION

- A. See Section 01 1000 for occupancy-related requirements.
- B. Coordinate scheduling, submittals, and work of the various sections of the Project Manual to ensure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.
- C. Notify affected utility companies and comply with their requirements.
- D. Verify that utility requirements and characteristics of new operating equipment are compatible with building utilities. Coordinate work of various sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.
- E. Coordinate space requirements, supports, and installation of mechanical and electrical work that are indicated diagrammatically on drawings. Follow routing indicated for pipes, ducts, and conduit, as closely as practicable; place runs parallel with lines of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.
- F. In finished areas except as otherwise indicated, conceal pipes, ducts, and wiring within the construction. Coordinate locations of fixtures and outlets with finish elements.
- G. Coordinate completion and clean-up of work of separate sections.
- H. After Owner occupancy of premises, coordinate access to site for correction of defective work and work not in accordance with Contract Documents, to minimize disruption of Owner's activities.

PART 2 PRODUCTS

2.01 PATCHING MATERIALS

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

PART 3 EXECUTION

3.01 EXAMINATION

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

3.02 PREPARATION

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

3.03 PREINSTALLATION MEETINGS

- A. When required in individual specification sections, convene a preinstallation meeting at the site prior to commencing work of the section.
- B. Require attendance of parties directly affecting, or affected by, work of the specific section.
- C. Notify Architect four days in advance of meeting date.
- D. Prepare agenda and preside at meeting:
 - 1. Review conditions of examination, preparation and installation procedures.
 - 2. Review coordination with related work.
- E. Record minutes and distribute copies within two days after meeting to participants, with two copies to Architect, Owner, participants, and those affected by decisions made.

3.04 LAYING OUT THE WORK

- A. Verify locations of survey control points prior to starting work.
- B. Promptly notify Architect of any discrepancies discovered.
- C. CMGC Contractor shall locate and protect survey control and reference points.
- D. Protect survey control points prior to starting site work; preserve permanent reference points during construction.
- E. Promptly report to Architect the loss or destruction of any reference point or relocation required because of changes in grades or other reasons.

- F. Replace dislocated survey control points based on original survey control. Make no changes without prior written notice to Architect.
- G. Utilize recognized engineering survey practices.
- H. Establish elevations, lines and levels. Locate and lay out by instrumentation and similar appropriate means:
 - 1. Grid or axis for structures.
 - 2. Building foundation, column locations, ground floor elevations.
- I. Periodically verify layouts by same means.
- J. Maintain a complete and accurate log of control and survey work as it progresses.

3.05 GENERAL INSTALLATION REQUIREMENTS

- A. Install products as specified in individual sections, in accordance with manufacturer's instructions and recommendations, and so as to avoid waste due to necessity for replacement.
- B. Make vertical elements plumb and horizontal elements level, unless otherwise indicated.
- C. Install equipment and fittings plumb and level, neatly aligned with adjacent vertical and horizontal lines, unless otherwise indicated.
- D. Make consistent texture on surfaces, with seamless transitions, unless otherwise indicated.
- E. Make neat transitions between different surfaces, maintaining texture and appearance.

3.06 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.
- 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. 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.

3.07 CUTTING AND PATCHING

- A. Whenever possible, execute the work by methods that avoid cutting or patching.
- B. See Alterations article above for additional requirements.
- C. Perform whatever cutting and patching is necessary to:
 1. Complete the work.
 2. Fit products together to integrate with other work.
 3. Provide openings for penetration of mechanical, electrical, and other services.
 4. Match work that has been cut to adjacent work.
 5. Repair areas adjacent to cuts to required condition.
 6. Repair new work damaged by subsequent work.
 7. Remove samples of installed work for testing when requested.
 8. Remove and replace defective and non-complying work.

- D. Execute work by methods that avoid damage to other work and that will provide appropriate surfaces to receive patching and finishing. In existing work, minimize damage and restore to original condition.
- E. Employ skilled and experienced installer to perform cutting for weather exposed and moisture resistant elements, and sight exposed surfaces.
- F. Cut rigid materials using masonry saw or core drill. Pneumatic tools not allowed without prior approval.
- G. Restore work with new products in accordance with requirements of Contract Documents.
- H. Fit work air tight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.
- I. 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.

3.08 PROGRESS CLEANING

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

3.09 PROTECTION OF INSTALLED WORK

- A. Protect installed work from damage by construction operations.
- B. Provide special protection where specified in individual specification sections.
- C. Provide temporary and removable protection for installed products. Control activity in immediate work area to prevent damage.
- D. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.
- E. Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.
- F. Protect work from spilled liquids. If work is exposed to spilled liquids, immediately remove protective coverings, dry out work, and replace protective coverings.
- G. Prohibit traffic or storage upon waterproofed or roofed surfaces. If traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer.
- H. Remove protective coverings when no longer needed; reuse or recycle coverings if possible.

3.10 SYSTEM STARTUP

- A. Coordinate schedule for start-up of various equipment and systems.
- B. Notify Architect and Owner seven days prior to start-up of each item.
- C. Verify that each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, control sequence, and for conditions that may cause damage.

- D. Verify tests, meter readings, and specified electrical characteristics agree with those required by the equipment or system manufacturer.
- E. Verify that wiring and support components for equipment are complete and tested.
- F. Execute start-up under supervision of applicable CMGC Contractor personnel and manufacturer's representative in accordance with manufacturers' instructions.
- G. Submit a written report that equipment or system has been properly installed and is functioning correctly.

3.11 DEMONSTRATION AND INSTRUCTION

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

3.12 ADJUSTING

- A. Adjust operating products and equipment to ensure smooth and unhindered operation.

3.13 FINAL CLEANING

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

3.14 CLOSEOUT PROCEDURES

- A. Make submittals that are required by governing or other authorities.
- B. Accompany Project Coordinator on preliminary observation to determine items to be listed for completion or correction in the CMGC Contractor 's Correction Punch List for CMGC Contractor 's Notice of Substantial Completion.
- C. Notify Architect when work is considered ready for Architect's Substantial Completion observation.
- D. Conduct Substantial Completion observation and create Final Correction Punch List containing Architect's and CMGC Contractor 's comprehensive list of items identified to be completed or corrected and submit to Architect.
- E. Correct items of work listed in Final Correction Punch List and comply with requirements for access to Owner-occupied areas.

- F. Notify Architect when work is considered finally complete and ready for Architect's Substantial Completion final observation.
- G. Complete items of work determined by Architect listed in executed Certificate of Substantial Completion.

3.15 MAINTENANCE

- A. Provide service and maintenance of components indicated in specification sections.
- B. Maintenance Period: As indicated in specification sections or, if not indicated, not less than one year from the Date of Substantial Completion or the length of the specified warranty, whichever is longer.
- C. Examine system components at a frequency consistent with reliable operation. Clean, adjust, and lubricate as required.
- D. Include systematic examination, adjustment, and lubrication of components. Repair or replace parts whenever required. Use parts produced by the manufacturer of the original component.
- E. Maintenance service shall not be assigned or transferred to any agent or subcontractor without prior written consent of the Owner.

END OF SECTION 01 7000

**SECTION 01 7800
CLOSEOUT SUBMITTALS**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Project record documents.
- B. Warranties and bonds.

1.02 RELATED REQUIREMENTS

- A. Section 00 4000 05.1 Sub Bonds: Performance bond and labor and material payment bonds, warranty, and correction of work.
- B. Section 01 3000 - Administrative Requirements: Submittals procedures, shop drawings, product data, and samples.
- C. Section 01 7000 - Execution and Closeout Requirements: Contract closeout procedures.
- D. Individual Product Sections: Warranties required for specific products or Work.

1.03 SUBMITTALS

- A. Project Record Documents: Submit documents to Architect with claim for final Application for Payment.
- B. Warranties and Bonds:
 - 1. For equipment or component parts of equipment put into service during construction with Owner's permission, submit documents within 10 days after acceptance.
 - 2. Make other submittals within 10 days after Date of Substantial Completion, prior to final Application for Payment.
 - 3. For items of Work for which acceptance is delayed beyond Date of Substantial Completion, submit within 10 days after acceptance, listing the date of acceptance as the beginning of the warranty period.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 PROJECT RECORD DOCUMENTS

- A. Maintain on site one set of the following record documents; record actual revisions to the Work:
 - 1. Drawings.
 - 2. Addenda.
 - 3. Change Orders and other modifications to the Contract.
 - 4. Reviewed shop drawings, product data, and samples.
 - 5. Manufacturer's instruction for assembly, installation, and adjusting.
- B. Ensure entries are complete and accurate, enabling future reference by Owner.
- C. Store record documents separate from documents used for construction.
- D. Record information concurrent with construction progress.
- E. Record Drawings and Shop Drawings: Legibly mark each item to record actual construction including:
 - 1. Field changes of dimension and detail.
 - 2. Details not on original Contract drawings.

3.02 OPERATION AND MAINTENANCE DATA FOR MATERIALS AND FINISHES

- A. For Each Product, Applied Material, and Finish:
- B. Instructions for Care and Maintenance: Manufacturer's recommendations for cleaning agents and methods, precautions against detrimental cleaning agents and methods, and recommended schedule for cleaning and maintenance.
- C. Where additional instructions are required, beyond the manufacturer's standard printed instructions, have instructions prepared by personnel experienced in the operation and

maintenance of the specific products.

3.03 OPERATION AND MAINTENANCE DATA FOR EQUIPMENT AND SYSTEMS

- A. For Each Item of Equipment and Each System:
 - 1. Description of unit or system, and component parts.
 - 2. Identify function, normal operating characteristics, and limiting conditions.
 - 3. Include performance curves, with engineering data and tests.
 - 4. Complete nomenclature and model number of replaceable parts.
- B. Where additional instructions are required, beyond the manufacturer's standard printed instructions, have instructions prepared by personnel experienced in the operation and maintenance of the specific products.
- C. Operating Procedures: Include start-up, break-in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shut-down, and emergency instructions. Include summer, winter, and any special operating instructions.
- D. Maintenance Requirements: Include routine procedures and guide for preventative maintenance and trouble shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.
- E. Provide servicing and lubrication schedule, and list of lubricants required.
- F. Include manufacturer's printed operation and maintenance instructions.
- G. Include sequence of operation by controls manufacturer.
- H. Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.
- I. Additional Requirements: As specified in individual product specification sections.

3.04 ASSEMBLY OF OPERATION AND MAINTENANCE MANUALS

- A. Assemble operation and maintenance data into durable manuals for Owner's personnel use, with data arranged in the same sequence as, and identified by, the specification sections.
- B. Where systems involve more than one specification section, provide separate tabbed divider for each system.
- C. Binders: Commercial quality, 8-1/2 by 11 inch three D side ring binders with durable plastic covers; 2 inch maximum ring size. When multiple binders are used, correlate data into related consistent groupings.
- D. Cover: Identify each binder with typed or printed title OPERATION AND MAINTENANCE INSTRUCTIONS; identify title of Project; identify subject matter of contents.
- E. Project Directory: Title and address of Project; names, addresses, and telephone numbers of Architect, Consultants, CMGC Contractor and subcontractors, with names of responsible parties.
- F. Tables of Contents: List every item separated by a divider, using the same identification as on the divider tab; where multiple volumes are required, include all volumes Tables of Contents in each volume, with the current volume clearly identified.
- G. Dividers: Provide tabbed dividers for each separate product and system; identify the contents on the divider tab; immediately following the divider tab include a description of product and major component parts of equipment.
- H. Text: Manufacturer's printed data, or typewritten data on 20 pound paper.
- I. Drawings: Provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.

3.05 WARRANTIES AND BONDS

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

- B. Verify that documents are in proper form, contain full information, and are notarized.
- C. Co-execute submittals when required.
- D. Retain warranties and bonds until time specified for submittal.
- E. Owner to determine the method of submittal delivery; manual in a commercial quality binder, submitted digitally or a combination of both.
- F. Include originals of each in operation and maintenance manuals, indexed separately on Table of Contents.

END OF SECTION 01 7800

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**SECTION 03 1000
CONCRETE FORMING AND ACCESSORIES**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Formwork for cast-in-place concrete, with shoring, bracing and anchorage.
- B. Openings for other work.
- C. Form stripping.

1.02 RELATED REQUIREMENTS

- A. Section 03 2000 - Concrete Reinforcing.
- B. Section 04 2000 - Unit Masonry: Reinforcement for masonry.
- C. Section 05 1200 - Structural Steel Framing: Placement of embedded steel anchors and plates in cast-in-place concrete.
- D. Section 05 2100 - Steel Joist Framing: Placement of embedded steel anchors, plates and joist seats in cast-in-place concrete.
- E. Section 05 3100 - Steel Decking: Placement of steel anchors in composite decking.

PART 2 PRODUCTS

2.01 FORMWORK - GENERAL

- A. Provide concrete forms, accessories, shoring, and bracing as required to accomplish cast-in-place concrete work.
- B. Design and construct concrete that complies with design with respect to shape, lines, and dimensions.
- C. Comply with applicable state and local codes with respect to design, fabrication, erection, and removal of formwork.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify lines, levels and centers before proceeding with formwork. Ensure that dimensions agree with drawings.

3.02 ERECTION - FORMWORK

- A. Erect formwork, shoring and bracing to achieve design requirements, in accordance with requirements of ACI SPEC-301.
- B. Provide bracing to ensure stability of formwork. Shore or strengthen formwork subject to overstressing by construction loads.

3.03 APPLICATION - FORM RELEASE AGENT

- A. Apply form release agent on formwork in accordance with manufacturer's recommendations.

3.04 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.

3.05 FORM REMOVAL

- A. Do not remove forms or bracing until concrete has gained sufficient strength to carry its own weight and imposed loads.
- B. Loosen forms carefully. Do not wedge pry bars, hammers, or tools against finish concrete surfaces scheduled for exposure to view.

- C. Store removed forms to prevent damage to form materials or to fresh concrete. Discard damaged forms.

END OF SECTION 03 1000

**SECTION 03 1119
INSULATING CONCRETE FORMING**

PART 1 GENERAL

1.01 SECTION INCLUDES

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

1.02 RELATED REQUIREMENTS

- A. Section 03 3000 - Cast-in-Place Concrete: Concrete to be placed into formwork specified in this section.
- B. Section 05 1200 - Structural Steel Framing: Placement of embedded steel anchors and plates in cast-in-place concrete.
- C. Section 05 2100 - Steel Joist Framing: Placement of embedded steel anchors, plates and joist seats in cast-in-place concrete.
- D. Section 05 5000 - Metal Fabrications.

1.03 REFERENCE STANDARDS

- A. ACI CODE-318 - Building Code Requirements for Structural Concrete and Commentary; 2019 (Reapproved 2022).
- B. ACI PRC-347 - Guide to Formwork for Concrete; 2014 (Reapproved 2021).
- C. ACI SPEC-301 - Specifications for Concrete Construction; 2020.
- D. ASTM C177 - Standard Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded-Hot-Plate Apparatus; 2019, with Editorial Revision (2023).
- E. ASTM C203 - Standard Test Methods for Breaking Load and Flexural Properties of Block-Type Thermal Insulation; 2022.
- F. ASTM C578 - Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation; 2023.
- G. ASTM D635 - Standard Test Method for Rate of Burning and/or Extent and Time of Burning of Plastics in a Horizontal Position; 2022.
- H. ASTM D638 - Standard Test Method for Tensile Properties of Plastics; 2022.
- I. ASTM D1621 - Standard Test Method for Compressive Properties of Rigid Cellular Plastics; 2016 (Reapproved 2023).
- J. ASTM D1761 - Standard Test Methods for Mechanical Fasteners in Wood and Wood-Based Materials; 2020.
- K. ASTM D2126 - Standard Test Method for Response of Rigid Cellular Plastics to Thermal and Humid Aging; 2020.
- L. ASTM D2843 - Standard Test Method for Density of Smoke from the Burning or Decomposition of Plastics; 2022.
- M. ASTM D2863 - Standard Test Method for Measuring the Minimum Oxygen Concentration to Support Candle-Like Combustion of Plastics (Oxygen Index); 2023.
- N. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2023d.
- O. ASTM E96/E96M - Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials; 2023.

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 data form materials and installation requirements.
- C. Shop Drawings: Indicate pertinent dimensions, materials, bracing, and arrangement of joints and ties.

1.06 DELIVERY, STORAGE, AND HANDLING

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

1.07 WARRANTY

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

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Fox Blocks; Fox Blocks: www.foxblocks.com/#sle.
- B. Substitutions: See Section 01 6000 - Product Requirements.

2.02 FORMWORK - GENERAL

- A. Provide insulating concrete forms, accessories, shoring, and bracing as required to accomplish insulated cast-in-place concrete work.
- B. Design and construct to provide resultant concrete that complies with design with respect to shape, lines, and dimensions.
- C. Comply with applicable state and local codes with respect to design, fabrication and erection of formwork.
- D. Comply with relevant portions of ACI CODE-318, ACI PRC-347, and ACI SPEC-301.
- E. Bracing, Alignment, and Scaffold System:
 - 1. As an integral installation component of an insulating concrete form system, an adjustable metal scaffolding support and wall alignment system shall be provided.
 - 2. A device with adequate degrees of adjustment to ensure the completed insulating concrete form system walls are plumb after the placement and consolidation of concrete.
 - 3. An OSHA compliant scaffold support system to facilitate proper stacking of forms and placement of concrete.
 - 4. System adequate to reinforce and protect completed insulating concrete form installation prior to the attachment of structural elements to protect from wind damage.

2.03 INSULATING CONCRETE FORMS

- A. Performance Requirements:
 - 1. Thermal Insulance, R-value, of Assembled System: Calculated thermal insulance when tested in accordance with ASTM C177.
 - a. Wall System: 22 deg F hr sq ft, minimum.
 - 2. Sound Transmission Class, Assembled Wall Units: 50, minimum; based on assembly composed of two rigid foam boards separated by an 8 inch concrete core with a finish per the wall types for the exterior and 5/8 inch thick drywall interior.

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

2.04 COMPONENTS

- A. Expanded Polystyrene (EPS) Insulation Boards: Comply with the minimum requirements of ASTM C578, Type II and the specified characteristics below.
 - 1. Thermal Resistance: R-value of 4.0 deg F hr sq ft/Btu, minimum, when tested at 1 inch thickness in accordance with ASTM C177.
 - 2. Water Vapor Permeance: 3.5 perms, maximum, when tested at 1 inch thickness in accordance with ASTM E96/E96M.
 - 3. Tolerances:
 - a. Edge and Face Trueness: 0.03 inch/ft, maximum.
 - b. Length and Width Squareness: 0.06 inch/ft, maximum.
- B. Injection Molded Polypropylene Ties and Profiles:
 - 1. Tensile Strength: 253.3 pounds when tested in accordance with ASTM D638.
 - 2. Ignition Temperature: 400 degrees F.
 - 3. Burn Rate: 0.80 inch per minute when tested in accordance with ASTM D635.
 - 4. Smoke Density: 25.9 percent maximum when tested in accordance with ASTM D2843.
 - 5. Fastener Resistance; ASTM D1761:
 - a. Type W Coarse Thread Drywall Screw Withdrawal Load: 38.42 pounds.
 - b. Type W Coarse Thread Drywall Screw Lateral Resistance Load: 50.56 pounds.
- C. Accessories: Provide the manufacturer's standard items listed below.
 - 1. Opening Blockouts
 - a. Interior Openings: Use wood LVL bucks only.
 - b. Exterior Openings: Use ICF bucks.
 - 2. Sleeves for wall penetrations.
 - 3. Masonry anchors
 - 4. Cover Board: Provide Dens Prime (Minimum 1/4") cover board over ICF as prep for single ply membrane flashing at parapet and ICF wall flashing locations.

2.05 MATERIALS

- A. Concrete, for Use with insulating Concrete Forms: Comply with the applicable requirements of Section 03 3000 and specific requirements listed below.
 - 1. Aggregate:
 - a. Normal weight.
 - b. Size: 3/8 inch to 3/4 inch diameter.
 - 2. Compressive Strength: 4000 pounds per square inch, minimum.
 - 3. Water to Cement Ratio: 0.55 or less.
 - 4. Slump: 5 inches to 7 inches.

PART 3 EXECUTION

3.01 EXAMINATION

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

3.02 PREPARATION

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

3.03 ERECTION - FORMWORK

- A. Erect formwork, shoring and bracing as recommended by the manufacturer. Protect forms from damage.
- B. Erect formwork, shoring and bracing to achieve design requirements. Comply with applicable requirements of ACI SPEC-301.
- C. Brace forms as recommended by manufacturer to ensure stability. Shore or strengthen formwork subject to overstressing by construction loads.
- D. Align joints. Install units in running bond.
- E. Ensure webs and attachment strips are properly aligned.
- F. Install steel reinforcement as insulating concrete form work progresses and as indicated on the structural engineering drawings.
- G. Install alignment system as recommended by manufacturer and as work progresses.

3.04 INSERTS, EMBEDDED PARTS, AND OPENINGS

- A. Remove insulating concrete form material and provide sleeves or other means to create formed openings where required. Cut forms for utility penetrations as needed. Coordinate location of openings for items to be embedded in or pass through concrete work.
- B. Locate and set in place items that will be cast directly into concrete.
- C. Install accessories in accordance with manufacturer's instructions, so they are straight, level, and plumb. Ensure items are not disturbed during concrete placement.

3.05 FORMWORK TOLERANCES

- A. Construct formwork to maintain tolerances required by ACI SPEC-301.

3.06 FIELD QUALITY CONTROL

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

3.07 CLEANING

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

D. Remove snow and ice from within forms. Do not use de-icing salts or solutions.

END OF SECTION 03 1119

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**SECTION 03 2000
CONCRETE REINFORCING**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Reinforcing steel for cast-in-place concrete.
- B. Supports and accessories for steel reinforcement.

1.02 RELATED REQUIREMENTS

- A. Section 03 1119 - Insulating Concrete Forming
- B. Section 03 3000 - Cast-in-Place Concrete.
- C. Section 03 4500 - Precast Architectural Concrete: Reinforcement for precast concrete panels.
- D. Section 04 2000 - Unit Masonry: Reinforcement for masonry.
- E. ACI MNL-66 - ACI Detailing Manual; 2020.

1.03 REFERENCE STANDARDS

- A. ACI CODE-318 - Building Code Requirements for Structural Concrete and Commentary; 2019 (Reapproved 2022).
- B. ACI SPEC-301 - Specifications for Concrete Construction; 2020.
- C. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement; 2022.
- D. ASTM A1064/A1064M - Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete; 2022.
- E. ASTM D3963/D3963M - Standard Specification for Fabrication and Jobsite Handling of Epoxy-Coated Steel Reinforcing Bars; 2021.
- F. AWS D1.4/D1.4M - Structural Welding Code - Steel Reinforcing Bars; 2018, with Amendment (2020).
- G. CRSI (DA4) - Manual of Standard Practice; 2023.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Comply with requirements of ACI MNL-66 Include bar schedules, shapes of bent bars, spacing of bars, and location of splices.

1.05 QUALITY ASSURANCE

- A. Perform work of this section in accordance with ACI SPEC-301.

PART 2 PRODUCTS

2.01 REINFORCEMENT

- A. Reinforcing Steel: ASTM A615/A615M, Grade 60 (60,000 psi).
 - 1. Deformed billet-steel bars.
 - 2. Unfinished.
- B. Steel Welded Wire Reinforcement (WWR): Plain type; ASTM A1064/A1064M.
- C. 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 RE-BAR SPLICING:

- 1. Comply with ACI CODE-318 steel reinforcing design strength requirements for splices in tension and compression.

- B. Coupler Systems: Mechanical devices for splicing reinforcing bars.
- C. Dowel Bar Splicer with Dowel-Ins: Mechanical devices for splicing reinforcing bars.
 - 1. Comply with ACI CODE-318 steel reinforcing design strength requirements for splices in tension and compression.
- D. Taper Tie Hole Plug: Mechanical device for plugging tie holes; anchors optional flush or recessed grout.
- E. Grout: Cementitious, non-metallic, non-shrink grout for use with manufacturer's grout sleeve reinforcing bar coupler system.

2.03 FABRICATION

- A. Fabricate concrete reinforcing in accordance with CRSI (DA4) - Manual of Standard Practice.
- B. Welding of reinforcement is permitted only with the specific approval of Engineer and notification to the Architect. Perform welding in accordance with AWS D1.4/D1.4M.
- C. Fabricate and handle epoxy-coated reinforcing in accordance with ASTM D3963/D3963M.
- D. Locate reinforcing splices not indicated on drawings at point of minimum stress.

PART 3 EXECUTION

3.01 PLACEMENT

- A. Place, support and secure reinforcement against displacement. Do not deviate from required position.
- B. Do not displace or damage vapor barrier.
- C. Accommodate placement of formed openings.
- D. Maintain concrete cover around reinforcing as noted on structural drawings.
- E. Comply with applicable code for concrete cover over reinforcement.

3.02 FIELD QUALITY CONTROL

- A. An independent testing agency, as specified in Section 01 4000 - Quality Requirements, will inspect installed reinforcement for compliance with contract documents before concrete placement.

3.03 SCHEDULES

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

END OF SECTION 03 2000

**SECTION 03 3000
CAST-IN-PLACE CONCRETE**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Removal and replacement of existing concrete
- B. Floors and slabs on grade.
 - 1. Including: Monolithically poured seamless concrete slab (no sawcuts, control, or expansion joints)
- C. Concrete shear walls, foundation walls, and retaining walls.
- D. Concrete reinforcement.
- E. Track curbing
- F. Runways and walk ways
- G. Concrete curing.
- H. Excavation, gravel, and backfill

1.02 RELATED REQUIREMENTS

1.03 REFERENCE STANDARDS

- A. ACI PRC-211.1 - Selecting Proportions for Normal-Density and High Density-Concrete - Guide; 2022.
- B. ACI PRC-308 - Guide to External Curing of Concrete; 2016.
- C. ACI CODE-318 - Building Code Requirements for Structural Concrete and Commentary; 2019 (Reapproved 2022).
- D. ACI PRC-304 - Guide for Measuring, Mixing, Transporting, and Placing Concrete; 2000 (Reapproved 2009).
- E. ACI SPEC-301 - Specifications for Concrete Construction; 2020.
- F. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement; 2022.
- G. ASTM C33/C33M - Standard Specification for Concrete Aggregates; 2023.
- H. ASTM C39/C39M - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens; 2023.
- I. ASTM C857 - Standard Practice for Minimum Structural Design Loading for Underground Precast Concrete Utility Structures; 2019.
- J. ASTM C858 - Standard Specification for Underground Precast Concrete Utility Structures; 2019.
- K. ASTM C891 - Standard Practice for Installation of Underground Precast Concrete Utility Structures; 2020.
- L. ASTM C173/C173M - Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method; 2023.
- M. ASTM C260/C260M - Standard Specification for Air-Entraining Admixtures for Concrete; 2010a (Reapproved 2016).
- N. ASTM C330/C330M - Standard Specification for Lightweight Aggregates for Structural Concrete; 2023.
- O. ASTM C618 - Standard Specification for Coal Ash and Raw or Calcined Natural Pozzolan for Use in Concrete; 2023, with Editorial Revision.

1.04 SUBMITTALS

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

- B. Mix Design: Submit proposed concrete mix design.
 - 1. Indicate proposed mix design complies with requirements of ACI SPEC-301, Section 4 - Concrete Mixtures.
 - 2. Indicate proposed mix design complies with requirements of ACI CODE-318, Chapter 5 - Concrete Quality, Mixing and Placing.
 - 3. Indicate proposed mix design complies with fiber reinforcing manufacturer's written recommendations.
- C. Samples for Pigment Color Selection: Submit manufacturer's complete sample chip set, including pigment number and required dosage rate for each color.
- D. Test Reports: Submit report for each test or series of tests specified.

PART 2 PRODUCTS

2.01 REINFORCEMENT MATERIALS

- A. Reinforcing Steel: ASTM A615/A615M, Grade 60 (60,000 psi).
 - 1. Type: Deformed billet-steel bars.

2.02 CONCRETE MATERIALS

- A. Fine Aggregate: ASTM C33/C33M.
 - 1. Acquire aggregates for entire project from same source.
 - 2. Natural sand, manufactured sand, or combination thereof, washed and screened, consisting of hard durable uncoated particles free of deleterious matter and shall be so graded from course to fine as to produce minimum percentage of voids.
 - 3. Test fine aggregate for reactivity in presence of cement alkalis in accordance with ASTM C289
- B. Course Aggregate: ASTM C33/C33M.
 - 1. Acquire aggregates for entire project from same source.
 - 2. Normal Weight Aggregate: ASTM C33/C33M, gravel or crushed stone suitably washed and screened, and shall consist of hard, durable particles without adherent coatings.
 - 3. Lightweight Aggregate: ASTM C330/C330M, suitably processed, washed and screened, and shall consist of durable particles without adherent coatings.
- C. Fly Ash: ASTM C618, Class C or F.
- D. Precast Concrete Catch Basins: ASTM C858 precast reinforced concrete, designed according to ASTM C857 for structural loading.

2.03 ADMIXTURES

- A. Chemical Admixture: ASTM C260/C260M
- B. Do not use chemicals that will result in soluble chloride ions in excess of 0.1 percent by weight of cement.
- C. Air Entrainment Admixture: ASTM C260/C260M.

2.04 CURING MATERIALS

- A. No curing or Hardening Agents: No curing agents, sealers, or hardener shall be used to aid in curing of concrete. If present these compounds must be removed by shot blasting or scarifying prior to installation of synthetic surface. Chemical curing agents, sealer, or hardeners may have an adverse effect on the adhesion of the synthetic track surface to the concrete base.

2.05 CONCRETE MIX DESIGN

- A. Admixtures: Add acceptable admixtures as recommended in ACI PRC-211.1 and at rates recommended or required by manufacturer.
- B. Normal Weight Concrete:
 - 1. Compressive Strength, when tested in accordance with ASTM C39/C39M at 28 days: As indicated on drawings.
 - 2. Fly Ash Content: Maximum 20 percent of cementitious materials by weight.
 - 3. Water-Cement Ratio: As indicated on structural drawings..

4. Total Air Content: As indicated on structural drawings.
5. Maximum Slump: 3-1/2 inches at point of placement.
6. No water shall be added at job site.

PART 3 EXECUTION

3.01 INSTALLING REINFORCEMENT AND OTHER EMBEDDED ITEMS

- A. Accurately position and support reinforcement, and secure against displacement.

3.02 PLACING CONCRETE

- A. Place concrete in accordance with ACI PRC-304.
- B. Place 4" minimum concrete over 4 inches of ¾ inch crushed aggregate base course.
- C. Locate and install contraction, construction, isolation, and expansion joints as indicated or required.
- D. Place concrete in a continuous operation within planned joints or sections. Do not add water to adjust slump.
- E. Place pre-cast concrete catch basin as indicated and install according to ASTM C891. Connect to existing drainage system if any. Verify existing conditions and report findings to architect.

3.03 CONCRETE FINISHING

- A. Float surfaces to true planes within a tolerance of 1/4 inch in 10 feet (1:480) and medium-to-fine-textured broom finish.
- B. Tool edges and joints to a radius of 1/4 inch (6 mm)

3.04 CURING AND PROTECTION

- A. Comply with requirements of ACI PRC-308. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury.
- B. Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete.

3.05 FIELD QUALITY CONTROL

- A. Owner will employ a testing agency to sample concrete, perform tests, and submit test reports during concrete placement. Every concrete truck shall be tested.
- B. Provide free access to concrete operations at project site and cooperate with appointed firm.

3.06 DEFECTIVE CONCRETE

- A. Defective Concrete: Concrete not complying with required lines, details, dimensions, tolerances or specified requirements.
- B. Repair or replacement of defective concrete will be determined by the Architect. The cost of additional testing shall be borne by CMGC Contractor when defective concrete is identified.
- C. Do not patch, fill, touch-up, repair, or replace exposed concrete except upon express direction of Architect for each individual area.

3.07 PROTECTION

- A. Do not permit traffic over unprotected concrete floor surface for at least 14 days.
- B. Hot Weather: ACI 305R
 1. Reduce temperature of mix ingredients or use an admixture appropriate to job conditions when air temperature is over 75 deg. F.

END OF SECTION 03 3000

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**SECTION 03 4500
PRECAST ARCHITECTURAL CONCRETE**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Architectural precast concrete cap at top of CMU veneer with integral insulation.
- B. Architectural precast concrete accessories.
- C. Supports, anchors, and attachments.

1.02 RELATED REQUIREMENTS

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

1.03 REFERENCE STANDARDS

- A. ACI CODE-318 - Building Code Requirements for Structural Concrete and Commentary; 2019 (Reapproved 2022).
- B. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2019.
- C. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2023.
- D. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement; 2022.
- E. ASTM C1602/C1602M - Standard Specification for Mixing Water Used in the Production of Hydraulic Cement Concrete; 2022.
- F. ASTM C150/C150M - Standard Specification for Portland Cement; 2022.
- G. ASTM C260/C260M - Standard Specification for Air-Entraining Admixtures for Concrete; 2010a (Reapproved 2016).
- H. ASTM C979/C979M - Standard Specification for Pigments for Integrally Colored Concrete; 2016.
- I. PCI MNL-117 - Manual for Quality Control for Plants and Production of Architectural Precast Concrete Products; 2013.
- J. PCI MNL-120 - PCI Design Handbook; 2017, with Errata (2021).
- K. PCI MNL-122 - Architectural Precast Concrete: Fully Revised Manual Including New Sections, Extensive Updates, and Detailed Specifications to Meet Today's Construction Needs.; 2007.
- L. PCI MNL-123 - Connections Manual: Design and Typical Details of Connections for Precast and Prestressed Concrete; 1988.
- M. PCI MNL-135 - Tolerance Manual for Precast and Prestressed Concrete Construction; 2000.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Manufacturer's information on accessory products, including pigments, admixtures, inserts, plates, etc.
- C. Shop Drawings: Indicate layout, unit locations, configuration, unit identification marks, reinforcement, integral insulation, insulated panel system connectors, connection details, support items, location of lifting devices, dimensions, openings, and relationship to adjacent materials. Provide erection drawings.
- D. Samples: Submit two 14" long, 12" _by_ 12" inch in size, illustrating surface finish, color and texture.
- E. Maintenance Data: Indicate surface cleaning instructions.

1.05 QUALITY ASSURANCE

- A. Fabricator Qualifications:

1. Firm having at least 2 years of documented experience in production of precast concrete of the type required.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Handling: Lift and support precast units only from support points.
- B. Protect units to prevent staining, chipping, or spalling of concrete.

PART 2 PRODUCTS

2.01 PRECAST UNITS, GENERAL

- A. Precast Architectural Concrete Units: Comply with PCI MNL-120, PCI MNL-122, PCI MNL-123, PCI MNL-135, and ACI CODE-318.
 1. Concrete Face Mix: Minimum 5000 psi, 28 day strength, air entrained to 5 to 7 percent; comply with ACI SPEC-301.
- B. Finish Type A: Ensure exposed-to-view finish surfaces of precast units are uniform in color and appearance. Replace any units deemed not acceptable by the architect
- C. Hone any exposed to view edges which are rough or otherwise unfinished looking.

2.02 REINFORCEMENT

- A. Reinforcing Steel: ASTM A615/A615M, Grade 60 (60,000 psi).
 1. Deformed billet-steel bars.

2.03 CONCRETE MATERIALS

- A. Cement: ASTM C150/C150M, Type I - Normal Portland type.
- B. Color Additives: Pure, concentrated mineral pigments specifically intended for mixing into concrete and complying with ASTM C979/C979M.
 1. Color(s): As selected by Architect from manufacturer's full range.
- C. Water: ASTM C1602/C1602M; clean, potable, and not detrimental to concrete.
- D. Air Entrainment Admixture: ASTM C260/C260M.

2.04 SUPPORT DEVICES

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

2.05 FABRICATION

- A. Fabricate in compliance with PCI MNL-117 and PCI MNL-135.
- B. Maintain consistent quality during manufacture.
- C. Fabricate connecting devices, plates, angles, items fit to steel framing members, inserts, bolts, and accessories. Fabricate to permit initial placement and final attachment.
- D. Embed reinforcing steel, anchors, inserts plates, angles, and other cast-in items.
- E. Cure units to develop concrete quality, and to minimize appearance blemishes such as non-uniformity, staining, or surface cracking.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that building structure, anchors, devices, and openings are ready to receive work of this section.

3.02 ERECTION

- A. Erect units without damage to shape or finish. Replace or repair damaged panels.
- B. Erect units level and plumb within allowable tolerances.
- C. Fasten units in place with mechanical connections.

3.03 PROTECTION

- A. Protect installed wall caps and window sills from subsequent construction operations.

3.04 SCHEDULES

- A. Profiles: see architectural drawings for profiles.

END OF SECTION 03 4500

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**SECTION 04 2000
UNIT MASONRY**

PART 1 GENERAL

1.01 SECTION INCLUDES

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

1.02 RELATED REQUIREMENTS

- A. Section 05 5000 - Metal Fabrications: Fabricated steel items.
- B. Section 06 1000 - Rough Carpentry: Nailing strips built into masonry.
- C. Section 07 2100 - Thermal Insulation: Insulation for cavity spaces.
- D. Section 07 9200 - Joint Sealants: Sealing control and expansion joints.

1.03 REFERENCE STANDARDS

- A. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2023.
- B. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement; 2022.
- C. ASTM C90 - Standard Specification for Loadbearing Concrete Masonry Units; 2023.
- D. ASTM C91/C91M - Standard Specification for Masonry Cement; 2023.
- E. ASTM C129 - Standard Specification for Nonloadbearing Concrete Masonry Units; 2023.
- F. ASTM C144 - Standard Specification for Aggregate for Masonry Mortar; 2018.
- G. ASTM C150/C150M - Standard Specification for Portland Cement; 2022.
- H. ASTM C207 - Standard Specification for Hydrated Lime for Masonry Purposes; 2018.
- I. ASTM C270 - Standard Specification for Mortar for Unit Masonry; 2019a, with Editorial Revision.
- J. ASTM C404 - Standard Specification for Aggregates for Masonry Grout; 2024.
- K. ASTM C476 - Standard Specification for Grout for Masonry; 2023.
- L. ASTM C1714/C1714M - Standard Specification for Preblended Dry Mortar Mix for Unit Masonry; 2019a.
- M. BIA Technical Notes No. 13 - Ceramic Glazed Brick Exterior Walls; 2017.
- N. TMS 402/602 - Building Code Requirements and Specification for Masonry Structures; 2022, with Errata (2024).

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide data for masonry units, fabricated wire reinforcement, mortar, and masonry accessories.
- C. Samples: Submit two samples of decorative block units to illustrate color, texture, and extremes of color range.

1.05 QUALITY ASSURANCE

- A. Comply with provisions of TMS 402/602, except where exceeded by requirements of Contract Documents.

- B. Installer Qualifications: Company specializing in performing work of the type specified and with at least five years of documented experience.

1.06 MOCK-UPS

- A. Construct a masonry wall as a mock-up panel sized 8 feet long by 6 feet high; include mortar, accessories, structural backup, and flashings (with lap joint, corner, and end dam) in mock-up.
- B. Locate where directed.
- C. Mock-up may remain as part of work.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, handle, and store masonry units by means that will prevent mechanical damage and contamination by other materials.
- B. Handle and store ceramic glazed masonry units in protective cartons or trays. Do not remove from protective packaging until ready for installation.

PART 2 PRODUCTS

2.01 CONCRETE MASONRY UNITS

- A. Concrete Block: Comply with referenced standards and as follows:
 - 1. Size: Standard units with nominal face dimensions of 16 by 8 inches and nominal depths as indicated on drawings for specific locations.
 - 2. Special Shapes: Provide nonstandard blocks configured for corners.
 - a. Provide bullnose units for outside corners.
 - 3. Load-Bearing Units: ASTM C90, medium weight.
 - a. Hollow block.
 - b. Exposed Faces: Special color and texture where indicated.
 - c. Pattern: Split face, standard, scored, and honed units where indicated on drawings.
 - d. Manufacturers:
 - 1) Basis of Design: Sunroc.
 - 2) Amcor; www.amcormasonry.com - Note: Amcor Products manufactured by Old Castle in Idaho Falls are not acceptable products without approval of Architect prior to bidding .
 - 3) Substitutions: See Section 01 6000 - Product Requirements (No pumis block allowed).
 - 4. Nonloadbearing Units: ASTM C129.
 - a. Hollow block, as indicated using split face and honed units.
 - b. Medium weight.
 - c. Pattern: Split face, standard, scored, and honed units where indicated on drawings.
 - d. Color Schedule (as indicated on drawings):
 - 1) Color 1: Natural
 - 2) Color 2: White (Premium Color)
 - 3) Color 3: Black
 - 4) Color 4: Sonoma
 - e. Manufacturers:
 - 1) Basis of Design: Sunroc.
 - 2) Amcor; www.amcormasonry.com - Note: Amcor Products manufactured by Old Castle in Idaho Falls are not acceptable products without approval of Architect prior to bidding.
 - 3) Substitutions: See Section 01 6000 - Product Requirements (No pumis block allowed).

2.02 MORTAR AND GROUT MATERIALS

- A. Masonry Cement: ASTM C91/C91M, Type S.
 - 1. Colored Mortar: Premixed cement as required to match Architect's color sample.

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

2.03 REINFORCEMENT AND ANCHORAGE

- A. Reinforcing Steel: ASTM A615/A615M, Grade 60 (60,000 psi), deformed billet bars; uncoated.
- B. Masonry Veneer Anchors: 2-piece anchors that permit differential movement between masonry veneer and structural backup, hot dip galvanized to ASTM A 153/A 153M, Class B.
 - 1. Anchor plates: Not less than 0.075 inch thick, designed for fastening to structural backup through sheathing by two fasteners; provide design with legs that penetrate sheathing and insulation to provide positive anchorage.
 - 2. Wire ties: Manufacturer's standard shape, 0.1875 inch thick.
 - 3. Vertical adjustment: Not less than 3-1/2 inches.
- C. Metal-to-Metal Fasteners: Self-drilling, self-tapping screws; corrosion resistant finish or hot dip galvanized to ASTM A153/A153M.

2.04 FLASHINGS

- A. Membrane Asphaltic Flashing Materials:
 - 1. Rubberized Asphalt Flashing: Self-adhering polymer modified asphalt sheet; 40 mils (0.040 inch) minimum total thickness; 8 mil cross-laminated polyethylene bonded to adhesive rubberized asphalt, with a removable release liner.
 - a. Manufacturers:
 - 1) Carlisle Coatings & Waterproofing; Standard; CCW-705 Air & Vapor Barrier: Low-Temp; CCW-705LT Air & Vapor Barrier.
 - 2) Substitutions: See Section 01 6000 - Product Requirements.
- B. Factory-Fabricated Flashing Corners and End Dams: Stainless steel.
- C. Flashing Sealant/Adhesives: Silicone, polyurethane, or silyl-terminated polyether/polyurethane or other type required or recommended by flashing manufacturer; type capable of adhering to type of flashing used.
- D. Lap Sealants and Tapes: As recommended by flashing manufacturer; compatible with membrane and adhesives.

2.05 ACCESSORIES

- A. Cavity Mortar Control: Semi-rigid polyethylene or polyester mesh panels, sized to thickness of wall cavity, and designed to prevent mortar droppings from clogging weeps and cavity vents and allow proper cavity drainage.
 - 1. Mortar Diverter: Semi-rigid mesh designed for installation at flashing locations.
- B. Weeps:

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

2.06 MORTAR AND GROUT MIXING

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

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that field conditions are acceptable and are ready to receive masonry.
- B. Verify that related items provided under other sections are properly sized and located.

3.02 PREPARATION

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

3.03 COLD AND HOT WEATHER REQUIREMENTS

- A. Comply with requirements of TMS 402/602 or applicable building code, whichever is more stringent.

3.04 COURSING

- A. Establish lines, levels, and coursing indicated. Protect from displacement.
- B. Maintain masonry courses to uniform dimension. Form vertical and horizontal joints of uniform thickness.
- C. Concrete Masonry Units:
 - 1. Bond: Running.
 - 2. Coursing: One unit and one mortar joint to equal 8 inches.
 - 3. Mortar Joints: Raked at scored CMU, concave at all other CMU.

3.05 PLACING AND BONDING

- A. Lay hollow masonry units with face shell bedding on head and bed joints.
- B. Buttering corners of joints or excessive furrowing of mortar joints is not permitted.
- C. Remove excess mortar and mortar smears as work progresses.
- D. Remove excess mortar with water repellent admixture promptly. Do not use acids, sandblasting or high pressure cleaning methods.
- E. Interlock intersections and external corners.
- F. Do not shift or tap masonry units after mortar has achieved initial set. Where adjustment must be made, remove mortar and replace.
- G. Perform job site cutting of masonry units with proper tools to provide straight, clean, unchipped edges. Prevent broken masonry unit corners or edges.
- H. Cut mortar joints flush where resilient base is scheduled.
- I. Isolate masonry partitions from vertical structural framing members with a control joint as indicated.

3.06 WEEPS/CAVITY VENTS

- A. Install weeps in veneer and cavity walls at 24 inches on center horizontally on top of through-wall flashing above shelf angles and lintels and at bottom of walls.

3.07 CAVITY MORTAR CONTROL

- A. Do not permit mortar to drop or accumulate into cavity air space or to plug weep/cavity vents.
- B. 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.

3.08 REINFORCEMENT AND ANCHORAGE - GENERAL, SINGLE WYTHE MASONRY, AND CAVITY WALL MASONRY

- A. See Structural Drawings.

3.09 REINFORCEMENT AND ANCHORAGE - MASONRY VENEER

- A. As noted on structural drawings.

3.10 LINTELS

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

3.11 CONTROL AND EXPANSION JOINTS

- A. Do not continue horizontal joint reinforcement through control or expansion joints unless shown otherwise on structural drawings.
- B. Size control joints as indicated on drawings; if not indicated, 3/4 inch wide and deep.

3.12 BUILT-IN WORK

- A. As work progresses, install built-in metal door frames and glazed frames and other items to be built into the work and furnished under other sections.
- B. Install built-in items plumb, level, and true to line.
- C. Bed anchors of metal door frames in adjacent mortar joints. Fill frame voids solid with grout.
- D. Wall mounted accessories: Provide a honed or scored faced unit at all wall mounted accessories (duplex outlets, light switches, fire alarm devices, speakers and etc) to provide a smooth surface to attach to.

3.13 TOLERANCES

- A. Maximum Variation From Unit to Adjacent Unit: 1/16 inch.
- B. Maximum Variation from Plane of Wall: 1/4 inch in 10 ft and 1/2 inch in 20 ft or more.
- C. Maximum Variation from Level Coursing: 1/8 inch in 3 ft and 1/4 inch in 10 ft; 1/2 inch in 30 ft.

3.14 CUTTING AND FITTING

- A. As needed.

3.15 CLEANING

- A. Remove excess mortar and mortar droppings.
- B. Clean soiled surfaces with cleaning solution.

3.16 PROTECTION

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

END OF SECTION 04 2000

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**SECTION 05 1200
STRUCTURAL STEEL FRAMING**

PART 1 GENERAL

1.01 SECTION INCLUDES

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

1.02 REFERENCE STANDARDS

- A. AISC (MAN) - Steel Construction Manual; 2023.
- B. AISC 303 - Code of Standard Practice for Steel Buildings and Bridges; 2022.
- C. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2019.
- D. ASTM A108 - Standard Specification for Steel Bar, Carbon and Alloy, Cold-Finished; 2018.
- E. ASTM A307 - Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength; 2021.
- F. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes; 2023.
- G. ASTM A501/A501M - Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing; 2021.
- H. ASTM A563/A563M - Standard Specification for Carbon and Alloy Steel Nuts (Inch and Metric); 2021a.
- I. ASTM A992/A992M - Standard Specification for Structural Steel Shapes; 2022.
- J. 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; 2023.
- K. ASTM F436/F436M - Standard Specification for Hardened Steel Washers Inch and Metric Dimensions; 2019.
- L. ASTM F959/F959M - Standard Specification for Compressible-Washer-Type Direct Tension Indicators for Use with Structural Fasteners, Inch and Metric Series; 2017a.
- M. ASTM F1554 - Standard Specification for Anchor Bolts, Steel, 36, 55, and 105-ksi Yield Strength; 2020.
- N. 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; 2023.
- O. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination; 2020.
- P. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2020, with Errata (2023).
- Q. RCSC (HSBOLT) - Specification for Structural Joints Using High-Strength Bolts; Research Council on Structural Connections; 2020.
- R. SSPC-SP 3 - Power Tool Cleaning; 2018.
- S. UL (FRD) - Fire Resistance Directory; Current Edition.

1.03 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings:
 - 1. Indicate profiles, sizes, spacing, locations of structural members, openings, attachments, and fasteners.

2. Connections not detailed.
 3. Indicate welded connections with AWS A2.4 welding symbols. Indicate net weld lengths.
- C. Manufacturer's Mill Certificate: Certify that products meet or exceed specified requirements.
- D. Fabricator Test Reports: Comply with ASTM A1011/A1011M.

1.04 QUALITY ASSURANCE

- A. Fabricate structural steel members in accordance with AISC (MAN) "Steel Construction Manual."
- B. Fabricator: Company specializing in performing the work of this section with minimum years (5) years of documented experience.
- C. Erector: Company specializing in performing the work of this section with minimum five (5) years of documented experience.

PART 2 PRODUCTS

2.01 REGULATORY REQUIREMENTS

- A. Comply with UL (FRD) Assembly Design No. P 719.

2.02 MATERIALS

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

2.03 FABRICATION

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

2.04 FINISH

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

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that conditions are appropriate for erection of structural steel and that the work may properly proceed.

3.02 ERECTION

- A. Erect structural steel in compliance with AISC 303.
- B. Allow for erection loads and provide sufficient temporary bracing to maintain structure in safe condition, plumb, and in true alignment until completion of erection and installation of permanent bracing.
- C. Field weld components and shear studs indicated on shop drawings.
- D. Use carbon steel bolts only for temporary bracing during construction, unless otherwise specifically permitted on drawings. Install high-strength bolts in accordance with RCSC (HSBOLT) "Specification for Structural Joints Using High-Strength Bolts".
- E. Do not field cut or alter structural members without approval of Architect.
- F. After erection, prime welds, abrasions, and surfaces not shop primed, except surfaces to be in contact with concrete.
- G. Grout solidly between column plates and bearing surfaces, complying with manufacturer's instructions for nonshrink grout. Trowel grouted surfaces smooth, splaying neatly to 45 degrees.

3.03 TOLERANCES

- A. Maximum Variation From Plumb: 1/4 inch per story, non-cumulative.
- B. Maximum Offset From True Alignment: 1/4 inch.

3.04 FIELD QUALITY CONTROL

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

END OF SECTION 05 1200

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**SECTION 05 1213
ARCHITECTURALLY-EXPOSED STRUCTURAL STEEL FRAMING**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Additional requirements for structural steel members designated as architecturally-exposed structural steel (AESS).

1.02 RELATED REQUIREMENTS

- A. Section 05 1200 - Structural Steel Framing: General requirements for structural steel members, including AESS framing specified in this section.
- B. Section 09 9113 - Exterior Painting: Finish coat requirements and coordination with primer and surface preparation specified in this section.
- C. Section 09 9123 - Interior Painting: Finish coat requirements and coordination with primer and surface preparation specified in this section.
- D. Section 09 9600 - High-Performance Coatings: Finish coat requirements and coordination with primer and surface preparation specified in this section.

1.03 REFERENCE STANDARDS

- A. AISC 303 - Code of Standard Practice for Steel Buildings and Bridges; 2022.
- B. AISC 360 - Specification for Structural Steel Buildings; 2022.
- C. ASTM A6/A6M - Standard Specification for General Requirements for Rolled Structural Steel Bars, Plates, Shapes, and Sheet Piling; 2023.
- D. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes; 2023.
- E. ASTM A1085/A1085M - Standard Specification for Cold-Formed Welded Carbon Steel Hollow Structural Sections (HSS); 2015.
- F. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination; 2020.
- G. SSPC-SP 1 - Solvent Cleaning; 2015, with Editorial Revision (2016).
- H. SSPC-SP 6 - Commercial Blast Cleaning; 2007.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product data for each type of product specified. Submit paint systems in accordance with Section 09 9113.
- C. Shop Drawings: Detailing for fabrication of AESS components.
 - 1. Provide erection documents clearly indicating which members are AESS members and the AESS category of each part.
 - 2. Include details that clearly identify AESS requirements found in this specification. Provide connections for AESS consistent with concepts shown on drawings.
 - 3. Indicate welds by AWS A2.4 symbols, distinguishing between shop and field welds, and show size, length and type of each weld. Identify grinding, finish and profile of welds as defined by the designated AESS category.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Handle finished pieces in accordance with Section 10 of AISC 303, using nylon-type slings, or chains with softeners, or wire ropes with softeners such that they are not damaged.
- B. Store materials to permit easy access for inspection and identification. Keep steel members off ground by using pallets, platforms, or other supports. Protect steel members and packaged materials from erosion and deterioration. Use special care in handling to prevent twisting or warping of AESS members.

PART 2 PRODUCTS

2.01 GENERAL REQUIREMENTS

- A. Comply with Section 05 1200, except as amended in this section for aesthetic purposes.

2.02 FABRICATION

- A. Fabricate and assemble AESS in shop to greatest extent possible. Locate field joints in AESS assemblies at concealed locations or as approved by Architect. Detail AESS assemblies to minimize field handling and expedite erection.
- B. Permissible tolerances for member depth, width, out of square, and camber and sweep to be as specified in ASTM A6/A6M, ASTM A500/A500M, and ASTM A1085/A1085M.
- C. Use special care in handling and shipping of AESS both before and after shop painting to minimize damage to any shop finish. Use nylon-type slings or softeners when using chains or wire rope slings.
- D. Fabricate AESS in accordance with categories defined in AISC 303, as follows:

2.03 PAINT SYSTEM

- A. Compatibility: All components/procedures of AESS paint system to comply with coating system specified, submitted, and approved per Sections 09 9113, 09 9123, and 09 9600. As a minimum, identify required surface preparation, primer, intermediate coat (if applicable), and finish coat. Primer, intermediate coating, and finish coating to be from a single manufacturer combined in a system documented by manufacturer with adequate guidance for fabricator to procure and execute.
- B. Primer: As specified in Sections 09 9113, 09 9123, and 09 9600. Primer to comply with all federal standards for VOC, lead and chromate levels.

2.04 SHOP PRIMING

- A. Surface Preparation:
 - 1. Provide surface preparations to meet SSPC-SP 6.
 - 2. Coordinate required surface profile with approved paint submittal prior to beginning surface preparation.
 - 3. Prior to blasting, remove any grease and oil using solvent cleaning to meet SSPC-SP 1.
 - 4. Remove weld spatter, slivers and similar surface discontinuities.
 - 5. Ease sharp corners resulting from shearing, flame cutting or grinding.
- B. 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. Use priming methods that result in full coverage of joints, corners, edges, and exposed surfaces.

2.05 MATERIALS

- A. General: Meet requirements of 05 1200 as amended below.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Erector to check all AESS members upon delivery for twist, kinks, gouges or other imperfections which may result in rejection of appearance of member. Coordinate remedial action with fabricator prior to erecting steel.

3.02 PREPARATION

- A. Provide connections for temporary shoring, bracing and supports only where noted on approved fabrication documents. Temporary connections not shown are to be made at locations not exposed to view in final structure or as approved by Architect.
- B. Handle, lift and align pieces using nylon straps or chains with softeners required to maintain appearance of AESS through process of erection.

3.03 CLEANING

- A. Touch-up Painting: Complete cleaning and touch-up painting of field welds, bolted connections, and abraded areas of shop paint to blend with adjacent surfaces of AESS. Perform touch-up work in accordance with manufacturer's instructions and as specified in Section 09 9113, 09 9123, and 09 9600.

END OF SECTION 05 1213

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**SECTION 05 2100
STEEL JOIST FRAMING**

PART 1 GENERAL

1.01 SECTION INCLUDES

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

1.02 REFERENCE STANDARDS

- A. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2019.
- B. ASTM A108 - Standard Specification for Steel Bar, Carbon and Alloy, Cold-Finished; 2018.
- 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; 2023.
- E. ASTM A307 - Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength; 2021.
- 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 (2023).
- H. IAS AC172 - Accreditation Criteria for Fabricator Inspection Programs for Structural Steel AC172; 2019.
- 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. UL (FRD) - Fire Resistance Directory; Current Edition.

1.03 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Indicate standard designations, joist coding, configurations, sizes, spacings, cambers, locations of joists, joist leg extensions, bridging, connections, and attachments.
- C. Manufacturer's Qualification Statement.

1.04 QUALITY ASSURANCE

- A. Design connections not detailed on drawings under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed in Utah.
- B. Design and Installation Requirements: Comply with UL (FRD) Assembly Design No. P 719.
- C. Manufacturer Qualifications: Company specializing in performing the work of this section with minimum ten (10) years documented experience.
- D. Erector Qualifications: Company specializing in performing the work of this section with minimum three (3) years documented experience.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Transport, handle, store, and protect products to SJL requirements.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Open Web Joists: Types as indicated on drawings:
 - 1. Provide top chord extensions as indicated.
 - 2. Minimum End Bearing on Steel Supports: Comply with referenced SJL standard.
 - 3. Minimum End Bearing on Concrete or Masonry Supports: As shown on drawings.

4. Finish: Shop primed.
- B. Anchor Bolts, Nuts and Washers: ASTM A307 hot-dip galvanized per ASTM A153/A153M Class C.
- C. Shear Stud Connectors: Made from ASTM A108 Grade 1015 bars.
- D. Structural Steel For Supplementary Framing and Joist Leg Extensions: ASTM A36/A36M.
- E. Welding Materials: AWS D1.1/D1.1M; type required for materials being welded.
- F. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.
- G. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20 Type I - Inorganic, complying with VOC limitations of authorities having jurisdiction.

2.02 FABRICATION

- A. Frame special sized openings in joist web framing as detailed.

2.03 FINISH

- A. Shop prime joists as specified.
 1. Do not prime surfaces that will be fireproofed.
- B. Prepare surfaces to be finished in accordance with SSPC-SP 2.
- C. Galvanizing: Provide minimum 1.7 oz/sq ft galvanized coating to ASTM A123/A123M requirements.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify existing conditions prior to beginning work.

3.02 ERECTION

- A. Erect joists with correct bearing on supports.
- B. Allow for erection loads. Provide sufficient temporary bracing to maintain framing safe, plumb, and in true alignment.
- C. Coordinate the placement of anchors for securing loose bearing members furnished as part of the work of this section.
- D. After joist alignment and installation of framing, field weld joist seats to steel bearing surfaces.
- E. Position and field weld joist chord extensions and wall attachments as detailed.
- F. Install supplementary framing for roof openings greater than 18 inches.
- G. Do not permit erection of decking until joists are braced, bridged, and secured or until completion of erection and installation of permanent bridging and bracing.
- H. Do not field cut or alter structural members without approval of joist manufacturer.
- I. After erection, prime welds, damaged shop primer, damaged galvanizing, and surfaces not shop primed, except surfaces specified not to be primed.

3.03 TOLERANCES

- A. Maximum Variation From Plumb: 1/4 inch.
- 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. as noted on the Structural Drawings.

END OF SECTION 05 2100

**SECTION 05 3100
STEEL DECKING**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Acoustical roof deck.
- B. Roof deck.
- C. Composite floor deck.
- D. Bearing plates and angles.
- E. Stud shear connectors.
- F. Acoustical insulation in roof deck flutes.

1.02 RELATED REQUIREMENTS

- A. Section 05 1200 - Structural Steel Framing: Support framing for openings larger than 12 inches and shear stud connectors.
- B. Section 05 2100 - Steel Joist Framing: Support framing for openings larger than 12 inches.
- C. Section 07 8100 - Applied Fire Protection: Spray applied fireproofing.

1.03 REFERENCE STANDARDS

- A. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2019.
- 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; 2023.
- 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; 2023, with Editorial Revision.
- E. ASTM B633 - Standard Specification for Electrodeposited Coatings of Zinc on Iron and Steel; 2023.
- F. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2020, with Errata (2023).
- G. AWS D1.3/D1.3M - Structural Welding Code - Sheet Steel; 2018, with Errata (2022).
- H. SDI (DM) - Publication No.30, Design Manual for Composite Decks, Form Decks, and Roof Decks; 2007.
- 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. UL (FRD) - Fire Resistance Directory; Current Edition.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittals procedures.
- B. Shop Drawings: Indicate deck plan, support locations, projections, openings, reinforcement, pertinent details, and accessories.
- C. Product Data: Provide deck profile characteristics, dimensions, structural properties, and finishes.
- D. Certificates: Certify that products furnished meet or exceed specified requirements.
- E. Submit manufacturer's installation instructions.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Cut plastic wrap to encourage ventilation.
- B. Separate sheets and store deck on dry wood sleepers; slope for positive drainage.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Steel Deck:
 - 1. Canam Steel Corporation; None - N/A: www.canam-steeljoists.ws.
 - 2. Cordeck, Inc; None - N/A: www.cordeck.com/#sle.
 - 3. Nucor-Vulcraft Group; None - N/A: www.vulcraft.com/#sle.
 - 4. Verco, Nucor: www.vercodeck.com.
 - 5. Substitutions: See Section 01 6000 - Product Requirements.

2.02 STEEL DECK

- A. See Structural Notes on drawings.
- 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. Galvanized Steel Sheet: ASTM A653/A653M, Structural Steel (SS) Grade 33/230, with G90/Z275 galvanized coating.
 - 2. Primer: Shop coat of manufacturer's standard primer paint over cleaned and phosphatized substrate.
 - 3. Structural Properties:
 - a. See Structural Notes on drawings.
 - 4. Install at Cafetorium, Gym, 2nd floor Collaboration area, Wood shop, Metal shop, and Weight room.
- C. Roof Deck: Non-composite type, fluted steel sheet:
 - 1. Galvanized Steel Sheet: ASTM A653/A653M, Structural Steel (SS) Grade 50/340, Class 1, 2, or 4, with G90/Z275 galvanized coating.
 - 2. Primer: Shop coat of manufacturer's standard primer paint over cleaned and phosphatized substrate.
 - 3. Structural Properties:
 - a. See Structural Notes on drawings.
 - 4. Fire Resistance Classification: Comply with UL (FRD) Assembly Number P 719.
- D. Composite Floor Deck: Fluted steel sheet embossed to interlock with concrete:
 - 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. Structural Properties:
 - a. See Structural Notes on drawings.

2.03 ACCESSORY MATERIALS

- A. Bearing Plates and Angles: ASTM A36/A36M steel, unfinished.
- B. Stud Shear Connectors: Made from ASTM A108 Grade 1015 bars.
- C. Welding Materials: AWS D1.1/D1.1M.
- D. Fasteners: Galvanized hardened steel, self tapping.
- E. Mechanical Fasteners: Steel; hex washer head, self-drilling, self-tapping.
 - 1. Fasteners for Steel Roof Decks Protected with Waterproofing Membrane: ASTM B633, SC1, Type III zinc electroplate.
- F. Weld Washers: Mild steel, uncoated, 3/4 inch outside diameter, 1/8 inch thick.
- G. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.
- H. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20, complying with VOC limitations of authorities having jurisdiction.
- I. Flute Closures: Closed cell foam rubber, 1 inch thick; profiled to fit tight to the deck.
- J. Acoustical Insulation: Glass fiber type, minimum 1.1 lb/cu ft density; profiled to suit deck.

2.04 FABRICATED DECK ACCESSORIES

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

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify existing conditions prior to beginning work.

3.02 INSTALLATION

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

END OF SECTION 05 3100

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**SECTION 05 4000
COLD-FORMED METAL FRAMING**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Formed steel stud exterior wall and interior wall framing.
- B. Exterior wall sheathing.
- C. Formed steel joist and purlin framing and bridging.

1.02 RELATED REQUIREMENTS

- A. Section 04 2613 - 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 - Thermal Insulation: Insulation within framing members.
- E. Section 07 6200 - Sheet Metal Flashing and Trim: Head and sill flashings.
- F. Section 07 9200 - Joint Sealants.
- G. Section 09 2116 - Gypsum Board Assemblies: Gypsum-based sheathing.
- H. Section 09 5100 - 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 (2020).
- B. AISI S240 - North American Standard for Cold-Formed Steel Structural Framing; 2015, with Errata (2020).
- C. ASCE 7 - Minimum Design Loads and Associated Criteria for Buildings and Other Structures; Most Recent Edition Cited by Referring Code or Reference Standard.
- D. ASTM A1003/A1003M - Standard Specification for Steel Sheet, Carbon, Metallic- and Nonmetallic-Coated for Cold-Formed Framing Members; 2015.
- E. ASTM C578 - Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation; 2023.
- F. ASTM C1007 - Standard Specification for Installation of Load Bearing (Transverse and Axial) Steel Studs and Related Accessories; 2020.
- G. ASTM C1289 - Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board; 2023a.
- H. ASTM C1396/C1396M - Standard Specification for Gypsum Board; 2017.
- I. ICC (IBC) - International Building Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- J. AWS D1.3/D1.3M - Structural Welding Code - Sheet Steel; 2018, with Errata (2022).

1.04 ADMINISTRATIVE REQUIREMENTS

1.05 SUBMITTALS

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

PART 2 PRODUCTS

2.01 PERFORMANCE REQUIREMENTS

- A. Design Requirements: Design cold-formed framing systems, components and connectors to withstand specified design loads in compliance with ICC (IBC), ASCE 7, AISI S100, and AISI S240.

2.02 MATERIALS

- A. Steel Sheet: ASTM A1003/A1003M, subject to the ductility limitations indicated in AISI S240.

- B. Wall Studs and Track Sections: AISI S240; c-shaped studs and u-shaped track sections in stud-matching nominal width and compatible height.

2.03 STRUCTURAL FRAMING COMPONENTS

2.04 MISCELLANEOUS CONNECTIONS

- A. Self-Drilling, Self-Tapping Screws, Bolts, Nuts and Washers: Hot-dip galvanized per ASTM A153/A153M.
- B. Anchorage Devices: Powder actuated.

2.05 SHEATHING

- A. Gypsum Board Wall Sheathing: See Section 09 2116.

PART 3 EXECUTION

3.01 INSTALLATION - GENERAL

- A. Install structural members and connections in compliance with ASTM C1007.

3.02 INSTALLATION OF STUDS

- A. Install load-bearing studs full length in one piece. Splicing of studs is not permitted.
- B. Install intermediate studs above and below openings to align with wall stud spacing.
- C. Provide deflection allowance in stud track, directly below horizontal building framing at non-loadbearing framing.

3.03 INSTALLATION OF JOISTS AND PURLINS

- A. Place joists at 16 inches on center; not more than 2 inches from abutting walls, and connect joists to supports using fastener method.

3.04 INSTALLATION OF WALL SHEATHING

- A. Install wall sheathing with long dimension perpendicular to wall studs, with ends over firm bearing and staggered, using self-tapping screws.
 - 1. Provide steel diagonal bracing at corners with foam insulation or gypsum board wall sheathing.

END OF SECTION 05 4000

**SECTION 05 5000
METAL FABRICATIONS**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Shop fabricated steel items.
- B. Prefabricated ladders and ship ladders.
- C. Steel framing and supports for countertops.

1.02 RELATED REQUIREMENTS

- A. Section 05 1200 - Structural Steel Framing: Structural steel column anchor bolts.
- B. Section 05 2100 - Steel Joist Framing: Structural joist bearing plates, including anchorage.
- C. Section 05 3100 - Steel Decking: Bearing plates for metal deck bearing, including anchorage.
- D. Section 05 5100 - Metal Stairs.
- E. Section 05 5213 - Pipe and Tube Railings.
- F. Section 06 4100 - Architectural Wood Casework
- G. Section 09 9113 - Exterior Painting: Paint finish.
- H. Section 09 9123 - Interior Painting: Paint finish.

1.03 REFERENCE STANDARDS

- A. ANSI A14.3 - American National Standard for Ladders -- Fixed -- Safety Requirements; 2008 (Reaffirmed 2018).
- B. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2019.
- C. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless; 2022.
- D. ASTM A283/A283M - Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates; 2018.
- E. ASTM A307 - Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength; 2021.
- F. ASTM A501/A501M - Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing; 2021.
- G. 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; 2023.
- H. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination; 2020.
- I. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2020, with Errata (2023).
- 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.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories. Include erection drawings, elevations, and details where applicable.
 - 1. Indicate welded connections using standard AWS A2.4 welding symbols. Indicate net weld lengths.

PART 2 PRODUCTS

2.01 MATERIALS - STEEL

- A. Steel Sections: ASTM A36/A36M.

- B. Steel Tubing: ASTM A501/A501M hot-formed structural tubing.
- C. Plates: ASTM A283/A283M.
- D. Pipe: ASTM A53/A53M, Grade B Schedule 40, black finish.
- E. Bolts, Nuts, and Washers: ASTM A307, Grade A, plain.
- F. Welding Materials: AWS D1.1/D1.1M; type required for materials being welded.
- G. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.
- H. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20, Type I - Inorganic, complying with VOC limitations of authorities having jurisdiction.

2.02 FABRICATION

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

2.03 FABRICATED ITEMS

- A. Ladders: Steel; in compliance with ANSI A14.3; with mounting brackets and attachments; prime paint finish.
 - 1. Side Rails: 1/2 x 2 inches members spaced at 18 inches.
 - 2. Rungs: one inch diameter solid round knurled bar spaced 12 inches on center.
 - 3. Space rungs 7 inches from wall surface.
- B. Ledge Angles, Shelf Angles, Channels, and Plates Not Attached to Structural Framing: For support of metal decking; prime paint finish.
- C. Lintels: As detailed; prime paint finish.
- D. Door Frames for Overhead Door Openings and Wall Openings: Channel and Angle sections; prime paint finish.
- E. Steel Counter Support Brackets: Made from 2 x 2 x 1/4 inch angles secured to the floor system. The vertical leg of the support embedded within the wall assembly and the horizontal leg protruding from the wall to receive the countertop. See drawings for complete detail.

2.04 FINISHES - STEEL

- A. Prime paint steel items.
 - 1. Exceptions: Galvanize items to be embedded in concrete and items to be embedded in masonry.
 - 2. Exceptions: Do not prime surfaces in direct contact with concrete, where field welding is required, and items to be covered with sprayed fireproofing.
- B. Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.
- C. Prime Painting: One coat. Apply two coats to surfaces which are inaccessible after assembly or erection.
- D. Powder coat exterior handrails, ladders, and interior countertop support brackets. Thermosetting polyester 1.5 mils cured film thickness. Color to be selected by architect from manufactures full range of colors.

2.05 FABRICATION TOLERANCES

- A. Squareness: 1/8 inch maximum difference in diagonal measurements.
- B. Maximum Offset Between Faces: 1/16 inch.
- C. Maximum Misalignment of Adjacent Members: 1/16 inch.

- D. Maximum Bow: 1/8 inch in 48 inches.
- E. Maximum Deviation From Plane: 1/16 inch in 48 inches.

PART 3 EXECUTION

3.01 EXAMINATION

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

3.02 PREPARATION

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

3.03 INSTALLATION

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

3.04 TOLERANCES

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

END OF SECTION 05 5000

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**SECTION 05 5100
METAL STAIRS**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Stairs with concrete treads.
- B. Structural steel stair framing and supports.
- C. Handrails and guards.

1.02 RELATED REQUIREMENTS

- A. Section 03 3000 - Cast-in-Place Concrete: Placement of metal anchors in concrete.
- B. Section 04 2000 - Unit Masonry: Placement of metal fabrications in masonry.
- C. Section 09 9123 - Interior Painting: Paint finish.

1.03 REFERENCE STANDARDS

- A. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.
- B. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2019.
- C. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless; 2022.
- D. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2023.
- E. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes; 2023.
- F. ASTM A501/A501M - Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing; 2021.
- G. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Required Hardness, Solution Hardened, and Bake Hardenable; 2023, with Editorial Revision.
- 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; 2023.
- I. 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; 2023.
- J. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination; 2020.
- K. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2020, with Errata (2023).
- L. SSPC-Paint 15 - Steel Joist Shop Primer/Metal Building Primer; 2004.
- M. SSPC-SP 2 - Hand Tool Cleaning; 2018.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories.
 - 1. Indicate welded connections using standard AWS A2.4 welding symbols. Indicate net weld lengths.

1.05 QUALITY ASSURANCE

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

1. A company specializing in manufacturing products specified in this section, with not less than five years of documented experience.

PART 2 PRODUCTS

2.01 METAL STAIRS - GENERAL

- A. Metal Stairs: Provide stairs of the design specified, complete with landing platforms, vertical and horizontal supports, railings, and guards, fabricated accurately for anchorage to each other and to building structure.
 1. Regulatory Requirements: Provide stairs and railings that comply with most stringent requirements of local, state, and federal regulations; where requirements of Contract Documents exceed those of regulations, comply with Contract Documents.
 2. Handrails: Comply with applicable accessibility requirements of ADA Standards.
 3. Dimensions: As indicated on drawings.
 4. Shop assemble components; disassemble into largest practical sections suitable for transport and access to site.
 5. No sharp or rough areas on exposed travel surfaces and surfaces accessible to touch.
 6. Separate dissimilar metals using paint or permanent tape.
- B. Metal Jointing and Finish Quality Levels:
 1. Architectural: All joints as inconspicuous as possible, whether welded or mechanical.
 - a. Welded Joints: Continuously welded and ground smooth and flush.
 - b. Mechanical Joints: Butted tight, flush, and hairline; concealed fastenings only.
 - c. Exposed Edges and Corners: Eased to small uniform radius.
 - d. Metal Surfaces to be Painted: Sanded or ground smooth, suitable for highest quality gloss finish.
- C. Fasteners: Same material or compatible with materials being fastened; type consistent with design and specified quality level.
- D. Anchors and Related Components: Same material and finish as item to be anchored, except where specifically indicated otherwise; provide all anchors and fasteners required.

2.02 METAL STAIRS WITH ULTRA COMPACT SURFACE (UCS)

- A. Jointing and Finish Quality Level: Architectural, as defined above.
- B. Risers: Closed.
- C. Treads: Metal pan with field-installed concrete fill.
 1. UCS Tread Thickness: 20 mm
 2. Tread Pan Material: Steel sheet.
 3. Tread Pan Thickness: As required by design; 14 gauge, 0.075 inch minimum.
 4. Pan Anchorage to Stringers: Welded to carrier angles welded to stringers.
- D. Risers: Same material and thickness as tread pans.
 1. Nosing Depth: 0". Nosing projection by UCS Treads, see details on drawings.
 2. Nosing Return: 0". Nosing projection by UCS Treads, see details on drawings.
- E. Stringers: HSS (Hollow Steel Sections) or Steel Channel as indicated on drawings..
 1. End Closure: Sheet steel of same thickness as risers welded across ends.
- F. Landings: Corrugated steel decking, supported and reinforced as required to achieve design load capacity. Welded wire mesh reinforced concrete held below top of steel sufficient to receive full mortar bed with Ultra Compact Surfacing (UCS) finished landing. UCS finish to flush out with top of perimeter steel structure.
- G. Railings: Steel pipe railings.
- H. Finish: Shop- or factory-prime, field painted.

2.03 HANDRAILS AND GUARDS

- A. Wall-Mounted Rails: Stainless Steel Tube.
 1. Outside Diameter: 1-1/4 inch, minimum, to 1-1/2 inches, maximum.

- B. Glass Guards:
 - 1. Glass: Tempered laminated float glass, clear. 1/2" glass.
 - 2. Basis of Design: Viva Railings Modular Railing Systems - Viva Shoe System
 - a. Top Rail:
 - 1) Material and Finish: Stainless Steel Channel, #4 Brushed
 - 2) Size: Minimum 1-1/2" depth with width sufficient to receive 1/2" glass infill.
 - b. Infill at Pipe Railings: Pipe or tube rails sloped parallel to stair.
 - c. Bottom Rail (Shoe):
 - 1) Material and Finish: Aluminum SHOE clad with stainless steel, #4 Brushed
 - 2) Size: 2.5" x 4"
 - d. Mounting:
 - 1) Top Mount unless noted otherwise.
- C. Handrails:
 - 1. Stainless Steel Tube; 1-1/4 inch, minimum, to 1-1/2 inches, maximum.
- D. Approved Manufacturers
 - 1. Viva Railings Modular Railing Systems
 - 2. CRL (C.R. Laurence Co. Inc.)
 - 3. Q-Railings www.q-railing.com
 - 4. Substitutions: See Section 01 6000 - Product Requirements.

2.04 MATERIALS

- A. Steel Sections: ASTM A36/A36M.
- B. Steel Tubing: ASTM A500/A500M or ASTM A501/A501M structural tubing, round and shapes as indicated.
- C. Pipe: ASTM A53/A53M Grade B Schedule 40, black finish.
- D. Stainless Steel Tubing: ASTM A555, 304 where welded stainless steel, ornamental tubing with a #4 brushed finish.
- E. Ungalvanized Steel Sheet: Hot- or cold-rolled, except use cold-rolled where finished work will be exposed to view.
 - 1. Hot-Rolled Steel Sheet: ASTM A1011/A1011M, Designation CS (commercial steel).
 - 2. Cold-Rolled Steel Sheet: ASTM A1008/A1008M, Designation CS (commercial steel).
- F. Concrete Fill: Portland cement Type I, 3000 psi 28 day strength, 2 to 3 inch slump.
- G. Glazing: Tempered laminated float glass, clear.

2.05 ACCESSORIES

- A. Steel Bolts, Nuts, and Washers: ASTM F3125/F3125M, Type 1, and galvanized to ASTM A153/A153M where connecting galvanized components.
- B. Welding Materials: AWS D1.1/D1.1M; type required for materials being welded.
- C. Shop and Touch-Up Primer: SSPC-Paint 15, and comply with VOC limitations of authorities having jurisdiction.

2.06 SHOP FINISHING

- A. Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.
- B. Do not prime surfaces in direct contact with concrete or where field welding is required.
- C. Prime Painting: Use specified shop- and touch-up primer.
 - 1. Preparation of Steel: In accordance with SSPC-SP 2 Hand Tool Cleaning.
 - 2. Number of Coats: One. Apply two coats to surfaces which are inaccessible after assembly or erection.

PART 3 EXECUTION

3.01 EXAMINATION

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

3.02 PREPARATION

- A. When field welding is required, clean and strip primed steel items to bare metal.
- B. Supply items required to be cast into concrete and embedded in masonry with setting templates.

3.03 INSTALLATION

- A. Install components plumb and level, accurately fitted, free from distortion or defects.
- B. Provide anchors, plates, angles, hangers, and struts required for connecting stairs to structure.
- C. Allow for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.
- D. Provide welded field joints where specifically indicated on drawings. Perform field welding in accordance with AWS D1.1/D1.1M.
- E. Other field joints may be either welded or bolted provided the result complies with the limitations specified for jointing quality levels.
- F. Obtain approval prior to site cutting or creating adjustments not scheduled.
- G. After erection, prime welds, abrasions, and surfaces not shop primed or galvanized, except surfaces to be in contact with concrete.

3.04 TOLERANCES

- A. Maximum Variation From Plumb: 1/4 inch per story, non-cumulative.
- B. Maximum Offset From True Alignment: 1/4 inch.

3.05 SCHEDULES

- A. Stainless steel handrails at the follow locations:
 - 1. Stair A117
 - 2. Collaboration Seating & Stairs B122
 - 3. Stair C119
 - 4. Platform D104 at the stairs and ramp
 - 5. Orchestra D133 stairs to platform
 - 6. Stair E118
 - 7. Stair E202
 - 8. Stair F104

END OF SECTION 05 5100

**SECTION 05 5133
METAL LADDERS**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Shop-fabricated metal ladders.
- B. Prefabricated ladders.

1.02 RELATED REQUIREMENTS

1.03 REFERENCE STANDARDS

- A. ANSI A14.3 - American National Standard for Ladders -- Fixed -- Safety Requirements; 2008 (Reaffirmed 2018).
- B. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2019.
- C. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless; 2022.
- D. ASTM A307 - Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength; 2021.
- E. ASTM A501/A501M - Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing; 2021.
- F. ASTM B26/B26M - Standard Specification for Aluminum-Alloy Sand Castings; 2018, with Editorial Revision.
- G. ASTM B85/B85M - Standard Specification for Aluminum-Alloy Die Castings; 2018, with Editorial Revision.
- H. ASTM B209/B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2021a.
- I. ASTM B210/B210M - Standard Specification for Aluminum and Aluminum-Alloy Drawn Seamless Tubes; 2019a.
- J. ASTM B211/B211M - Standard Specification for Aluminum and Aluminum-Alloy Rolled or Cold Finished Bar, Rod, and Wire; 2019.
- K. 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; 2023.
- L. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination; 2020.
- 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 (2023).
- O. AWS D1.2/D1.2M - Structural Welding Code - Aluminum; 2014, with Errata (2020).
- P. IAS AC172 - Accreditation Criteria for Fabricator Inspection Programs for Structural Steel AC172; 2019.
- Q. SSPC-Paint 15 - Steel Joist Shop Primer/Metal Building Primer; 2004.
- R. SSPC-SP 2 - Hand Tool Cleaning; 2018.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings:
 - 1. Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories. Include erection drawings, elevations, and details where applicable.
 - 2. Indicate welded connections using standard AWS A2.4 welding symbols. Indicate net weld lengths.

- 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. Fabricator's Qualification Statement: Provide documentation showing steel fabricator is accredited under IAS AC172.

PART 2 PRODUCTS

2.01 MATERIALS - STEEL

- A. Steel Sections: ASTM A36/A36M.
- B. Steel Tubing: ASTM A501/A501M hot-formed structural tubing.
- C. Pipe: ASTM A53/A53M, Grade B Schedule 40, black finish.
- D. Bolts, Nuts, and Washers: ASTM A307, plain.
- E. Bolts, Nuts, and Washers: ASTM F3125/F3125M, Type 1, plain.
- F. Welding Materials: AWS D1.1/D1.1M; type required for materials being welded.
- G. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.

2.02 MATERIALS - ALUMINUM

- A. Extruded Aluminum: ASTM B211/B211M, 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. Bolts, Nuts, and Washers: Stainless steel.
- H. 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. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.
- D. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.

2.04 FABRICATED LADDERS

- A. Ladders: Steel; in compliance with ANSI A14.3; with mounting brackets and attachments; prime paint finish.
 - 1. Side Rails: 3/8 by 2 inches members spaced at 20 inches.
 - 2. Rungs: One inch diameter solid round bar spaced 12 inches on center.
 - 3. Space rungs 7 inches from wall surface.

2.05 PREFABRICATED LADDERS

- A. Prefabricated Ladder: Welded metal unit complying with ANSI A14.3; factory fabricated to greatest degree practical and in the largest components possible.
 - 1. Components: Manufacturer's standard rails, rungs, treads, handrails. returns, platforms and safety devices complying with the requirements of the MATERIALS article of this section.
 - a. Provide safety cage on any ladders where code requirements dictate due to overall height between levels (greater than 24 feet).
 - b. Security gate/door:

- 1) Location: Stage, Mechanical Yard
2. Materials: Aluminum; ASTM B211/B211M 6063 alloy, T52 temper.
3. Finish: Mill finish aluminum.
4. Manufacturers:
 - a. Industrial Ladder & Scaffolding, Inc.; _____: www.anyladder.com/#sle.
 - b. O'Keeffe's Inc; Model 500: www.okeeffes.com/#sle.
 - c. Precision Ladders, LLC; Heavy Duty Aluminum Fixed Ladders: www.precisionladders.com/#sle.
 - d. Substitutions: See Section 01 6000 - Product Requirements.

2.06 FINISHES - STEEL

- A. Prime paint steel items.
 1. Do not prime surfaces in direct contact with concrete.
 2. Do not prime surfaces where field welding is required.
- B. Prepare surfaces to be primed in accordance with SSPC-SP2.
- C. Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.
- D. Prime Painting: One coat.

2.07 FABRICATION TOLERANCES

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

PART 3 EXECUTION

3.01 EXAMINATION

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

3.02 PREPARATION

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

3.03 INSTALLATION

- A. Install items plumb and level, accurately fitted, free from distortion or defects.
- B. Provide for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.
- C. Obtain approval prior to site cutting or making adjustments not scheduled.

END OF SECTION 05 5133

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**SECTION 06 1000
ROUGH CARPENTRY**

PART 1 GENERAL

1.01 SECTION INCLUDES (SEE STRUCTURAL SHEET NOTES)

- A. Nonstructural dimension lumber framing.
- B. Rough opening framing for doors, windows, and roof openings.
- C. Sheathing.
- D. Roof-mounted curbs.
- E. Roofing nailers.
- F. Preservative treated wood materials.
- G. Fire retardant treated wood materials.
- H. Miscellaneous framing and sheathing.
- I. Communications and electrical room mounting boards.
- J. Concealed wood blocking, nailers, and supports.
- K. Miscellaneous wood nailers, furring, and grounds.

1.02 RELATED REQUIREMENTS

- A. Section 05 1200 - Structural Steel Framing: Prefabricated beams and columns for support of wood framing.
- B. Section 05 5000 - Metal Fabrications: Miscellaneous steel connectors and support angles for wood framing.
- C. Section 07 6200 - Sheet Metal Flashing and Trim:

1.03 REFERENCE STANDARDS

- A. AWC (WFCM) - Wood Frame Construction Manual for One- and Two-Family Dwellings; 2018, with Errata (2019).
- B. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2023.
- C. ASTM D2898 - Standard Practice for Accelerated Weathering of Fire-Retardant-Treated Wood for Fire Testing; 2010 (Reapproved 2017).
- D. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2023d.
- E. AWPA U1 - Use Category System: User Specification for Treated Wood; 2023.
- F. PS 1 - Structural Plywood; 2023.
- 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 technical data on wood preservative materials.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. General: Cover wood products to protect against moisture. Support stacked products to prevent deformation and to allow air circulation.
- B. Fire Retardant Treated Wood: Prevent exposure to precipitation during shipping, storage, and installation.

1.06 WARRANTY

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

PART 2 PRODUCTS

2.01 GENERAL REQUIREMENTS

- A. Dimension Lumber: Comply with PS 20 and requirements of specified grading agencies.
 - 1. Species: Douglas Fir, unless otherwise indicated. See structural dwgs
 - 2. Grading Agency: 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 DIMENSION LUMBER FOR CONCEALED APPLICATIONS

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

2.03 CONSTRUCTION PANELS

- A. Communications and Electrical Room Mounting Boards: PS 1 A-D plywood, or medium density fiberboard; 3/4 inch thick; flame spread index of 25 or less, smoke developed index of 450 or less, when tested in accordance with ASTM E84.

2.04 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.

2.05 FACTORY WOOD TREATMENT

- A. Treated Lumber and Plywood: Comply with requirements of AWWA U1 - Use Category System for wood treatments determined by use categories, expected service conditions, and specific applications.
 - 1. Fire-Retardant Treated Wood: Mark each piece of wood with producer's stamp indicating compliance with specified requirements.
 - 2. Preservative-Treated Wood: Provide lumber and plywood marked or stamped by an ALSC-accredited testing agency, certifying level and type of treatment in accordance with AWWA standards.
- B. Fire Retardant Treatment:
 - 1. Exterior Type: AWWA 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.
 - 2. Interior Type A: AWWA U1, Use Category UCFA, Commodity Specification H, low temperature (low hygroscopic) type, chemically treated and pressure impregnated; capable of providing a maximum flame spread 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.

C. Preservative Treatment:

1. Preservative Pressure Treatment of Lumber Above Grade: AWPA U1, Use Category UC3B, Commodity Specification A using waterborne preservative.
 - a. Kiln dry lumber after treatment to maximum moisture content of 19 percent.
 - b. Treat lumber exposed to weather.
 - c. Treat lumber in contact with roofing, flashing, or waterproofing.
 - d. Treat lumber in contact with masonry or concrete.
 - e. Treat lumber less than 18 inches above grade.
 - f. Treat lumber in other locations as indicated.
2. Preservative Pressure Treatment of Plywood Above Grade: AWPA U1, Use Category UC2 and UC3B, Commodity Specification F using waterborne preservative.
 - a. Kiln dry plywood after treatment to maximum moisture content of 19 percent.
 - b. Treat plywood in contact with roofing, flashing, or waterproofing.
 - c. Treat plywood in contact with masonry or concrete.
 - d. Treat plywood less than 18 inches above grade.
 - e. Treat plywood in other locations as indicated.

PART 3 EXECUTION

3.01 PREPARATION

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

3.02 INSTALLATION - GENERAL

- A. Select material sizes to minimize waste.
- B. Reuse scrap to the greatest extent possible; clearly separate scrap for use on site as accessory components, including: shims, bracing, and blocking.

3.03 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 and AWC (WFCM) Wood Frame Construction Manual.
- E. Install horizontal spanning members with crown edge up and not less than 1-1/2 inches of bearing at each end.
- F. Frame wall openings with two or more studs at each jamb; support headers on cripple studs.

3.04 BLOCKING, NAILERS, AND SUPPORTS

- A. Provide framing and blocking members as indicated or as required to support finishes, fixtures, specialty items, and trim.
- B. In walls, provide blocking attached to studs as backing and support for wall-mounted items, unless item can be securely fastened to two or more studs or other method of support is

explicitly indicated.

- C. Where ceiling-mounting is indicated, provide blocking and supplementary supports above ceiling, unless other method of support is explicitly indicated.
- D. Provide the following specific nonstructural framing and blocking:
 - 1. Cabinets and shelf supports.
 - 2. Wall brackets.
 - 3. Handrails.
 - 4. Grab bars.
 - 5. Towel and bath accessories.
 - 6. Wall-mounted door stops.
 - 7. Wall mounted medical equipment or other as directed by owner
 - 8. Art work as directed by owner
 - 9. Chalkboards and marker boards.
 - 10. Wall paneling and trim.
 - 11. Joints of rigid wall coverings that occur between studs.

3.05 ROOF-RELATED CARPENTRY

- A. Coordinate installation of roofing carpentry with deck construction, framing of roof openings, and roofing assembly installation.
- B. Provide wood curb at each roof opening except where prefabricated curbs are specified and where specifically indicated otherwise; form corners by alternating lapping side members.

3.06 INSTALLATION OF CONSTRUCTION PANELS

- A. Wall Sheathing: Secure with long dimension perpendicular to wall studs, with ends over firm bearing and staggered, using nails, screws, or staples.
- B. Communications and Electrical Room Mounting Boards: Secure with screws to studs with edges over firm bearing; space fasteners at maximum 24 inches on center on all edges and into studs in field of board.
 - 1. At fire-rated walls, install board over wall board indicated as part of the fire-rated assembly.
 - 2. Where boards are indicated as full floor-to-ceiling height, install with long edge of board parallel to studs.
 - 3. Install adjacent boards without gaps.
 - 4. Size and Location: As indicated on drawings.

3.07 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.

3.08 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 2000
FINISH CARPENTRY**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Finish carpentry items.
- B. Solid surface interior window stools (sills).

1.02 RELATED REQUIREMENTS

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

1.03 REFERENCE STANDARDS

- A. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards, 2nd Edition; 2014, with Errata (2016).
- B. AWMAC/WI (NAAWS) - North American Architectural Woodwork Standards; 2021, with Errata.
- C. NEMA LD 3 - High-Pressure Decorative Laminates; 2005.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Shop Drawings: Indicate materials, component profiles, fastening methods, jointing details, and accessories.
 - 1. Provide information as required by AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS).
 - 2. Include certification program label.
- C. Samples: Submit two samples solid surface.

1.05 QUALITY ASSURANCE

- A. Fabricator Qualifications: Company specializing in fabricating the products specified in this section with minimum five years of documented experience.
 - 1. Accredited participant in the specified certification program prior to the commencement of fabrication and throughout the duration of the project.
- B. Quality Certification:
 - 1. Provide labels or certificates indicating that work complies with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS) requirements for grade or grades specified.
 - 2. Provide designated labels on shop drawings as required by certification program.
 - 3. Provide designated labels on installed products as required by certification program.
 - 4. Submit certifications upon completion of installation that verifies this work is in compliance with specified requirements.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Protect from moisture damage.

PART 2 PRODUCTS

2.01 FINISH CARPENTRY ITEMS

- A. Quality Standard: Custom Grade, in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), unless noted otherwise.
- B. Interior Woodwork Items:
 - 1. Window Sills: Solid Surface.

2.02 LUMBER MATERIALS

2.03 PLASTIC LAMINATE MATERIALS

- A. Plastic Laminate: NEMA LD 3, HGS; color as selected by Architect; finish as selected.
- B. Solid e: 1/2" thk window sills with eased edges equivalent to Willsonart-Gibraltar, Dupont-Corlan, or equivalent. Color as selected by architect from manufacturers standard. color, and surface texture as selected.

- C. Laminate Adhesive: Type recommended by laminate manufacturer to suit application; not containing formaldehyde or other volatile organic compounds.

2.04 FASTENINGS

- A. Adhesive for Purposes Other Than Laminate Installation: Suitable for the purpose; not containing formaldehyde or other volatile organic compounds.
- B. Fasteners: Of size and type to suit application. None - N/A None - N/A

2.05 ACCESSORIES

- A. Primer: Alkyd primer sealer.
- B. Wood Filler: Solvent base, tinted to match surface finish color.

2.06 FABRICATION

- A. Shop assemble work for delivery to site, permitting passage through building openings.
- B. Cap exposed plastic laminate finish edges with material of same finish and pattern.
- C. When necessary to cut and fit on site, provide materials with ample allowance for cutting. Provide trim for scribing and site cutting.

2.07 SHOP FINISHING

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

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify adequacy of backing and support framing.

3.02 INSTALLATION

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

3.03 PREPARATION FOR SITE FINISHING

- A. Set exposed fasteners. Apply wood filler in exposed fastener indentations. Sand work smooth.
- B. Before installation, prime paint surfaces of items or assemblies to be in contact with cementitious materials.

3.04 TOLERANCES

- A. Maximum Variation from True Position: 1/16 inch.
- B. Maximum Offset from True Alignment with Abutting Materials: 1/32 inch.

END OF SECTION 06 2000

**SECTION 06 4100
ARCHITECTURAL WOOD CASEWORK**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Specially fabricated cabinet units.
- B. Countertops.
- C. Galvanized steel countertops.
- D. Solid surface window sills.
- E. Metal knee brace.
- F. Hardware.
- G. Factory finishing.
- H. Preparation for installing utilities.

1.02 RELATED REQUIREMENTS

- A. Section 05 5000 - Metal Fabrications
- B. Section 06 1000 - Rough Carpentry: Support framing, grounds, and concealed blocking.

1.03 REFERENCE STANDARDS

- A. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards, 2nd Edition; 2014, with Errata (2016).
- B. AWMAC/WI (NAAWS) - North American Architectural Woodwork Standards; 2021, with Errata.
- C. BHMA A156.9 - Cabinet Hardware; 2020.
- D. NEMA LD 3 - High-Pressure Decorative Laminates; 2005.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Shop Drawings: Indicate materials, component profiles, fastening methods, jointing details, and accessories.
- C. Product Data: Provide data for hardware accessories.
- D. Samples: Submit actual sample items of all proposed hardware including pulls and hinges, demonstrating hardware design, quality, and finish. Submit samples of all millwork finishes.

1.05 QUALITY ASSURANCE

- A. Fabricator Qualifications: Company specializing in fabricating the products specified in this section with minimum five years of documented experience.

1.06 MOCK-UPS

- A. Provide mock-up of typical base cabinet, wall cabinet, and countertop, including hardware and finishes.
- B. See Section 01 4000 - Quality Requirements for additional requirements.
- C. Locate where directed.
- D. Mock-up may remain as part of the work.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Protect units from moisture damage.

1.08 FIELD CONDITIONS

- A. During and after installation of custom cabinets, maintain temperature and humidity conditions in building spaces at same levels planned for occupancy.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Substitutions: See Section 01 6000 - Product Requirements.
- B. Single Source Responsibility: Provide and install this work from single fabricator.

2.02 CABINETS

- A. Quality Standard: Custom Grade, in accordance with AWI/AWMAC/WI (AWS), unless noted otherwise.
- B. Plastic Laminate Faced Cabinets: Custom grade.
- C. Breakroom Cabinets: Plastic laminate faced, Custom grade.
- D. Cabinets:
 - 1. Finish - Exposed Exterior Surfaces: Decorative laminate. Where indicated on drawings.
 - 2. Finish - Exposed Interior Surfaces: Decorative laminate where indicated on drawings.
 - 3. Finish - Semi-Exposed Surfaces: Decorative laminate
 - 4. Finish - Concealed Surfaces: Melamine.
 - 5. Door and Drawer Front Edge Profiles: Square edge.
 - 6. Casework Construction Type: Type A - Frameless - Flush Overlay.
 - 7. Grained Face Layout for Cabinet and Door Fronts: Flush panel.
 - a. Custom Grade: Doors, drawer fronts and false fronts wood grain to run and match vertically within each cabinet unit.
 - 8. Adjustable Shelf Loading: 40 psf.
 - 9. Cabinet Style: Flush overlay.
 - 10. Drawer Side Construction: Multiple-dovetailed.
 - 11. Drawer Construction Technique: Dovetail joints.
 - 12. Shelves to be 1" min thickness typical including upper cabinet bottoms.
 - 13. Drawer Box Material: Baltic Birch.

2.03 LAMINATE MATERIALS

- A. Manufacturers:
 - 1. Formica Corporation; None - N/A: www.formica.com/#sle.
 - 2. Panolam Industries International, Inc; Nevamar; None - N/A: www.nevamar.com/#sle.
 - 3. Wilsonart LLC; None - N/A: www.wilsonart.com/#sle.
 - 4. Substitutions: See Section 01 6000 - Product Requirements.
- B. High Pressure Decorative Laminate (HPDL): NEMA LD 3, types as recommended for specific applications.
- C. Provide specific types as indicated.
 - 1. Horizontal Surfaces for counter tops: HGS, 0.048 inch nominal thickness, through color, see plans for
 - 2. Vertical Surfaces: VGS, 0.028 inch nominal thickness, through color, see plans for color and finish.
 - 3. Post-Formed Horizontal Surfaces: HGP, 0.039 inch nominal thickness.
 - 4. Cabinet Liner: CLS, 0.020 inch nominal thickness.
 - 5. Colors: Up to seven (7) colors of plastic laminate may be selected by Architect from Manufacturer's standard and premium colors.

2.04 COUNTERTOPS

- A. Plastic Laminate Countertops: Medium density fiberboard substrate covered with HPDL, conventionally fabricated and self-edge banded. and 1-1/2" 3mm pvc edge color as selected by architect
- B. Solid Surface countertops: Basis of Design: Wilsonart - Thinscape, Silestone - Quartz .
 - 1. Quality standard: Comply with AWS Section 11 requirements for solid surface countertops
 - 2. Grade: Custom
 - 3. 3/4" min thickness with 1-1/2" squared edges.

4. Color as selected in plans
- C. Ultra Compact Surfacing Countertops: Basis of Design :Cosentino - Dekton - Doomos
 1. Quality standard: Comply with AWS Section 11 requirements for solid surface countertops
 2. 1.2 cm thickness with 1-1/2" squared edges.
 3. Color as indicated in plans.

2.05 MUSICAL INSTRUMENT STORAGE SPECIAL UNITS.

- A. Basis of Design Manufacturer: Wenger Corporation; UltraStor Storage Cabinets with adjustable shelving: www.wengercorp.com.
- B. Alternate: Instrument storage units may be constructed from the cabinet section as listed above matching items as specified below.
- C. Style: Flush Inset, Type A. Ease doors and drawer fronts slightly at edges.
- D. Primary Construction: Thermally fused laminate units.
 1. Design: Modular units with through-bolted fastening for reconfigurable assembly.
 2. Cabinet Hardware: Manufacturer's standard, types as required for drawers, doors, shelves, levelers and similar items.
 - a. Doors: Grilled
 - b. Shelving: Adjustable
 - c. Ventilation: Provide thru ventilation
 - d. Hinges: Butt.
 3. Finish, Surface Color and Pattern: As selected by Architect from manufacturer's full line.
 4. Layout: As indicated on the drawings

2.06 ACCESSORIES

- A. Adhesive: Type recommended by fabricator to suit application.
- B. Plastic Edge Banding: Extruded PVC, 3mm smooth finish;
 1. Color: As selected by Architect from manufacturer's full range. Match laminate materials noted in the notes section of the millwork groupings.
 2. Color: As indicated on drawings.
 3. Use at all exposed shelf edges.
 4. Provide to the owner 10% extra stock for each color of edge banding used on the project.
- C. Mirrors: Glass mirrors as shown attached to cabinets are work of this section.
- D. Fasteners: Size and type to suit application.
- E. Bolts, Nuts, Washers, Lags, Pins, and Screws: Of size and type to suit application; galvanized or chrome-plated finish in concealed locations and stainless steel or chrome-plated finish in exposed locations.
- F. Grommets: Standard plastic grommets for cut-outs, in color as selected by architect.
 1. Provide 5 per work station at reception desks and countertops with knee space below. Locate per owner requirements.
- G. Knee braces: as provided by Section 05 5000

2.07 HARDWARE

- A. Hardware: BHMA A156.9, types as indicated for quality grade specified.
- B. Adjustable Shelf Supports: Standard side-mounted system using multiple holes for pin supports 32 mm @ 1 inch centers.
 1. Product: 345 NP manufactured by K&V.
- C. Drawer and Door Pulls: back mounted.
- D. Cabinet Locks: Manufacturer's standard ANSI/BHMA, Grade 1, (5) pin-tumbler deadbolt type locks. All cabinet doors and drawers shall be locked unless noted otherwise on drawings.
 1. Small pin-tumbler or interchangeable core deadbolt style with heavy duty deadbolt.
 - a. Disc-tumbler type locks will not be not accepted.
 - b. Cam locks will not be not accepted.

2. Base Products:
 - a. Door locks ANSI number E07121.
 - 1) Product Standard: Olympus 100DR.
 - b. Door locks ANSI number E07041.
 - 1) Product Standard: Olympus 200DW.
3. Finish: Satin Chrome.
4. Keying: Coordinated keying with the District.
 - a. Direct any questions to: Travis Lindsley, phone: (385) 309-7843, email: trlindsey@wsd.net
 - b. Key locks within each room alike - Refer to Key Schedule.
 - c. Key rooms differently from each other.
 - d. Master key all locks, furnish (6) mater keys to owner.
 - e. Master key system must accommodate a minimum of 2,000 key changes.
- E. Catches: Magnetic.
- F. Slide bolt latch at double doors.
- G. Drawer Slides:
 1. Type: Full extension.
 2. Static Load Capacity: Pencil drawers 45 lbf, Box drawers 100 lbf and, File drawers 200 lbf.
 3. Mounting: Side mounted.
 4. Stops: Integral type.
- H. Hinges: European style concealed self-closing type, 170 degree snap on type, steel with satin finish.
- I. File Drawer Inserts: provide bar type file drawer inserts to accomodate "letter" and "legal" size hanging files.
- J. Closet rods K&V-880
- K. Coat hooks equivalent to EPCO CH201-ZC.

2.08 SHOP TREATMENT OF WOOD MATERIALS

2.09 FABRICATION

- A. Assembly: Shop assemble cabinets for delivery to site in units easily handled and to permit passage through building openings.
- B. Matching Wood Grain: Comply with requirements of quality standard for specified Grade. "None - N/A"
- C. Provide cutouts for plumbing fixtures. Verify locations of cutouts from on-site dimensions. Prime paint cut edges.

2.10 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:

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify adequacy of backing and support framing.
- B. Verify location and sizes of utility rough-in associated with work of this section.

3.02 INSTALLATION

- A. Install work in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS) requirements for grade indicated.
- B. Set and secure custom cabinets in place, assuring that they are rigid, plumb, and level.
- C. Carefully scribe casework abutting other components, with maximum gaps of 1/32 inch. Do not use additional overlay trim for this purpose. Provide continous sealant a butting adjacent surfaces. color as selected by architect.

- D. Secure cabinets to floor using appropriate angles and anchorages.
- E. Countersink anchorage devices at exposed locations. Conceal with solid wood plugs of species to match surrounding wood; finish flush with surrounding surfaces.

3.03 ADJUSTING

- A. Test installed work for rigidity and ability to support loads. Adjust as required.
- B. Adjust moving or operating parts to function smoothly and correctly.

3.04 CLEANING

- A. Clean casework, counters, shelves, hardware, fittings, and fixtures.

END OF SECTION 06 4100

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**SECTION 07 1113
BITUMINOUS DAMPPROOFING**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Bituminous dampproofing.
- B. Protection boards.

1.02 RELATED REQUIREMENTS

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

1.03 REFERENCE STANDARDS

- A. ASTM D41/D41M - Standard Specification for Asphalt Primer Used in Roofing, Dampproofing, and Waterproofing; 2011 (Reapproved 2023).
- B. ASTM D1227/D1227M - Standard Specification for Emulsified Asphalt Used as a Protective Coating for Roofing; 2013, with Editorial Revision (2019).
- C. ASTM D4479/D4479M - Standard Specification for Asphalt Roof Coatings - Asbestos-Free; 2007 (Reapproved 2018).
- D. NRCA (WM) - The NRCA Waterproofing Manual; 2021.

1.04 SUBMITTALS

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

1.05 QUALITY ASSURANCE

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

1.06 FIELD CONDITIONS

- A. Maintain ambient temperatures above 40 degrees F for 24 hours before and during application until dampproofing has cured.

PART 2 PRODUCTS

2.01 BITUMINOUS DAMPPROOFING

- A. Bituminous Dampproofing: Cold-applied, spray-grade; asphalt base, volatile petroleum solvents, and other content, suitable for application by spray, brush, roller, or squeegee; asbestos-free; suitable for application on vertical and horizontal surfaces.
 - 1. Composition: ASTM D4479/D4479M Type II, minimum, asbestos free.
 - 2. VOC Content: Not more than permitted by local, State, and federal regulations.
 - 3. Applied Thickness: 1/16 inch, minimum, wet film.
 - 4. Products:
 - a. W. R. Meadows, Inc; Sealmastic Spray-Mastic: www.wrmeadows.com/#sle.
 - b. KARNAK Corp. 83 Fibered: www.karnakcorp.com
 - c. Substitutions: See Section 01 6000 - Product Requirements.
- B. Primers, Mastics, and Related Materials: Type as recommended by dampproofing manufacturer.

2.02 BITUMEN MATERIALS

- A. Cold Asphaltic Type:
 - 1. Emulsified Asphalt: ASTM D1227/D1227M, with fiber reinforcement other than asbestos, Type II, Class 1 or 2.
 - 2. Asphalt Primer: ASTM D41/D41M, compatible with substrate.

2.03 ACCESSORIES

- A. Protection Board: Rigid insulation; see Section 07 2100.

PART 3 EXECUTION

3.01 EXAMINATION

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

3.02 PREPARATION

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

3.03 APPLICATION

- A. Foundation Walls: Apply two coats of asphalt dampproofing.
- B. Foundation Walls: Patch disturbed areas of existing dampproofing with two additional coats of dampproofing of the same generic type.
- C. Perform this work in accordance with manufacturer's instructions and NRCA (WM) applicable requirements.
- D. Prime surfaces in accordance with manufacturer's instructions and NRCA (WM) applicable requirements.
- E. Apply bitumen by spray application.
- F. Apply bitumen in one coat, continuous and uniform, at a rate of 25 sq ft/gal per coat.
- G. Apply from 2 inches below finish grade elevation down to toe of footings.
- H. Seal items watertight with mastic, that project through dampproofing surface.
- I. Place protection board directly over dampproofing, butt joints, and adhere to tacky dampproofing.
- J. Scribe and cut boards around projections, penetrations, and interruptions.

END OF SECTION 07 1113

**SECTION 07 1300
UNDER-SLAB VAPOR BARRIER**

PART 1 – GENERAL

1.01 SUMMARY

- A. Products supplied under this section:
 - 1. Vapor barrier and installation accessories for installation under concrete slabs.
- B. Related sections:
 - 1. Section 03 30 00 Cast-in-Place Concrete
 - 2. Section 07 26 00 Vapor Retarders

REFERENCES

- A. American Society for Testing and Materials (ASTM):
 - 1. ASTM E1745- 11Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill Under Concrete Slabs.
 - 2. ASTM E1643- 11Selection, 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.

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 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.
 - 5. Contact vapor barrier manufacturer to schedule a pre-construction meeting and to coordinate a review, in-person or digital, of the vapor barrier installation.
 - 6. Vapor barrier manufacturer must warrant in writing (a) compliance with the designated ASTM E1745 classification, and (b) no manufacturing defects in the product for, at least, the Life of the Building.
 - 7. Manufacturer verify in writing 20 years in the industry with no reported product failures.

PART 2 – PRODUCTS

4.01 MATERIALS

4.02 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
- B. Vapor barrier products:
 - 1. Basis of Design: Stego Wrap Vapor Barrier (15-mil) by Stego Industries LLC., (877) 464-7834 www.stegoindustries.com.
 - 2. No substitutions.

ACCESSORIES

- A. Seams:

STEGO TAPE BY STEGO INDUSTRIES LLC, (877) 464-7834 WWW.STEGOINDUSTRIES.COM.

- A. Sealing Penetrations of Vapor barrier:

STEGO MASTIC BY STEGO INDUSTRIES LLC, (877) 464-7834 WWW.STEGOINDUSTRIES.COM.

STEGO TAPE BY STEGO INDUSTRIES LLC, (877) 464-7834 WWW.STEGOINDUSTRIES.COM.

- A. Stego Crete Claw by Stego Industries LLC, (877) 464-7834 www.stegoindustries.com.

STEGO TERM BAR BY STEGO INDUSTRIES LLC, (877) 464-7834 WWW.STEGOINDUSTRIES.COM.

1. StegoTack Tape (double-sided sealant tape) by Stego Industries LLC, (877) 464-7834 www.stegoindustries.com.
- B. Penetration Prevention:
 1. Beast Foot by Stego Industries LLC, (877) 464-7834 www.stegoindustries.com.
 2. Beast Form Stake by Stego Industries LLC, (877) 464-7834 www.stegoindustries.com
- C. Vapor Barrier-Safe Screed System
 1. Beast Screed by Stego Industries, LLC, (877) 464-7834 www.stegoindustries.com.

PART 3 – EXECUTION

10.01 PREPARATION

- A. Ensure that subsoil is approved by Architect or Geotechnical Engineer.
1. Level and compact base material.

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.
 3. [Specifier note: The perimeter seal can be handled several ways. When sealing to the slab,
 4. Crete Claw is the best option. When sealing to a stem wall or wall,
 5. the best option is to use StegoTack Tape or both StegoTack Tape and Stego Term Bar.]
 - a. OR
 - b. Seal vapor barrier to the entire perimeter wall or footing/grade beam with double sided StegoTack Tape, or both Stego Term Bar and StegoTack Tape, per manufacturer's instructions. Ensure the concrete is clean and dry prior to adhering tape.
 6. Overlap joints 6 inches and seal with manufacturer's seam tape.
 7. Apply seam tape/Crete Claw to a clean and dry vapor barrier.
 8. Seal all penetrations (including pipes) per manufacturer's instructions.
 9. For interior forming applications, avoid the use of non-permanent stakes driven through vapor barrier. Use Beast Form Stake and Beast Foot as a vapor barrier-safe forming system. Ensure Beast Foot's peel-and-stick adhesive base is fully adhered to the vapor barrier.
 10. 7. If non-permanent stakes must be driven through vapor retarder, repair as recommended by vapor retarder manufacturer.
 11. Use reinforcing bar supports with base sections that eliminate or minimize the potential for puncture of the vapor barrier.
 12. Repair damaged areas with vapor barrier material of similar (or better) permeance, puncture and tensile.

13. For vapor barrier-safe concrete screeding applications, install Beast Screed (vapor barrier-safe screed system) per manufacturer's instructions prior to placing concrete.

END OF SECTION 07 1300

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**SECTION 07 1900
WATER REPELLENTS**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Water repellents applied to exterior and interior, masonry surfaces.
- B. Pressure washing.

1.02 RELATED REQUIREMENTS

- A. Section 01 6116 - Volatile Organic Compound (VOC) Content Restrictions.

1.03 REFERENCE STANDARDS

- A. ASTM C140/C140M - Standard Test Methods for Sampling and Testing Concrete Masonry Units and Related Units; 2023a.
- B. ASTM C642 - Standard Test Method for Density, Absorption, and Voids in Hardened Concrete; 2021.

1.04 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: 5 gallons of type installed.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years documented experience.
- B. Installer Qualifications: Company specializing in performing work of type specified and with at least three years of documented experience
- C. Owner reserves the right to provide continuous independent inspection of surface preparation and application of water repellent.

1.06 MOCK-UPS

- A. Prepare a representative surface 48 inch by 48 inch in size using specified materials and preparation and application methods on surfaces identical to those to be coated; approved mock-up constitutes standard for workmanship.
- B. Mock-up may remain as part of work.

1.07 FIELD CONDITIONS

- A. Protect liquid materials from freezing.
- B. Do not apply water repellent when ambient temperature is lower than 50 degrees F or higher than 90 degrees F.

1.08 WARRANTY

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

- C. Provide five year manufacturer warranty for water repellent.
 - 1. Include coverage for degradation of waterproofing ability and reduction in graffiti resistance on designated substrate.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Silane, Siloxane, Silane-Siloxane Blend, and Siliconate Water Repellents and Graffiti Control:
 - 1. PROSOCO, Inc; Sure Klean® Weather Seal Blok-Guard® & Graffiti Control :
www.prosoco.com/#sle.
 - 2. Substitutions: See Section 01 6000 - Product Requirements.

2.02 MATERIALS

- A. Water Repellent: Non-glossy, colorless, penetrating, water-vapor-permeable, non-yellowing sealer, that dries invisibly leaving appearance of substrate unchanged.
 - 1. Applications: Vertical surfaces and non-traffic horizontal surfaces.
 - 2. Number of Coats: Two.
 - 3. VOC Content: See Section 01 6116.
 - 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. Moisture Absorption When Applied to Concrete: Five percent, maximum, when tested in accordance with ASTM C642 concrete sample completely coated with water repellent.
 - 6. Maintains dry appearance when wetted.

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 water repellent.
- B. Prepare surfaces to be coated as recommended by water repellent manufacturer for best results.
- C. Do not start work until masonry mortar substrate is cured a minimum of 60 days.
- D. Remove oil and foreign substances with a chemical solvent that will not affect water repellent.
- E. Pressure wash surfaces to be coated.
- F. Allow surfaces to dry completely to degree recommended by water repellent manufacturer before starting coating work.

3.03 APPLICATION

- A. Apply water repellent in accordance with manufacturer's instructions, using procedures and application methods recommended as producing the best results.
- B. Apply at rate recommended by manufacturer, continuously over entire surface.
- C. Apply two coats, minimum.
- D. Remove water repellent from unintended surfaces immediately by a method instructed by water repellent manufacturer.

END OF SECTION 07 1900

**SECTION 07 2100
THERMAL INSULATION**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Board insulation at perimeter foundation wall and exterior wall behind _____ wall finish.

1.02 RELATED REQUIREMENTS

1.03 REFERENCE STANDARDS

- A. ASTM C578 - Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation; 2023.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide data on product characteristics, performance criteria, and product limitations.
- C. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

1.05 FIELD CONDITIONS

- A. Do not install insulation adhesives when temperature or weather conditions are detrimental to successful installation.

PART 2 PRODUCTS

2.01 APPLICATIONS

- A. Insulation at Perimeter of Foundation: Extruded polystyrene (XPS) board.

2.02 FOAM BOARD INSULATION MATERIALS

- A. Extruded Polystyrene (XPS) Board Insulation: Comply with ASTM C578 with either natural skin or cut cell surfaces.
 - 1. Type and Compressive Resistance: Type IV, 25 psi (173 kPa), minimum.
 - 2. Type and Thermal Resistance, R-value: Type IV, 5.0 (0.88), minimum, per 1 inch thickness at 75 degrees F mean temperature.
 - 3. Board Edges: Square.
 - 4. Type and Water Absorption: Type XII, 0.3 percent by volume, maximum, by total immersion.
 - 5. Products:
 - a. DuPont de Nemours, Inc; Styrofoam Brand ____: building.dupont.com/#sle.
 - b. Kingspan Insulation LLC; GreenGuard GG25-LG XPS Insulation Board: www.kingspan.com/#sle.
 - c. Kingspan Insulation LLC; GreenGuard XPS TYPE VI 40 PSI: www.trustgreenguard.com/#sle.
 - d. Owens Corning Corporation; FOAMULAR Type ___ Extruded Polystyrene (XPS) Insulation: www.ocbuildingspec.com/#sle.
 - e. Substitutions: See Section 01 6000 - Product Requirements.

2.03 ACCESSORIES

- A. Acoustic Caulk and Outlet Putty Packs: In accordance to Section 09 2116 Gypsum Board Assemblies.
- B. Adhesive: Type recommended by insulation manufacturer for application.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that substrate, adjacent materials, and insulation materials are dry and that substrates are ready to receive insulation.
- B. Verify substrate surfaces are flat, free of honeycomb, fins, irregularities, or materials or substances that may impede adhesive bond.

3.02 BOARD INSTALLATION AT EXTERIOR WALLS

- A. Adhere 6 inches wide strip of polyethylene sheet over expansion joints with double beads of adhesive each side of joint.
- B. Apply adhesive to back of boards:
- C. Install boards horizontally on walls.
 - 1. Place boards to maximize adhesive contact.
 - 2. Butt edges and ends tightly to adjacent boards and protrusions.
- D. Extend boards over expansion joints, unbonded to wall on one side of joint.
- E. Cut and fit insulation tightly to protrusions or interruptions to the insulation plane.

3.03 FIELD QUALITY CONTROL

- A. See Section 01 4000 - Quality Requirements for additional requirements.

3.04 PROTECTION

- A. Do not permit installed insulation to be damaged prior to its concealment.

END OF SECTION 07 2100

**SECTION 07 2129
SPRAYED INSULATION**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Cellulosic insulation placed in walls.
- B. Surface sealer.

1.02 REFERENCE STANDARDS

- A. ASTM C177 - Standard Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded-Hot-Plate Apparatus; 2019, with Editorial Revision (2023).
- B. ASTM C739 - Standard Specification for Cellulosic Fiber Loose-Fill Thermal Insulation; 2021a.
- C. ASTM D1622 - Standard Test Method for Apparent Density of Rigid Cellular Plastics; 2020.
- D. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2023d.
- E. ASTM E136 - Standard Test Method for Assessing Combustibility of Materials Using a Vertical Tube Furnace at 750 Degrees C; 2024.

1.03 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on materials, describing insulation properties.
- C. Manufacturer's Qualification Statement.
- D. Installer's Qualification Statement.

1.04 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years of documented experience.
- B. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years of documented experience.

1.05 FIELD CONDITIONS

- A. Maintain acceptable ambient and substrate surface temperatures prior to, during, and after installation of primer and insulation materials and sealer.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Cellulosic Fiber Sprayed Insulation:
 - 1. International Cellulose Corp; K-13: www.spray-on.com/#sle.
 - 2. Substitutions: See Section 01 6000 - Product Requirements.

2.02 MATERIALS

- A. Cellulosic Fiber Insulation: ASTM C739; treated cellulosic fiber, black color.
 - 1. Application location: Cafetorium and stage bottom of roof decks.
 - 2. Thermal Resistance (R-value): 3.9, at 1 inch thick when tested in accordance with ASTM C177 at 75 degrees F temperature
 - 3. Density: 2 lb/cu ft, when tested in accordance with ASTM D1622.
 - 4. Noise Reduction Coefficient (NRC): 0.75 for 1 inch thickness.
 - 5. Moisture Absorption: Maximum 15 percent by weight.
 - 6. Flame Spread / Smoke Developed Index: 0-25 / 0-450, Class A, when tested in accordance with ASTM E84.
 - 7. Combustibility: Passing ASTM E136.

2.03 ACCESSORIES

- A. Primer: As required by insulation manufacturer.
- B. Surface Sealer: Clear, latex based for placement over insulation.
- C. Insulation Stop: Plastic, profiled and sized to suit rafter spacing and wall/sloped roof configuration.

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.

3.02 PREPARATION

- A. Mask and protect adjacent surfaces from overspray or damage.
- B. Apply primer in accordance with manufacturer's instructions.
- C. Install insulation stops between rafters at wall/sloped roof construction to prevent insulation from covering soffit vents or from limiting air circulation from soffit to attic space.

3.03 INSTALLATION

- A. Install sprayed insulation in accordance with manufacturer's instructions.
- B. Install sprayed insulation to a uniform monolithic density without voids.
- C. Install to a minimum cured thickness of 1 inch.

3.04 FIELD QUALITY CONTROL

- A. Inspection will include verification of sprayed insulation and surface sealer thickness and density.

3.05 PROTECTION

- A. Do not permit subsequent construction work to disturb applied sprayed insulation.

END OF SECTION 07 2129

**SECTION 07 2400
EXTERIOR INSULATION AND FINISH SYSTEMS**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Composite wall cladding of rigid insulation and reinforced finish coating (Class PB).
- B. Drainage and water-resistive barriers behind insulation board.

NOTE: THERE WILL BE MULTIPLE FINISH COAT COLORS. PLAN ACCORDINGLY.

1.02 RELATED REQUIREMENTS

- A. Section 04 2000 Unit Masonry
- B. Section 05 4000 - Cold-Formed Metal Framing: Sheathing on metal studs.
- C. Section 07 6200 - Sheet Metal Flashing and Trim: Perimeter flashings.
- D. Section 07 9200 - Joint Sealants: Sealing joints between EIFS and adjacent construction and penetrations through EIFS.

1.03 REFERENCE STANDARDS

- A. ASTM B117 - Standard Practice for Operating Salt Spray (Fog) Apparatus; 2019.
- B. ASTM C578 - Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation; 2023.
- C. ASTM C1397 - Standard Practice for Application of Class PB Exterior Insulation and Finish Systems (EIFS) and EIFS with Drainage; 2013 (Reapproved 2019).
- D. ASTM D968 - Standard Test Methods for Abrasion Resistance of Organic Coatings by Falling Abrasive; 2022.
- E. ASTM D2247 - Standard Practice for Testing Water Resistance of Coatings in 100 % Relative Humidity; 2015 (Reapproved 2020).
- F. ASTM D3273 - Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber; 2021.
- G. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2023d.
- H. ASTM E331 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference; 2000 (Reapproved 2023).
- I. ASTM E1677 - Standard Specification for Air Barrier (AB) Material or Assemblies for Low-Rise Framed Building Walls; 2023.
- J. ASTM E2273 - Standard Test Method for Determining the Drainage Efficiency of Exterior Insulation and Finish Systems (EIFS) Clad Wall Assemblies; 2018.
- K. ASTM E2486/E2486M - Standard Test Method for Impact Resistance of Class PB and PI Exterior Insulation and Finish Systems (EIFS); 2022.
- L. ASTM G153 - Standard Practice for Operating Enclosed Carbon Arc Light Apparatus for Exposure of Nonmetallic Materials; 2013 (Reapproved 2021).
- M. ASTM G155 - Standard Practice for Operating Xenon Arc Lamp Apparatus for Exposure of Materials; 2021.
- N. ICC-ES AC219 - Acceptance Criteria for Exterior Insulation and Finish Systems; 2009, with Editorial Revision (2022).
- O. ICC-ES AC235 - Acceptance Criteria for EIFS Clad Drainage Wall Assemblies; 2015, with Editorial Revision (2022).
- P. NFPA 259 - Standard Test Method for Potential Heat of Building Materials; 2023, with Errata.
- Q. NFPA 268 - Standard Test Method for Determining Ignitability of Exterior Wall Assemblies Using a Radiant Heat Energy Source; 2022.

- R. NFPA 285 - Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Wall Assemblies Containing Combustible Components; 2023.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide data on system materials, product characteristics, performance criteria, and system limitations.
- C. Shop Drawings: Indicate wall and soffit joint patterns, joint details, and molding profiles.
- D. Verification Samples: Submit actual samples of selected coating on specified substrate, minimum 12 inches square, illustrating project colors and textures.

1.05 QUALITY ASSURANCE

- A. EIFS Manufacturer Qualifications: Provide EIFS products other than insulation from the same manufacturer with qualifications as follows:
 - 1. Manufacturer of EIFS products for not less than 5 years.
- B. Insulation Manufacturer Qualifications: Approved by manufacturer of EIFS and approved and labeled under third party quality program as required by applicable building code.
- C. Installer Qualifications: Company specializing in the type of work specified and with at least three years of documented experience.

1.06 MOCK-UPS

- A. Construct mock-up of typical EIFS application on specified substrate, size as indicated on drawings, and including flashings, joints, and edge conditions.
- B. Locate mock-up as indicated on drawings.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Delivery: Deliver materials to project site in manufacturer's original, unopened containers with labels intact. Inspect materials and notify manufacturer of any discrepancies.
- B. Storage: Store materials as directed by manufacturer's written instructions.

1.08 FIELD CONDITIONS

- A. Do not prepare materials or apply EIFS under conditions other than those described in the manufacturer's written instructions.
- B. Do not prepare materials or apply EIFS during inclement weather unless areas of installation are protected. Protect installed EIFS areas from inclement weather until dry.
- C. Do not install coatings or sealants when ambient temperature is below 40 degrees F.
- D. Do not leave installed insulation board exposed to sunlight for extended periods of time.

1.09 WARRANTY

- A. See Section 01 7800 - Closeout Submittals for additional warranty requirements.
- B. Provide manufacturer's standard material warranty, covering a period of not less than 12 years.
- C. Provide separate warranty from installer covering labor for repairs or replacement for a period of not less than 5 years.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Basis of Design:
 - 1. Dryvit Systems, Inc; Dryvit Outsulation EIFS, Class PB: www.dryvit.com/#sle.
- B. Other Acceptable Exterior Insulation and Finish Systems Manufacturers:
 - 1. Parex USA, Inc; www.parex.com/#sle.
 - 2. Sto Corp: www.stocorp.com/#sle.
 - 3. Substitutions: See Section 01 6000 - Product Requirements.

2.02 EXTERIOR INSULATION AND FINISH SYSTEM

- A. Exterior Insulation and Finish System: DRAINAGE type; reinforced finish coating on mechanically-fastened insulation board over sheet-type combination drainage layer/water-resistive barrier over substrate; provide a complete system that has been tested to show compliance with the following characteristics; include all components of specified system and substrate(s) in tested samples.
- B. Fire Characteristics:
 - 1. Flammability: Pass, when tested in accordance with NFPA 285.
 - 2. Ignitibility: No sustained flaming when tested in accordance with NFPA 268.
 - 3. Potential Heat of Foam Plastic Insulation Tested Independently of Assembly: No portion of the assembly having potential heat that exceeds that of the insulation sample tested for flammability (above), when tested in accordance with NFPA 259 with results expressed in Btu per square foot.
- C. Water Penetration Resistance: No water penetration beyond the plane of the base coat/insulation board interface after 15 minutes, when tested in accordance with ASTM E331 at 6.24 psf differential pressure with tracer dye in the water spray; include in tested sample at least two vertical joints and one horizontal joint of same type to be used in construction; disassemble sample if necessary to determine extent of water penetration.
- D. Drainage Efficiency: Average minimum efficiency of 90 percent, when tested in accordance with ASTM E2273 for 75 minutes.
- E. Salt Spray Resistance: No cracking, checking, crazing, erosion, blistering, peeling, delamination, or corrosion of finish coating after 300 hours exposure in accordance with ASTM B117, using at least three samples matching intended assembly, at least 4 by 6 inches in size.
- F. Freeze-Thaw Resistance: No cracking, checking, crazing, erosion, blistering, peeling, delamination, or corrosion of finish coating when viewed under 5x magnification after 10 cycles, when tested in accordance with ICC-ES AC219 or ICC-ES AC235.
- G. Weathering Resistance: No cracking, checking, crazing, erosion, blistering, peeling, delamination, or corrosion of finish coating when viewed under 5x magnification after 2000 hours of accelerated weathering conducted in accordance with ASTM G153 Cycle 1 or ASTM G155 Cycles 1, 5, or 9.
- H. Water Degradation Resistance: No cracking, checking, crazing, erosion, blistering, peeling, delamination, or corrosion of finish coating after 14 days exposure, when tested in accordance with ASTM D2247.
- I. Mildew Resistance: No growth supported on finish coating during 28 day exposure period, when tested in accordance with ASTM D3273.
- J. Abrasion Resistance Of Finish: No cracking, checking or loss of film integrity when tested in accordance with ASTM D968 with 113.5 gallons of sand.
- K. Impact Resistance: Construct system to provide the following impact resistance without exposure of broken reinforcing mesh, when tested in accordance with ASTM E2486/E2486M:
 - 1. Standard: 25 to 49 in-lb, for areas not indicated as requiring higher impact resistance.
 - 2. High: 90 to 150 in-lb, for areas indicated on the drawings.
- L. Exterior Insulation and Finish System Over Concrete Masonry Units (CMU):
 - 1. Basis of Design: StoTherm ci
 - 2. Components:
 - a. Air & Moisture Barrier - Wall Membrane: Sto Gold Coat
 - b. Air & Moisture Barrier - Sheathing Joints & Corners: Sto RapidGuard™
 - c. Air & Moisture Barrier - Rough Opening Protection: Sto RapidGuard™
 - d. Air & Moisture Barrier - Flashing and Penetration: Sto RapidGuard™
 - e. Air & Moisture Barrier - Dynamic Joints and Seams: StoGuard Transition Membrane
 - f. Adhesive: Sto TurboStick
 - g. Rigid Insulation
 - h. Mesh: Sto Mesh

- i. Basecoat: Sto BTS Plus
 - j. Primer: StoPrime® Sand
 - k. Finish: Stolit 1.5
3. Substitutions: See Section 01 6000-Product Requirements.

2.03 MATERIALS

- A. Finish Coating Top Coat: Water-based, air curing, acrylic or polymer-based finish with integral color and texture.
 1. Texture: Medium.
 2. Color Schedule (as indicated on drawings)(Note: multiple colors are in use. Pan accordingly):
 - a. Color 5: To be selected by architect
 - b. Color 6: To be selected by archite.
- B. Base Coat: Fiber-reinforced, acrylic or polymer-based product compatible with insulation board and reinforcing mesh, Class PB.
- C. Reinforcing Mesh: Balanced, open weave glass fiber fabric, treated for compatibility and improved bond with coating, weight, strength, and number of layers as required to meet required system impact rating.
- D. Extruded Polystyrene (XPS) Board Insulation: Complies with ASTM C578, with natural skin surfaces.
 1. Board Thickness: 2 inches.
 2. Board Edges: Square.
 3. Type and Compressive Resistance: Type VI, 40 psi (276 kPa), minimum.
 4. Type and Board Density: Type VI, 1.80 pcf (29 kg/cu m), minimum.
 5. Type and Water Absorption: Type VI, 0.3 percent by volume, maximum, by total immersion.
 6. Surface Burning Characteristics: Flame spread/Smoke developed index of 25/450, when tested in accordance with ASTM E84.
- E. Combination Drainage Layer/Water-Resistive Barrier: Air- and water-resistive sheet complying with ASTM E1677 Type I, dimpled or otherwise profiled to maintain air and drainage space between insulation board and sheathing; minimum water vapor permeance of 20 perms; furnished or approved by EIFS manufacturer.

2.04 ACCESSORIES

- A. Insulation Fasteners: Fastener and plate system appropriate for substrate and as recommended by EIFS manufacturer.
- B. Trim: EIFS manufacturer's standard PVC or galvanized steel trim accessories, as required for a complete project and including starter track and drainage accessories.
- C. Sealant Materials: Compatible with EIFS materials and as recommended by EIFS manufacturer.
- D. Reveals: Exterior facade to be a surface mounted channel reveal.
 1. Basis of Design: ClarkDietrich; www.clarkdietrich.com/products/channel-reveal-surface-mount
 - a. Channel reveal designed for surface-mount applications. Provide a rigid backing or blocking material behind surface-mounted reveal.
 - b. Caulk all intersections, butt joints, ends, and corners at the time of installation.
 2. Substitutions: See Section 01 6000-Product Requirements.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that substrate is sound and free of oil, dirt, other surface contaminants, efflorescence, loose materials, or protrusions that could interfere with EIFS installation and is of a type and construction that is acceptable to EIFS manufacturer. Do not begin work until substrate and adjacent materials are complete and thoroughly dry.

- B. Verify that substrate surface is flat, with no deviation greater than 1/4 in when tested with a 10 ft straightedge.

3.02 INSTALLATION - GENERAL

- A. Install in accordance with EIFS manufacturer's instructions and ASTM C1397.
 - 1. Where different requirements appear in either document, comply with the most stringent.
 - 2. Neither of these documents supercedes provisions of Contract Documents that defines contractual relationships between parties or scope of this work.

3.03 INSTALLATION - WATER-RESISTIVE BARRIER

- A. Mechanically attach sheet materials to substrate using fasteners and fastener spacing recommended by EIFS manufacturer.
- B. Seal substrate transitions and intersections with other materials to form continuous water-resistive barrier on exterior of sheathing, using method recommended by manufacturer.
- C. At door and window rough openings and other wall penetrations, seal water-resistive barrier and flexible flashings to rough opening before installation of metal flashings, sills, or frames, using method recommended by manufacturer.
- D. Lap flexible flashing or flashing tape at least 2 inches on each side of joint or transition.

3.04 INSTALLATION - INSULATION

- A. Install in accordance with manufacturer's instructions.
- B. Install back wrap reinforcing mesh at all openings and terminations that are not to be protected with trim.
- C. On wall surfaces, install boards horizontally.
- D. Place boards in a method to maximize tight joints. Stagger vertical joints and interlock at corners. Butt edges and ends tight to adjacent board and to protrusions. Achieve a continuous flush insulation surface, with no gaps in excess of 1/16 inch.
- E. Fill gaps greater than 1/16 inch with strips or shims cut from the same insulation material.
- F. Rasp irregularities off surface of installed insulation board.
- G. Mechanical Fastening: Space fasteners as recommended by EIFS manufacturer.

3.05 INSTALLATION - CLASS PB FINISH

- A. Base Coat: Apply in thickness as necessary to fully embed reinforcing mesh, wrinkle free, including back-wrap at terminations of EIFS. Install reinforcing fabric as recommended by EIFS manufacturer.
 - 1. Lap reinforcing mesh edges and ends a minimum of 2-1/2 inches.
 - 2. Allow base coat to dry a minimum of 24 hours before next coating application.
- B. Apply finish coat after base coat has dried not less than 24 hours, embed finish aggregate, and finish to a uniform texture and color.
- C. Finish Coat Thickness: As recommended by manufacturer.
- D. Seal control and expansion joints within the field of exterior finish and insulation system, using procedures recommended by sealant and finish system manufacturers.

3.06 CLEANING

- A. See Section 01 7000 - Execution and Closeout Requirements for additional requirements.
- B. Clean EIFS surfaces and work areas of foreign materials resulting from EIFS operations.

3.07 PROTECTION

- A. Protect completed work from damage and soiling by subsequent work.

END OF SECTION 07 2400

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**SECTION 07 2410
TEXTURED ACRYLIC FINISHING SYSTEM - ICF**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. This Section includes the following:
 - 1. Textured acrylic finishing system applied over the following:
 - a. Insulated concrete form without additional layers of EPS U.N.O.
 - b. Additional layers of EPS foam insulation board to provide profile per drawings.

NOTE: THERE WILL BE MULTIPLE FINISH COAT COLORS. PLAN ACCORDINGLY.

1.02 RELATED REQUIREMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
- B. Division 7 Section "Joint Sealants" for sealing joints in TAFS with elastomeric joint sealants.
- C. Division 3 Section "Insulating Concrete Forms" for system substrate.

1.03 DEFINITIONS

- A. TAFS: Textured Acrylic Finish System.
- B. Substrate: Insulated Concrete Form System.

1.04 PERFORMANCE REQUIREMENTS

- A. TAFS Performance: Comply with the following:
 - 1. Bond Integrity: Free from bond failure within components or between system and supporting wall construction, resulting from exposure to fire, wind loads, weather, or other in-service conditions.
 - 2. Weathertightness: Resistant to water penetration from exterior into TAFS and assemblies behind it or through them into interior of building that results in deterioration of thermal-insulating effectiveness or other degradation of TAFS and assemblies behind it, including substrates, supporting wall construction, and interior finish.
 - 3. Abrasion Resistance: Sample consisting of 1-inch- (25.4-mm-) thick TAFS mounted on 1/2-inch- (12.7-mm-) thick gypsum board; cured for a minimum of 28 days; and showing no cracking, checking, or loss of film integrity after exposure to 528 quarts (500 L) of sand when tested per ASTM D 968, Method A.
 - 4. Accelerated Weathering Characteristics: astm 6155 - 5000 hours.
 - 5. Absorption-Freezing Resistance: No visible deleterious effects and negligible weight loss after 60 cycles per ASTM C67.
 - 6. Mildew Resistance of Finish Coat: Sample applied to 2-by-2-inch (50.8-by-50.8-mm) clean glass substrate, cured for 28 days, and showing no growth when tested per ASTM D 3273.
 - 7. Salt-Spray Resistance: Sample consisting of 1-inch- (25.4-mm-) thick TAFS mounted on 1/2-inch- (12.7-mm-) thick gypsum board; cured for 28 days; and showing no cracking, checking, crazing, erosion, rusting, blistering, peeling, or delamination after testing for 300 hours per ASTM B 117.
 - 8. Water Penetration: Sample consisting of 1-inch- (25.4-mm-) thick TAFS mounted on 1/2-inch- (12.7-mm-) thick gypsum board, cured for 28 days, and showing no water penetration into the plane of the base coat to expanded polystyrene board interface of the test specimen after 15 minutes at 6.24 lbf/sq. ft. (299 Pa) of air pressure difference or 20 percent of positive design wind pressure, whichever is greater, across the specimen during a test period when tested per EIMA 101.02.
 - 9. Water Resistance: Sample consisting of 1-inch- (25.4-mm-) thick TAFS mounted on 1/2-inch- (12.7-mm-) thick gypsum board; cured for 28 days; and showing no cracking, checking, crazing, erosion, rusting, blistering, peeling, or delamination after testing for 14 days per ASTM D 2247.

10. Impact Resistance: Sample consisting of 1-inch- (25.4-mm-) thick TAFS when constructed, conditioned, and tested per EIMA 101.86; and meeting or exceeding the following impact classification and range:
 - a. High Impact Resistance: 90 to 150 inch-lb (10.2 to 17 J) minimum. Match requirements of 3.3.F for each specified surface area.

1.05 SUBMITTALS

- A. Product Data: For each type and component of TAFS indicated.
- B. Samples for Verification: 24-inch- (600-mm-) square panels for each type of finish-coat color and texture indicated, prepared using same tools and techniques intended for actual work.

1.06 QUALITY ASSURANCE

- A. Installer Qualifications: An installer who is certified in writing by TAFS manufacturer as qualified to install manufacturer's system using trained workers.
- B. Source Limitations: Obtain TAFS through one source from a single TAFS manufacturer and from sources approved by TAFS manufacturer as compatible with system components.
- C. Fire-Test-Response Characteristics: Provide TAFS and system components with the following fire-test-response characteristics as determined by testing identical TAFS and system components per test method indicated below by UL or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify products with appropriate markings of applicable testing and inspecting agency.
 1. Fire-Resistance Characteristics: Provide materials and construction tested for fire resistance per ASTM E 119.
 2. Surface-Burning Characteristics: Provide insulation board, adhesives, base coats, and finish coats with flame-spread index of 25 or less and smoke-developed index of 450 or less, per ASTM E 84.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in original, unopened packages with manufacturers' labels intact and clearly identifying products.
- B. Store materials inside and under cover; keep them dry and protected from weather, direct sunlight, surface contamination, aging, corrosion, damaging temperatures, construction traffic, and other causes.
 1. Protect plastic insulation against ignition at all times. Do not deliver plastic insulating materials to Project site before installation time.
 2. Complete installation and concealment of plastic materials as rapidly as possible in each area of construction.

1.08 PROJECT CONDITIONS

- A. Weather Limitations: Maintain ambient temperatures above 40 deg F (4.4 deg C) for a minimum of 24 hours before, during, and after adhesives or coatings are applied. Do not apply TAFS adhesives or coatings during rainfall. Proceed with installation only when existing and forecasted weather conditions and ambient outdoor air and substrate temperatures permit TAFS to be applied, dried, and cured according to manufacturers' written instructions and warranty requirements.
- B. Field Measurements: Verify actual dimensions required for prefabricated panels by field measurements before fabrication and indicate measurements on Shop Drawings.
 1. Established Dimensions: Where field measurements cannot be made without delaying the Work, establish dimensions and proceed with fabricating prefabricated panels without field measurements. Coordinate construction to ensure that actual dimensions correspond to established dimensions.

1.09 COORDINATION

- A. Coordinate installation of TAFS with related Work specified in other Sections to ensure that wall assemblies, including sheathing, water-/weather-resistive barrier, flashing, trim, joint sealants, windows, and doors, are protected against damage from the effects of weather, age, corrosion,

moisture, and other causes. Do not allow water to penetrate behind flashing and [protective coating of barrier TAFS.

- B. Coordinate panel fabrication schedule with construction progress to avoid delaying the Work.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Class PB TAFS: Impact resistance levels at zones indicated on drawings.
 - a. Dryvit Systems, Inc.
 - b. Senergy Inc.; SKW-MBT Construction Chemicals.
 - c. Sto Corp.
 - d. Parexusa

2.02 MATERIALS

- A. Compatibility: Provide substrates, water-/weather-resistive barriers, adhesive, fasteners, board insulation, reinforcing meshes, base- and finish-coat systems, sealants, and accessories that are compatible with one another and approved for use by TAFS manufacturer for Project.
- B. Colors, Textures, and Patterns of Finish Coat: As selected by Architect from manufacturer's full range.
- C. Primer/Sealer: TAFS manufacturer's standard substrate conditioner designed to seal substrates from moisture penetration and to improve the bond between substrate of type indicated and adhesive used for application of insulation.
- D. Flexible-Membrane Flashing: Cold-applied, fully self-adhering, self-healing, rubberized-asphalt and polyethylene-film composite sheet or tape and primer; TAFS manufacturer's standard or product recommended in writing by TAFS manufacturer.
- E. Adhesive for Application of Insulation: TAFS manufacturer's standard formulation designed for indicated use, compatible with substrate, and complying with[one of] the following requirements:
 - 1. Factory-mixed noncementitious formulation designed for adhesive attachment of insulation to substrates of type indicated, as recommended by TAFS manufacturer.
- F. Molded, Rigid Cellular Polystyrene Board Insulation: Comply with TAFS manufacturer's requirements, ASTM C 578 for Type I, and EIMA's "EIMA Guideline Specification for Expanded Polystyrene (EPS) Insulation Board" for more stringent requirements for material performance and qualities of insulation, including dimensions and permissible variations, and the following:
 - 1. Aging: Before cutting and shipping, age insulation in block form by air drying for not less than six weeks or by another method approved by EIMA that produces equivalent results.
 - 2. Flame-Spread and Smoke-Developed Indexes: 25 and 450 or less, respectively, per ASTM E 84.
 - 3. Dimensions: Provide insulation boards not more than 24 by 48 inches (610 by 1219 mm) and in thickness indicated but not more than 4 inches (102 mm) thick or less than thickness allowed by ASTM C 1397.
- G. Reinforcing Mesh: Balanced, alkali-resistant, open-weave glass-fiber mesh treated for compatibility with other TAFS materials, made from continuous multiend strands with retained mesh tensile strength of not less than 120 lbf/in. (21 dN/cm) per EIMA 105.01, complying with ASTM D 578 and the following requirements for minimum weight:
- H. Base-Coat Materials: TAFS manufacturer's standard mixture complying with[one of] the following requirements for material composition and method of combining materials:
 - 1. Factory-mixed noncementitious formulation of polymer-emulsion adhesive and inert fillers that is ready to use without adding other materials.
- I. Waterproof Adhesive/Base-Coat Materials: TAFS manufacturer's standard waterproof mixture complying with[one of] the following requirements for material composition and method of combining materials:

1. Job-mixed formulation of portland cement complying with ASTM C 150, Type I, white or natural color; and manufacturer's standard polymer-emulsion adhesive designed for use indicated.
- J. Primer: TAFS manufacturer's standard factory-mixed elastomeric-polymer primer for preparing base-coat surface for application of finish coat.
- K. Finish-Coat Materials: TAFS manufacturer's standard acrylic-based coating complying with the following requirements for material composition and method of combining materials:
 1. Factory-mixed formulation of polymer-emulsion binder, colorfast mineral pigments, sound stone particles, and fillers.
 2. Sealer: Manufacturer's waterproof, clear acrylic-based sealer for protecting finish coat.
 3. Colors: As indicated on drawings.
 - a. Note: There will be multiple colors. Plan accordingly.
- L. Water: Potable.
- M. Mechanical Fasteners: TAFS manufacturer's standard corrosion-resistant fasteners consisting of thermal cap, standard washer and shaft attachments, and fastener indicated below; selected for properties of pullout, tensile, and shear strength required to resist design loads of application indicated; capable of pulling fastener head below surface of insulation board; and of the following description:
 1. For attachment to steel studs from 0.033 to 0.112 inch (0.84 to 2.84 mm) in thickness, provide steel drill screws complying with ASTM C 954.
 2. For attachment to light-gage steel framing members not less than 0.0179 inch (0.45 mm) in thickness, provide steel drill screws complying with ASTM C 1002.
- N. Trim Accessories: Type as designated or required to suit conditions indicated and to comply with TAFS manufacturer's written requirements; manufactured from UV-stabilized PVC; and complying with ASTM D 1784, manufacturer's standard Cell Class for use intended, and ASTM C 1063.
 1. Casing Bead: Prefabricated one-piece type for attachment behind insulation, of depth required to suit thickness of coating and insulation, with face leg perforated for bonding to coating and back leg.
 2. Drip Screed/Track: Prefabricated one-piece type for attachment behind insulation with face leg extended to form a drip, of depth required to suit thickness of coating and insulation, with face leg perforated for bonding to coating and back leg.
 3. Expansion Joint: Prefabricated one-piece V profile; designed to relieve stress of movement.
- O. Reveals: Exterior facade to be a surface mounted channel reveal.
 1. Basis of Design: ClarkDietrich; www.clarkdietrich.com/products/channel-reveal-surface-mount
 - a. Channel reveal designed for surface-mount applications. Provide a rigid backing or blocking material behind surface-mounted reveal.
 - b. Vent clips are provided with vented channel reveals to connect reveal sections and assist in alignment.
 - c. Caulk all intersections, butt joints, ends, and corners at the time of installation.
 2. Substitutions: See Section 01 6000-Product Requirements.

2.03 ELASTOMERIC SEALANTS

- A. Elastomeric Sealant Products: Provide TAFS manufacturer's listed and recommended chemically curing, elastomeric sealant that is compatible with joint fillers, joint substrates, and other related materials, and complies with requirements for products and testing indicated in EIMA's "EIMA Guide for Use of Sealants with Textured Acrylic Finish Systems," and with requirements in Division 7 Section "Joint Sealants" for products corresponding to description indicated below:
 1. Low-modulus, multicomponent, nonsag urethane sealant.
- B. Sealant Color: To match TAFS system.

2.04 MIXING

- A. General: Comply with TAFS manufacturer's requirements for combining and mixing materials. Do not introduce admixtures, water, or other materials except as recommended by TAFS manufacturer. Mix materials in clean containers. Use materials within time period specified by TAFS manufacturer or discard.
- B. Source Quality Control: Owner will engage a qualified independent testing and inspecting agency to perform shop tests and inspections indicated below and prepare test reports.
 - 1. Testing and inspecting agency shall interpret tests and report whether tested Work complies with or deviates from requirements.
 - 2. Correct deficiencies in TAFS that inspections and test reports indicate do not comply with requirements.
 - 3. Additional inspection and testing, at Contractor's expense, shall be performed to determine compliance of corrected Work with requirements.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of TAFS.
- B. Examine roof edges, wall framing, flashings, openings, substrates, and junctures at other construction for suitable conditions where TAFS will be installed.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION

- A. Protect contiguous work from moisture deterioration and soiling caused by application of TAFS. Provide temporary covering and other protection needed to prevent spattering of exterior finish coats on other work.
- B. Protect TAFS, substrates, and wall construction behind them from inclement weather during installation. Prevent penetration of moisture behind TAFS and deterioration of substrates.
- C. The entire surface of the ICF shall be rasped to remove any UV degradation and provide a smooth planer application surface.
- D. Prepare and clean substrates to comply with TAFS manufacturer's written requirements to obtain optimum bond between substrate and adhesive for insulation.
- E. Primer/Sealer: Apply over gypsum sheathing substrates to protect substrates from degradation and where required by TAFS manufacturer for improving adhesion of insulation to substrate.
- F. Flexible-Membrane Flashing: Install over weather-resistive barrier, applied and lapped to shed water; seal at openings, penetrations, terminations, and where indicated by TAFS manufacturer's written instructions to protect wall assembly from degradation. Prime substrates, if required, and install flashing to comply with TAFS manufacturer's written instructions and details.
- G. All voids and gaps greater than 1/16" in the IDF shall be slivered and filled using additional insulation. Base coat material shall not be used for leveling. The ICF surface must be brought to plane prior to installation of TAFS.

3.03 TAFS INSTALLATION

- A. General: Comply with ASTM C 1397 and TAFS manufacturer's written instructions for installation of TAFS as applicable to each type of substrate indicated.
- B. Trim: Apply trim accessories at perimeter of TAFS, at expansion joints,[at window sills,] and elsewhere as indicated, according to TAFS manufacturer's written instructions. Coordinate with installation of insulation.
 - 1. Drip Screed/Track: Use at bottom edges of TAFS, unless otherwise indicated.
 - 2. Casing Bead: Use at other locations of the ICF

- C. Board Insulation: Adhesively and mechanically attach insulation to substrate in compliance with ASTM C 1397, TAFS manufacturer's written requirements, and the following:
1. Apply adhesive to ridges on back of insulation by notched-trowel method in a manner that results in full adhesive contact over the entire surface of ridges, leaving channels free of adhesive once insulation is adhered to substrate.
 2. Press and slide insulation into place. Apply pressure over the entire surface of insulation to accomplish uniform contact, high initial grab, and overall level surface.
 3. Allow adhered insulation to remain undisturbed for period recommended by TAFS manufacturer, but not less than 24 hours, before installing mechanical fasteners, beginning rasping and sanding insulation, or applying base coat and reinforcing mesh.
 4. Rasp or sand flush entire surface of insulation to remove irregularities projecting more than 1/32 inch from surface of insulation and to remove yellowed areas due to sun exposure; do not create depressions deeper than 1/16 inch.
 5. Cut aesthetic reveals in outside face of insulation with high-speed router and bit configured to produce grooves, rabbets, and other features that comply with profiles and locations indicated. Do not reduce insulation thickness at aesthetic reveals to less than 3/4 inch (19 mm).
 6. Form joints for sealant application by leaving gaps between adjoining insulation edges and between insulation edges and dissimilar adjoining surfaces. Make gaps wide enough to produce joint widths indicated after encapsulating joint substrates with base coat and reinforcing mesh.
 7. After installing insulation and before applying field-applied reinforcing mesh, fully wrap board edges. Cover edges of board and extend encapsulating mesh not less than 2-1/2 inches over front and back face, unless otherwise indicated on Drawings.
 8. Treat exposed edges of insulation as follows:
 - a. Except for edges forming substrates of sealant joints, encapsulate with base coat, reinforcing mesh, and finish coat.
 - b. Encapsulate edges forming substrates of sealant joints within TAFS or between TAFS and other work with base coat and reinforcing mesh.
 - c. At edges trimmed by accessories, extend base coat, reinforcing mesh, and finish coat over face leg of accessories.
 9. Coordinate installation of flashing and insulation to produce wall assembly that does not allow water to penetrate behind flashing and.
- D. Expansion Joints: Install at locations indicated, where required by TAFS manufacturer, and as follows:
1. Where expansion joints are indicated in substrates behind TAFS.
 2. Where wall height changes.
- E. Base Coat: Apply to exposed surfaces of insulation in minimum thickness recommended in writing by TAFS manufacturer, but not less than 1/16-inch dry-coat thickness.
- F. Reinforcing Mesh: Embed type indicated below in wet base coat to produce wrinkle-free installation with mesh continuous at corners and overlapped not less than 2-1/2 inches (64 mm) or otherwise treated at joints to comply with ASTM C 1397 and TAFS manufacturer's written requirements. Do not lap reinforcing mesh within 8 inches (204 mm) of corners. Completely embed mesh, applying additional base-coat material if necessary, so reinforcing-mesh color and pattern are not visible.
1. All surfaces below top of accent band @ 22'-0" height (zone 1) to be Panzer 15 System.
 2. All surfaces above top of accent band @ 22'-0" height (Zone 2) to be Intermediate System.
 3. All surfaces above lower roof level (Zone 3) to be standard 146 System.
- G. Double-Layer Reinforcing Mesh Application: At Zone 1 and Zone 2 apply second base coat and second layer of intermediate-impact reinforcing mesh, overlapped not less than 2-1/2 inches (64 mm) or otherwise treated at joints to comply with ASTM C 1397 and TAFS manufacturer's written requirements in same manner as first application. Do not apply until first base coat has cured.

- H. Primer: Apply over dry base coat according to TAFS manufacturer's written instructions.
- I. Finish Coat: Apply over dry base coat, maintaining a wet edge at all times for uniform appearance, in thickness required by TAFS manufacturer to produce a uniform finish of color and texture matching approved sample and free of cold joints, shadow lines, and texture variations.
 - 1. Embed aggregate in finish coat according to TAFS manufacturer's written instructions to produce a uniform applied-aggregate finish of color and texture matching approved sample.
- J. Sealer Coat: Apply over dry finish coat, in number of coats and thickness required by TAFS manufacturer.

3.04 INSTALLATION OF JOINT SEALANTS

- A. Prepare joints and apply sealants, of type and at locations indicated, to comply with applicable requirements in Division 7 Section "Joint Sealants" and in EIMA's "EIMA Guide for Use of Sealants with Exterior Insulation and Finish Systems, Class PB."
 - 1. Clean surfaces to receive sealants to comply with indicated requirements and TAFS manufacturer's written instructions.
 - 2. Apply primer recommended in writing by sealant manufacturer for surfaces to be sealed.
 - 3. Install sealant backing to control depth and configuration of sealant joint and to prevent sealant from adhering to back of joint.
 - 4. Apply masking tape to protect areas adjacent to sealant joints. Remove tape immediately after tooling joints, without disturbing joint seal.
 - 5. Recess sealant sufficiently from surface of TAFS so an additional sealant application, including cylindrical sealant backing, can be installed without protruding beyond TAFS surface.
 - 6. Apply joint sealants after base coat has cured but before applying finish coat.

3.05 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified independent testing and inspecting agency to perform field tests and inspections and prepare test reports.
- B. Remove and replace TAFS where test results indicate that TAFS do not comply with specified requirements.
- C. Additional testing and inspecting, at Contractor's expense, shall be performed to determine compliance of replaced or additional work with specified requirements.

3.06 CLEANING AND PROTECTION

- A. Remove temporary covering and protection of other work. Promptly remove coating materials from window and door frames and other surfaces outside areas indicated to receive TAFS coatings.
- B. Provide final protection and maintain conditions, in a manner acceptable to Installer and TAFS manufacturer, that ensure that TAFS are without damage or deterioration at time of Substantial Completion.

END OF SECTION 07241 07 2410

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**SECTION 07 2500
WEATHER BARRIERS**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Vapor Retarders: Materials to make roof water vapor resistant and air tight.

1.02 DEFINITIONS

- A. Weather Barriers: Materials or assemblies forming water-resistive barriers, air barriers, vapor retarders, or combination of one or more assemblies.

1.03 REFERENCE STANDARDS

- A. ASTM D1970/D1970M - Standard Specification for Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection; 2021.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide data on material characteristics.
- C. Shop Drawings: Provide drawings of special joint conditions.

1.05 FIELD CONDITIONS

- A. Maintain temperature and humidity recommended by materials manufacturers before, during, and after installation.

PART 2 PRODUCTS

2.01 AIR BARRIER MATERIALS (WATER VAPOR PERMEABLE AND WATER-RESISTIVE)

- A. Air Barrier Sheet, Self-Adhered:
 - 1. Air Permeance: 0.004 cubic feet per minute per square foot, maximum, when tested in accordance with ASTM E2178.
 - 2. Water Vapor Permeance: 10 perms, minimum, when tested in accordance with ASTM E96/E96M Procedure A (desiccant procedure).
 - 3. Water Penetration Resistance Around Nails: Pass, when tested in accordance with ASTM D1970/D1970M (modified).
 - 4. Ultraviolet (UV) and Weathering Resistance: Approved in writing by manufacturer for up to 90 days of weather exposure.
 - 5. Surface Burning Characteristics: Flame spread index of 25 or less, smoke developed index of 450 or less (Class A), when tested in accordance with ASTM E84.
 - 6. Seam and Perimeter Tape: As recommended by sheet manufacturer.

2.02 ACCESSORIES

- A. Flexible Flashing: Self-adhering sheet flashing complying with ASTM D1970/D1970M; waive slip resistance requirement if not installed on roof.
 - 1. Width: 4 inches.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that surfaces and conditions comply with requirements of this section.

3.02 PREPARATION

- A. Remove projections, protruding fasteners, and loose or foreign matter that might interfere with proper installation.

3.03 INSTALLATION

- A. Install materials in accordance with manufacturer's installation instructions.
- B. Self-Adhered Sheets:
 - 1. Prepare substrate in accordance with sheet manufacturer's installation instructions; fill and tape joints in substrate and between dissimilar materials.

2. Lap sheets shingle-fashion to shed water and seal laps airtight.
3. Upon placement of sheets, firmly press onto substrate with resilient hand roller; ensure that laps are firmly adhered with no gaps or fishmouths.
4. Use same material, or other material approved by sheet manufacturer, to seal sheets to adjacent substrates, and as flashing.
5. At expansion joints, provide transition to joint assemblies approved by sheet manufacturer.

3.04 PROTECTION

- A. Do not leave materials exposed to weather longer than recommended by manufacturer.

END OF SECTION 07 2500

**SECTION 07 4213
METAL WALL AND SOFFIT PANELS**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Manufactured metal panels for exterior walls and soffits, with related flashings and accessory components.

1.02 RELATED REQUIREMENTS

- A. Section 07 2100 - Thermal Insulation.
- B. Section 07 2500 - Weather Barriers: Weather barrier under wall panels.
- C. Section 07 2700 - Air Barriers: Air barrier under wall panels.
- D. Section 07 9200 - Joint Sealants: Sealing joints between metal wall panel system and adjacent construction.
- E. Section 09 2116 - Gypsum Board Assemblies: Wall panel substrate.

1.03 REFERENCE STANDARDS

- A. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix); 2022.
- B. AAMA 609 & 610 - Cleaning and Maintenance Guide for Architecturally Finished Aluminum (Combined Document); 2015.
- C. ASTM A792/A792M - Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process; 2023.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Samples: Submit two samples of wall panel and soffit panel, 12 inches by 12 inches in size illustrating finish color, sheen, and texture.
- C. Manufacturer's qualification statement.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with minimum three years of documented experience.
- B. Installer Qualifications: Company specializing in installing products of the type specified in this section with minimum three years of documented experience and approved by manufacturer.

1.06 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.

1.07 WARRANTY

- A. See Section 01 7800 - Closeout Submittals for additional warranty requirements.
- B. Finish Warranty: Provide 15-year manufacturer warranty against excessive degradation of exterior finish. Include provision for replacement of units with excessive fading, chalking, or flaking. Complete forms in Owner's name and register with warrantor.

PART 2 PRODUCTS

2.01 METAL WALL PANEL SYSTEM

- A. Soffit Panels:
 - 1. UNEEKE Manufacturing, Soffit Panel, 1" Flush Panel.

2. Profile: Style as indicated on drawings. 12 or 16" panel width.
 3. Color: As indicated on drawings, to be selected from manufacturer's standard range.
- B. Trim: Same material, thickness and finish as exterior sheets; brake formed to required profiles.
- C. Anchors: Galvanized steel.

2.02 MATERIALS

- A. Precoated Steel Sheet: Aluminum-zinc alloy-coated steel sheet, ASTM A792/A792M, Commercial Steel (CS)) or Forming Steel (FS), with AZ50/AZM150 coating; continuous-coil-coated on exposed surfaces with specified finish coating and on panel back with specified panel back coating.
- B. Select materials with surface flatness, smoothness, and lack of surface blemishes where exposed to view in finished system.
- C. Galvanized metal Z-furring for attachment.

2.03 FINISHES

- A. Exposed Surface Finish: Panel manufacturer's standard polyvinylidene fluoride (PVDF) coating, top coat over epoxy primer.
- B. Panel Backside Finish: Panel manufacturer's standard siliconized polyester wash coat.
- C. Fluoropolymer Coil Coating System: Polyvinylidene fluoride (PVDF) multi-coat superior performing organic coatings system complying with AAMA 2605, including at least 70 percent PVDF resin, and at least 80 percent of coil coated metal surfaces having minimum total dry film thickness (DFT) of 0.9 mil, 0.0009 inch; color and gloss as selected by Architect from manufacturer's standard line.

2.04 ACCESSORIES

- A. Gaskets: Manufacturer's standard type suitable for use with system, permanently resilient; ultraviolet and ozone resistant.
1. Provide gaskets at all dissimilar metal connections.
- B. Concealed Sealants: Non-curing butyl sealant or tape sealant, see Section 07 9200
- C. Field Touch-up Paint: As recommended by panel manufacturer.

2.05 MOCK-UP

- A. Construct a masonry wall and metal panel as a mock-up panel sized 8 feet (2.4 m) long by 6 feet (1.8 m) high; include mortar, accessories, structural backup, metal panel and flashings (with lap joint, corner, and end dam) in mock-up. Can be built in-place. Combine with masonry mockup.
- B. Locate where directed.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that building framing members are ready to receive panels.
- B. Verify air barrier, see Section 07 2700, has been installed over wall panel substrate; see Section 05 4000.

3.02 PREPARATION

- A. Install subgirts perpendicular to panel length, securely fastened to substrates and shimmed and leveled to uniform plane, and spaced at intervals indicated.

3.03 INSTALLATION

- A. Install panels on soffits in accordance with manufacturer's instructions.
- B. Protect surfaces in contact with cementitious materials and dissimilar metals with bituminous paint; allow to dry prior to wall panel installation.
- C. Locate joints over supports.

- D. Use concealed fasteners unless otherwise indicated by Architect.
- E. Seal and place gaskets to prevent weather penetration. Maintain neat appearance.

3.04 CLEANING

- A. Remove site cuttings from finish surfaces.
- B. Remove protective material from wall panel surfaces.
- C. Clean and wash prefinished surfaces with mild soap and water; rinse with clean water.

END OF SECTION 07 4213

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**SECTION 07 5400
THERMOPLASTIC (KEE) MEMBRANE ROOFING - BASE BID**

PART 1 – GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Mechanically Fastened Membrane Roofing System.
 - 2. Roof Insulation.
 - 3. Vapor Retarder.
 - 4. FiberClad Coated Metal
 - 5. Tapered Roof Insulation
 - 6. Coverboard
 - 7. Walkways
- B. Related Sections:
 - 1. Division 01 – General Conditions.
 - 2. Division 06 – Wood, Plastics, and Composites.
 - 3. Division 07 – Thermal and Moisture Protection.
 - 4. Division 22 – Plumbing.
 - 5. Division 23 – HVAC.

1.02 REFERENCES

- A. Comply with all References in effect, most active, or latest version as of the date of the Contract Documents.
- B. American Society of Civil Engineers (ASCE) (www.asce.org) 7 - Minimum Design Loads for Buildings and Other Structures.
- C. ASTM International (ASTM) (www.astm.org):
 - 1. C578 - Standard Specification for Preformed Cellular Polystyrene Thermal Insulation.
 - 2. C1177 - Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing.
 - 3. C1278 - Standard Specification for Fiber-Reinforced Gypsum Panel.
 - 4. C1289 - Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board.
 - 5. C1549 - Standard Test Method for Determination of Solar Reflectance near Ambient Temperature Using a Portable Solar Reflectometer.
 - 6. D751 - Standard Test Methods for Coated Fabrics
 - 7. D882 - Standard Test Method for Tensile Properties of Thin Plastic Sheeting
 - 8. D1149 - Standard Test Methods for Rubber Deterioration - Cracking in an Ozone Controlled Environment.
 - 9. D1204 - Standard Test Method for Linear Dimensional Changes for Nonrigid Thermoplastic Sheeting or Film at Elevated Temperature.
 - 10. D2136 - Standard Test Method for Coated Fabrics - Low-Temperature Bend Test.
 - 11. D4397 - Standard specification for Polyethylene sheeting for construction, industrial and agricultural applications.
 - 12. D4434 - Standard Specification for Poly (Vinyl Chloride) Sheet Roofing.
 - 13. D5635 - Standard Test Method for Dynamic Puncture Resistance of Roofing Membrane Specimens.
 - 14. D6754 - Standard Specification for Ketone Ethylene Ester Based Sheet Roofing.
 - 15. E108 - Standard Test Methods for Fire Tests of Roof Coverings.
 - 16. E1980 - Standard Practice for Calculating Solar Reflectance Index of Horizontal and Low-Sloped Opaque Surfaces.
- D. Energy Star (www.energystar.gov) - Qualified Products.
- E. Factory Mutual Insurance Co. (FM) (www.fmglobal.com):
 - 1. 4470 - Approval Standard for Single-Ply, Polymer-Modified Bitumen Sheet, Built-Up Roof (BUR) and Liquid Applied Roof Assemblies for Use in Class 1 and Noncombustible Roof

Deck Construction.

2. Property Loss Prevention Data Sheet 1-28 - Design Wind Loads.
 3. Property Loss Prevention Data Sheet 1-49 - Perimeter Flashing.
- F. National Roofing Contractors Association (NRCA) - Roofing and Waterproofing Manual.
- G. NSF/ANSI 347 – Sustainability Assessment for Single Ply Membranes.
- H. 2010 Americans with Disabilities Act. (ADAAG) (www.ada.gov).
- I. 2015 International Building Code. (2015 IBC).

1.03 PERFORMANCE REQUIREMENTS

- A. General: Provide installed roofing membrane and base flashings that remain watertight; do not permit the passage of water; and resist specified uplift pressures, thermally induced movement, and exposure to weather without failure.
- B. Material Compatibility: Provide roofing materials that are compatible with one another under conditions of service and application required, as demonstrated by roofing membrane manufacturer based on testing and field experience.
- C. FMG Listing: Provide roofing membrane, base flashings, and component materials that comply with requirements in FMG 4450 and FMG 4470 as part of a membrane roofing system and that are listed in FMG's "Approval Guide" for Class 1 or noncombustible construction, as applicable. Identify materials with FMG markings.
1. Fire/Windstorm Classification: Class 1A-90.
 2. Hail Resistance: MH.
- D. Roofing System Design: Provide a membrane roofing system that is identical to systems that have been successfully tested by a qualified testing and inspecting agency to resist the factored design uplift pressures calculated according to SPRI's "Wind Load Design Guide for Fully Adhered and Mechanically Fastened Roofing Systems."

1.04 SUBMITTALS

- A. Under provisions of Division 01.
- B. Product Data: For each type of product indicated.
- C. Shop Drawings: For roofing system. Include plans, elevations, sections, details, and attachments to other Work.
1. Base flashings and membrane terminations.
 2. Tapered insulation, including slopes.
 3. Insulation fastening patterns.
- D. Samples for Verification: For the following products:
1. 12 by 12 inch square of sheet roofing, of color specified, including T-shaped side and end lap seam.
 2. 12 by 12-inch square of roof insulation.
 3. 12 by 12-inch (300-by-300-mm) square of walkway pads or rolls.
 4. 12 inch (300-mm) length of metal termination bars.
 5. Six (6) fasteners of each type.
- E. Installer Certificates: Signed by roofing system Manufacturer certifying that Installer is approved, authorized, or licensed by manufacturer to install roofing system.
- F. Manufacturer Certificates: Signed by roofing manufacturer certifying that roofing system complies with requirements specified in "Performance Requirements" Article.
1. Submit evidence of meeting performance requirements.
- G. Qualification Data: For Installer and manufacturer.
- H. Product Test Reports: Based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified testing agency, for components of roofing system.
- I. Maintenance Data: For roofing system to include in maintenance manuals.
- J. Warranties: Special warranties specified in this Section.

- K. Inspection Report: Copy of roofing system Manufacturer's inspection report of completed roofing installation.

1.05 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified firm that is approved, authorized, or licensed by roofing system Manufacturer to install Manufacturer's product and that is eligible to receive Manufacturer's warranty.
- B. Manufacturer Qualifications: A qualified manufacturer with 20 Years experience manufacturing the same membrane without formulation changes. The roofing membrane formulation and system shall be identical to that used for this Project, per applicable change, by law. The membrane and accessories must be produced by the warranted manufacturer. No Private Label Products will be accepted.
- C. Source Limitations: Obtain components for membrane roofing system approved by roofing membrane manufacturer.
- D. Fire-Test-Response Characteristics: Provide membrane roofing materials with the fire-test-response characteristics indicated as determined by testing identical products per test method below by UL, FMG, or another testing and inspecting agency acceptable to authorities having jurisdiction. Materials shall be identified with appropriate markings of applicable testing and inspecting agency.
 - 1. Exterior Fire-Test Exposure: Class A; ASTM E108, for application and roof slopes indicated.
- E. Pre-installation Conference: Conduct conference at Project site. Comply with requirements in Division 1 Section "Project Management and Coordination." Review methods and procedures related to roofing system including, but not limited to, the following:
 - 1. Meet with Owner, Architect, Owner's insurer if applicable, 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. Note: Contractor shall have written manufacturer specifications, roof drawings, roof drawing notes and scope of work of work on site during the construction period.
 - 3. Review and finalize a construction schedule and verification of material availability.
 - 4. Review structural loading limitations, prior to loading.
 - 5. Review all details, including base flashings, special details, roof drainage, roof penetration schedule, equipment curb and any conditions that will affect the roofs construction or integrity.
 - 6. Review Contractors Risk Management Plan and OSHA approved Safety Program
 - 7. Review roof observation and repair procedures during and after roof installation.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Deliver roofing materials to Project site in original containers with seals unbroken and labeled with manufacturer's name, product brand name and type, date of manufacture, and directions for storing and mixing with other components.
- B. Store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by roofing system manufacturer. Protect stored liquid material from direct sunlight.
 - 1. Discard and legally dispose of liquid material that cannot be applied within its stated shelf life.
- C. Protect roof insulation materials from physical damage and from deterioration by sunlight, moisture, soiling, and other sources. Store in a dry location. Comply with insulation manufacturer's written instructions for handling, storing, and protecting during installation.
- D. Handle and store roofing materials and place equipment in a manner to avoid permanent deflection of deck.

1.07 PROJECT CONDITIONS

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit roofing system to be installed according to manufacturer's written instructions and warranty requirements.

1.08 WARRANTY

- A. Special Warranty: Manufacturer's standard form, without monetary limitation, in which manufacturer agrees to repair or replace components of membrane roofing system that fail in materials or workmanship within specified warranty period. Failure includes roof leaks.
 - 1. Special warranty includes roofing membrane, base flashings, roofing membrane accessories, roof insulation, fasteners, walkway products and other components of membrane roofing system.
 - 2. Warranty Period: Twenty (20) Year NDL, Non-Prorated, from date of Substantial Completion.
 - 3. Warranty shall include a 1inch Hail Warranty and shall have no exclusions for ponding conditions.
- B. Special Project Warranty: Submit roofing Installer's warranty, on warranty form at end of this Section, signed by Installer, covering Work of this Section, including all components of membrane roofing system such as roofing membrane, base flashing, roof insulation, fasteners, cover boards, substrate boards, vapor retarders, roof pavers, and walkway products, for the following warranty period:
 - 1. Warranty Period: Two (2) years from date of Substantial Completion.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

- A. Design Basis: Contract Documents and are based on products by:
 - 1. Seaman Corporation - Fibertite. (www.fibertite.com).
 - a. ASTM D6754, Ketone Ethylene Ester (KEE) Sheet Roofing, FiberTite-SM Membrane.
- B. Substitutions: Under provisions of Division 01:
 - 1. Approved Equal: Submitting Manufacturers will be subject to compliance with stated requirements. Substitution request must be submitted 10 days prior to bid date. Provide products, by the manufacturer, that meet or exceed the stated manufacturers qualifications, performance requirements, fire test requirements, physical properties and warranty requirements.
 - a. Thickness: 45 mils (1.1 mm), nominal.
 - b. Color: Off White/ Thermal Tan.
 - c. Inter-ply Reinforcement to be 18 x 19 / 840 X 1,000 denier with reinforced polyester knit fabric that includes an adhesive coating that promotes a molecular bond between the base fabric and the top and bottom membrane facer films.
 - d. Maximum sheet width 6 feet (or up to 74 inches).
 - 2. Substitution request must comply with the following minimum physical properties, Substitutes will only be considered if properties are provided in the same format, as below, for comparison purposes.

a. Test Method Result		
Thickness (nominal)	ASTM D751	0.045 (1.14mm)
Breaking Strength	ASTM D751 Grab	375 x 350 lbs
Tensile Strength	ASTM D882	8500 psi (598 kgf/cm2)
Tear Strength	ASTM D751	100 lbs (445 N)
Dynamic Puncture	ASTM D5635	25 joules
Low Temperature Flex	ASTM D2136	-40 degrees F
Dimensional Stability	ASTM D1204	<1.0%
Seam Strength	ASTM D751	100% of fabric strength
Coating Adhesion	ASTM D751	Cannot initiate coating peel

Hydrostatic Resistance	ASTM D751	750 psi (46 kgf/cm ²)
Oil Resistance	MIL-C-20696C	No swelling, cracking, or leaking
Ozone Resistance	ASTM D1149	No effect
Solar Reflectance Index (SRI)	ASTM E1980	98.54

3. All Manufacturers submitting for an approved substitution must produce a membrane which contains the solid state polymer "KEE" or Elvaloy component.

2.02 AUXILIARY MATERIALS

- A. General: Auxiliary materials recommended by roofing system manufacturer for intended use and compatible with membrane roofing.
 1. Liquid-type auxiliary materials shall meet VOC limits of authorities having jurisdiction.
- B. Manufacturer's standard sheet flashing of same material, type, reinforcement, thickness, and color as KEE sheet membrane.
- C. Bonding Adhesive: Manufacturers standard solvent based bonding adhesive, for membrane and for base flashing applications.
- D. Insulation Adhesive: Manufacturers approved low rise or Two-Part Polyurethane Insulation Adhesive.
- E. Manufacturer's standard predrilled stainless-steel or aluminum bars, approximately 1 by 1/8 inch (25 by 3 mm) thick; with anchors.
- F. Fasteners: Factory-coated steel fasteners and metal plates meeting corrosion-resistance provisions in FMG 4470, designed for fastening membrane to substrate, and acceptable to membrane roofing system manufacturer.
- G. Miscellaneous Accessories: Provide pourable sealers, preformed cone and vent sheet flashings, preformed inside and outside corner sheet flashings, T-joint covers, termination reglets, cover strips, and other accessories, as required and approved by the manufacturer.
- H. FiberClad coated, heat weldable sheet metal capable of being formed into a variety of shapes and profiles. 24 gauge. G90 galvanized metal sheet with a 20 mil (0.5 mm) coating. 4 ft by 8 ft (1.2 m x 1.2 m) or 4 ft by 10 ft (1.2 m x 3.0 m).
 1. m) or 4 ft by 10 ft (1.2 m x 3.0 m).
- I. Wall Vents: 24 gauge galvanized or PVC clad steel. Net free area of 39.6 sq.in. each. Shall be shaped to keep out rain water. Shall have 1/8 inch or finer bug screen.
- J. Sump Pans: Install a prefabricated insulation sumped drain, 36 by 36 inch min. at each roof drain, overflow drain, and reinforce, per Manufacturers approved detail requirement.

2.03 VAPOR RETARDER

- A. Vapor Retarder Type 1: ASTM D4397 Clear polyethylene film for installation on roof deck and directly behind gypsum board in interior wall assemblies, 6 mil thick (concealed locations).

2.04 ROOF INSULATION

- A. General: Provide preformed roof insulation boards that comply with requirements and referenced standards, selected from manufacturer's standard sizes and of thicknesses indicated.
- B. Polyisocyanurate Board Insulation: ASTM C1289, Type II, 25 psi, felt or glass-fiber mat facer on both major surfaces. LTTR R Value of 34.0 Min.
- C. Equivalent products by following Manufacturers are acceptable:
 1. Atlas Roofing Corp. (www.atlasroofing.com).
 2. Hunter Panels. (www.hpanels.com).
 3. Substitutions: As approved by the Membrane Manufacturer and under provisions of Division 01.

- D. Provide preformed saddles, crickets, tapered edge strips, and other insulation shapes where indicated for sloping to drain. Fabricate to slopes indicated utilizing Polyisocyanurate Insulation.

2.05 INSULATION ACCESSORIES

- A. General: Roof insulation accessories recommended by insulation manufacturer for intended use and compatible with membrane roofing.
- B. Fasteners: Factory-coated steel fasteners and metal or plates meeting corrosion-resistance provisions in FMG 4470, designed for fastening roof insulation to substrate, and acceptable to roofing system manufacturer.
- C. Sump Pans: Install a prefabricated insulation sumped drain, 36 by 36 inch min. at each roof drain, overflow drain, and reinforce, per Manufacturers approved detail requirement.

2.06 COVER BOARDS

- A. See Section 09 2116 - Gypsum Board Assemblies

2.07 WALKWAYS

- A. Flexible Walkways: Install contrasting color flexible walkways, fully adhered and acceptable to the membrane roofing system manufacturer, warranted for the duration-equal to the specified system warranty.

PART 3 – EXECUTION

3.01 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with the following requirements and other conditions affecting performance of roofing system:
 - 1. Verify that roof openings and penetrations are in place and set and braced and that roof drains are securely clamped in place.
 - 2. Verify that wood blocking, curbs, and nailers are securely anchored to roof deck at penetrations, terminations and that nailers match thicknesses of insulation.
 - 3. Verify that surface plane flatness and fastening of steel roof deck comply with requirements in Division 5 Section "Steel Decking."

3.02 PREPARATION

- A. Clean substrate of dust, debris, moisture, and other substances detrimental to roofing installation according to roofing system manufacturer's written instructions. Remove sharp projections.
- B. Prevent materials from entering and clogging roof drains and conductors and from spilling or migrating onto surfaces of other construction. Remove roof-drain plugs when no work is taking place or when rain is forecast.
- C. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing system at the end of the workday or when rain is forecast. Remove and discard temporary seals before beginning work on adjoining roofing.

3.03 INSULATION INSTALLATION

- A. Coordinate installing membrane roofing system components so insulation is not exposed to precipitation or left exposed at the end of the workday.
- B. Comply with membrane roofing system manufacturer's written instructions for installing roof insulation.
- C. Install tapered insulation under area of roofing to conform to slopes indicated.
- D. Install insulation under area of roofing to achieve required LTTR R Value of 34.0 Min. Install two equal layers of insulation, with joints of each succeeding layer staggered from joints of previous layer, half lapped in each direction.
- E. Trim surface of insulation where necessary at roof drains so completed surface is flush and does not restrict flow of water.

- F. Install insulation with long joints of insulation in a continuous straight line with end joints staggered between rows, abutting edges and ends between boards. Fill gaps exceeding 1/4 inch with insulation.
 - 1. Cut and fit insulation within 1/4 inch of nailers, projections, and penetrations.
 - 2. Fasten insulation according to requirements in FMG's "Approval Guide" for specified Windstorm Resistance Classification.
 - 3. Fasten insulation to resist uplift pressure at corners, perimeter, and field of roof.
- G. Sump Pans: Install a prefabricated insulation sumped drain, 36 by 36 inch min. at each roof drain, overflow drain, and reinforce, per Manufacturers approved detail requirement.

3.04 MECHANICALLY FASTENED ROOFING MEMBRANE INSTALLATION

- A. Install roofing membrane over area to receive roofing according to roofing system manufacturer's written instructions. Unroll roofing membrane and allow relaxing before installing.
- B. Start installation of roofing membrane in presence of roofing system manufacturer's technical personnel.
- C. Accurately align roofing membranes and maintain uniform side and end laps of minimum dimensions required by manufacturer. Stagger end laps.
- D. Mechanically fasten roofing membrane securely at terminations, penetrations, and perimeter of roofing.
- E. Apply roofing membrane with side laps shingled with slope of roof deck where possible.
- F. Seams: Clean seam areas, overlap roofing membrane, and hot-air weld side and end laps of roofing membrane according to manufacturer's written instructions to ensure a watertight seam installation.
 - 1. Test lap edges with probe to verify seam weld continuity. Apply lap sealant to seal cut edges of roofing membrane.
 - 2. Verify field strength of seams a minimum of twice daily, repair seam sample areas, label with date / location and retain for manufacturers technical manager's review.
 - 3. Repair tears, voids, and lapped seams in roofing membrane that does not meet requirements.
- G. Spread sealant or mastic bed over deck drain flange at deck drains and securely seal roofing membrane in place with clamping ring.
- H. In-Splice Attachment: Secure one edge of roofing membrane using fastening plates or metal battens centered within membrane splice and mechanically fasten roofing membrane to roof deck. Field-splice seam.

3.05 BASE FLASHING INSTALLATION

- A. Install sheet flashings and preformed flashing accessories and adhere to substrates according to membrane roofing system manufacturer's written instructions.
- B. Apply solvent-based bonding adhesive to substrate and underside of sheet flashing at required rate and allow to partially dry. Do not apply bonding adhesive to seam area of flashing.
- C. Flash penetrations and field-formed inside and outside corners with sheet flashing.
- D. Clean seam areas and overlap and firmly roll sheet flashings into the adhesive. Weld side and end laps to ensure a watertight seam installation.
- E. Terminate and seal top of sheet flashings and mechanically anchor to substrate through termination bars.

3.06 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.

3.07 FIELD QUALITY CONTROL

- A. Final Roof Inspection: Arrange for roofing system manufacturer's technical personnel to inspect roofing installation on completion and submit report to Architect.
 - 1. Notify Architect or Owner 72 hours in advance of date and time of inspection.
- B. Repair or remove and replace components of membrane roofing system where test results or inspections indicate that they do not comply with specified requirements.
- C. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

3.08 PROTECTING AND CLEANING

- A. Protect membrane roofing system from damage and wear during remainder of construction period. When remaining construction will not affect or endanger roofing, inspect roofing for deterioration and damage, describing its nature and extent in a written report, with copies to Architect and Owner.
- B. Correct deficiencies in or remove membrane roofing system that does not comply with requirements, repair substrates, and repair or reinstall membrane roofing system to a condition free of damage and deterioration at time of Substantial Completion and according to warranty requirements.
- C. Clean overspray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

3.09 ROOFING INSTALLER'S WARRANTY

- A. WHEREAS of, herein called the "Roofing Installer," has performed roofing and associated work ("work") on the following project:
 - 1. Owner:
 - 2. Address:
 - 3. Building Name/Type:
 - 4. Address:
 - 5. Area of Work:
 - 6. Acceptance Date:
 - 7. Warranty Period:
 - 8. Expiration Date:
- B. AND WHEREAS Roofing Installer has contracted (either directly with Owner or indirectly as a subcontractor) to warrant said work against leaks and faulty or defective materials and workmanship for designated Warranty Period,
- C. NOW THEREFORE Roofing Installer hereby warrants, subject to terms and conditions herein set forth, that during Warranty Period he will, at his own cost and expense, make or cause to be made such repairs to or replacements of said work as are necessary to correct faulty and defective work and as are necessary to maintain said work in a watertight condition.
- D. This Warranty is made subject to the following terms and conditions:
 - 1. Specifically excluded from this Warranty are damages to work and other parts of the building, and to building contents, caused by:
 - a. lightning;
 - b. peak gust wind speed exceeding 70 mph (m/sec);
 - c. fire;
 - d. failure of roofing system substrate, including cracking, settlement, excessive deflection, deterioration, and decomposition;
 - e. faulty construction of parapet walls, copings, chimneys, skylights, vents, equipment supports, and other edge conditions and penetrations of the work;
 - f. vapor condensation on bottom of roofing; and

- g. Activity on roofing by others, including construction contractors, maintenance personnel, other persons, and animals, whether authorized or unauthorized by Owner.
 2. When work has been damaged by any of foregoing causes, Warranty shall be null and void until such damage has been repaired by Roofing Installer and until cost and expense thereof have been paid by Owner or by another responsible party so designated.
 3. Roofing Installer is responsible for damage to work covered by this Warranty but is not liable for consequential damages to building or building contents resulting from leaks or faults or defects of work.
 4. During Warranty Period, if Owner allows alteration of work by anyone other than Roofing Installer, including cutting, patching, and maintenance in connection with penetrations, attachment of other work, and positioning of anything on roof, this Warranty shall become null and void on date of said alterations, but only to the extent said alterations affect work covered by this Warranty. If Owner engages Roofing Installer to perform said alterations, Warranty shall not become null and void unless Roofing Installer, before starting said work, shall have notified Owner in writing, showing reasonable cause for claim, that said alterations would likely damage or deteriorate work, thereby reasonably justifying a limitation or termination of this Warranty.
 5. During Warranty Period, if original use of roof is changed and it becomes used for, but was not originally specified for, a promenade, work deck, spray-cooled surface, flooded basin, or other use or service more severe than originally specified, this Warranty shall become null and void on date of said change, but only to the extent said change affects work covered by this Warranty.
 6. Owner shall promptly notify Roofing Installer of observed, known, or suspected leaks, defects, or deterioration and shall afford reasonable opportunity for Roofing Installer to inspect work and to examine evidence of such leaks, defects, or deterioration.
 7. This Warranty is recognized to be the only warranty of Roofing Installer on said work and shall not operate to restrict or cut off Owner from other remedies and resources lawfully available to Owner in cases of roofing failure. Specifically, this Warranty shall not operate to relieve Roofing Installer of responsibility for performance of original work according to requirements of the Contract Documents, regardless of whether Contract was a contract directly with Owner or a subcontract with Owner's General Contractor.
- E. IN WITNESS THEREOF, this instrument has been duly executed this day of , .
1. Authorized Signature:
 2. Name:
 3. Title:

END OF SECTION 07 5400

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**SECTION 07 5419
SINGLE-PLY PVC THERMOPLASTIC ROOFING - BID ALTERNATE #2**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Mechanically attached PVC thermoplastic roofing membrane.
- B. Insulation, flat and tapered.
- C. Vapor retarder.
- D. Roofing cant strips, stack boots, roofing expansion joints, and walkway pads.

1.02 RELATED REQUIREMENTS

- A. Section 07 6200 - Sheet Metal Flashing and Trim: Counterflashings, reglets and _____.

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 C578 - Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation; 2023.
- C. ASTM C1177/C1177M - Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing; 2017.
- D. ASTM C1289 - Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board; 2023a.
- E. ASTM D4434/D4434M - Standard Specification for Poly(Vinyl Chloride) Sheet Roofing; 2021.
- F. FM DS 1-28 - Wind Design; 2015, with Editorial Revision (2024).
- G. FM DS 1-29 - Roof Deck Securement and Above-Deck Roof Components; 2016, with Editorial Revision (2022).
- H. NRCA (RM) - The NRCA Roofing Manual; 2024.

1.04 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.
- C. Shop Drawings: Indicate joint or termination detail conditions, conditions of interface with other materials, and paver layout.
- D. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- E. 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.
- F. Installer's qualification statement.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products in manufacturer's original containers, dry, undamaged, with seals and labels intact.
- B. Protect products in weather protected environment, clear of ground and moisture.
- C. Protect foam insulation from direct exposure to sunlight.

1.06 FIELD CONDITIONS

- A. Do not apply roofing membrane during unsuitable weather.

- B. Do not apply roofing membrane when ambient temperature is below 40 degrees F or above ____ degrees F.
- C. Do not apply roofing membrane to damp or frozen deck surface or when precipitation is expected or occurring.
- D. Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed the same day.

1.07 WARRANTY

- A. See Section 01 7800 - Closeout Submittals for additional warranty requirements.
- B. System Warranty: Provide manufacturer's system warranty agreeing to repair or replace roofing that leaks or is damaged due to wind or other natural causes.
 - 1. Warranty Term: 30 years.
 - 2. For repair and replacement include costs of both material and labor in warranty.
 - 3. Exceptions NOT Permitted:
 - a. Damage due to wind of speed greater than 56 mph but less than 90 mph.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Basis of Design: Carlisle SynTec: www.carlisle-syntec.com/#sle.
- B. Sika Sarnifil
- C. Substitutions: Not permitted.

2.02 ROOFING APPLICATIONS

- A. PVC Membrane Roofing: One ply membrane, mechanically fastened, over insulation.
- B. Roofing Assembly Performance Requirements and Design Criteria:
 - 1. Wind Uplift:
 - a. Designed to withstand wind uplift forces calculated with ASCE 7.
 - b. Design Wind Speed: In accordance with local building code and authorities having jurisdiction (AHJ).

2.03 ROOFING MEMBRANE AND ASSOCIATED MATERIALS

- A. Membrane:
 - 1. Material: Polyvinyl chloride (PVC) complying with ASTM D4434/D4434M.
 - 2. Reinforcing: Internal fabric.
 - 3. Thickness: 60 mils (0.060 inch), minimum.
 - 4. Sheet Width: Factory fabricated into largest sheets possible.
 - 5. Color: White.
 - 6. Products:
 - a. Carlisle SynTec Systems; SureFlex PVC.
- B. Seaming Materials: As recommended by membrane manufacturer.
- C. Membrane Fasteners: As recommended and approved by membrane manufacturer.
 - 1. Carlisle SynTec Systems; HP-X Fastener: #15 threaded fastener with #3 Phillips drive. Use with Carlisle SynTec Systems Piranha Fastening Plate for mechanically fastened membrane systems on steel or plywood decks.
- 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.
- E. Flexible Flashing Material: Same material as membrane.

2.04 DECK SHEATHING AND COVER BOARDS

- A. Deck Sheathing and Cover Board: Glass mat faced gypsum panels, ASTM C1177/C1177M, fire resistant type, 5/8 inch thick.
 - 1. Product: See Section 09 2116 Gypsum Board Assemblies

- a. See drawings for locations.
- B. Cover Board: Polyisocyanurate (ISO) thermal board, complying with ASTM C1289; Type II - Faced with dark coated-glass facer on one side and light coated-glass facer on other surface of core foam, Class 4 with thickness of 1/2 inch, and Grade 1 with 109 psi, maximum, compressive strength.
 1. Product: Carlisle SecurShield HD Polyiso.

2.05 INSULATION

- A. Expanded Polystyrene (EPS) Board Insulation: Complies with ASTM C578, and with drainage channels on one face.
 1. Tapered Board: Slope as indicated; minimum thickness 1/2 inch; fabricate of fewest layers possible.
 2. Type and Compressive Resistance: Type XI, 5 psi (35 kPa), minimum.
- B. Composite Polyisocyanurate (ISO) Board Insulation: Composite insulation panel comprised of 1/2 inch thick high-density ISO cover board laminated to ISO base insulation, complying with ASTM C1289.
 1. Base Insulation: Type II, Class 2, Grade 2, with 20 psi, minimum, compressive strength.
 2. Cover Board: Type II, Class 4, Grade 1, with 109 psi, maximum, compressive strength.
 3. Product: Carlisle SecurShield HD Composite.

2.06 ACCESSORIES

- A. 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 Rolls: Sure-Flex Heat Weldable Walkway Rolls; 80 mils (0.080 inch) thick; gray membrane.
 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; 80 mils (0.080 inch) thick, in manufacturer's standard lengths and widths.
- B. Insulation Fasteners: Appropriate for purpose intended and approved by roofing manufacturer.
- C. Membrane Adhesive: As recommended by membrane manufacturer.
 1. Products:
- D. Surface Conditioner for Adhesives: Compatible with membrane and adhesives.
- E. Sealants: As recommended by membrane manufacturer.
 1. Products:
- F. Cleaner: Manufacturer's standard, clear, solvent-based cleaner.
- G. Edgings and Terminations: Manufacturer's standard edge and termination accessories.
 1. Snap-On Edge System:
 2. Anchor Bar Fascia System:
 3. Drip Edge:
 4. Coping:
 5. PVC Coated Sheet Metal.
 6. Termination Bar.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that surfaces and site conditions are ready to receive work.
- B. Verify deck is supported and secure.
- C. Verify deck is clean and smooth, flat, free of depressions, waves, or projections, properly sloped and suitable for installation of roof system.

- D. Verify deck surfaces are dry and free of snow or ice.
- E. Verify that roof openings, curbs, and penetrations through roof are solidly set, and cant strips are in place.

3.02 INSTALLATION - GENERAL

- A. Perform work in accordance with manufacturer's instructions and NRCA (RM) applicable requirements.
- B. Do not apply roofing membrane during unsuitable weather.
- C. Do not apply roofing membrane when ambient temperature is outside the temperature range recommended by manufacturer.
- D. Do not apply roofing membrane to damp or frozen deck surface or when precipitation is expected or occurring.
- E. Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed the same day.

3.03 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.

3.04 INSULATION INSTALLATION

- A. Attachment of Insulation:
 - 1. Mechanically fasten insulation to deck in accordance with roofing manufacturer's instructions and Factory Mutual requirements.
- B. Lay subsequent layers of insulation with joints staggered minimum 6 inches from joints of preceding layer.
- C. 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.
- D. Do not apply more insulation than can be completely waterproofed in the same day.

3.05 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.
- 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 nailing strips.
- F. Coordinate installation of roof drains and sumps and related flashings.
- G. 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.

3.06 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.

3.07 CLEANING

- A. See Section 01 7000 - Execution and Closeout Requirements for additional requirements.
- B. Remove bituminous markings from finished surfaces.
- C. In areas where finished surfaces are soiled by work of this section, consult manufacturer of surfaces for cleaning advice and conform to their documented instructions.
- D. Repair or replace defaced or damaged finishes caused by work of this section.

3.08 PROTECTION

- A. Protect installed roofing and flashings from construction operations.
- B. Where traffic must continue over finished roof membrane, protect surfaces using durable materials.

END OF SECTION 07 5419

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**SECTION 07 6200
SHEET METAL FLASHING AND TRIM**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Sealants for joints within sheet metal fabrications.
- B. Precast concrete splash pads. Provide at downspouts provided by Section 07 4113

1.02 RELATED REQUIREMENTS

1.03 REFERENCE STANDARDS

- A. AAMA 2604 - Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix); 2022.
- B. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix); 2022.
- C. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2023.
- D. ASTM B209/B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2021a.
- E. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2018.
- F. ASTM D226/D226M - Standard Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing; 2017 (Reapproved 2023).
- G. ASTM D4586/D4586M - Standard Specification for Asphalt Roof Cement, Asbestos-Free; 2007 (Reapproved 2018).
- H. SMACNA (ASMM) - Architectural Sheet Metal Manual; 2012.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Shop Drawings: Indicate material profile, jointing pattern, jointing details, fastening methods, flashings, terminations, and installation details.
- C. Samples: Submit two samples, ___ by ___ inches in size, illustrating metal finish color.

1.05 QUALITY ASSURANCE

- A. Perform work in accordance with SMACNA (ASMM) requirements and standard details, except as otherwise indicated.
- B. Fabricator and Installer Qualifications: Company specializing in sheet metal work with 3 years of documented experience.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Stack material to prevent twisting, bending, and abrasion, and to provide ventilation. Slope metal sheets to ensure drainage.
- B. Prevent contact with materials that could cause discoloration or staining.

PART 2 PRODUCTS

2.01 SHEET MATERIALS

- A. Galvanized Steel: ASTM A653/A653M, with G90/Z275 zinc coating; minimum 24-gauge, 0.0239-inch thick base metal.
- B. Pre-Finished Galvanized Steel: ASTM A653/A653M, with G90/Z275 zinc coating; minimum 24-gauge, 0.0239-inch thick base metal, shop pre-coated with PVDF coating.
 - 1. Polyvinylidene Fluoride (PVDF) Coating: Superior performing organic powder coating, AAMA 2605; multiple coat, thermally cured fluoropolymer finish system.

2. Color: As selected by Architect from manufacturer's full colors.
 - a. Color Schedule (as indicated on drawings)(Note: multiple colors are in use. Plan accordingly):
 - 1) Color 7 - To be selected by architect.
 - 2) Color 8 - To be selected by architect.
- C. Pre-Finished Aluminum: ASTM B209/B209M, 3005 alloy, H12 or H14 temper; 18 gauge, 0.040 inch thick; plain finish shop pre-coated with silicone modified polyester coating.
 1. Fluoropolymer Coating: High performance organic powder coating, AAMA 2604; multiple coat, thermally cured fluoropolymer finish system.
 2. Color: As selected by Architect from manufacturer's standard colors.

2.02 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.
- E. Fabricate corners from one piece with minimum 18-inch long legs; seam for rigidity, seal with sealant.
- F. Fabricate vertical faces with bottom edge formed outward 1/4 inch and hemmed to form drip.
- G. Fabricate flashings to allow toe to extend 2 inches over roofing gravel. Return and brake edges.

2.03 GUTTERS AND DOWNSPOUTS

- A. Splash Pads: Precast concrete type, of size and profiles indicated; minimum 3,000 psi at 28 days, with minimum 5 percent air entrainment.

2.04 ACCESSORIES

- A. Fasteners: Galvanized steel, with soft neoprene washers.
- B. Underlayment: ASTM D226/D226M, organic roofing felt, Type I, No. 15.
- C. Primer Type: Zinc chromate.
- D. Concealed Sealants: Non-curing butyl sealant.
- E. Exposed Sealants: ASTM C920; elastomeric sealant, with minimum movement capability as recommended by manufacturer for substrates to be sealed; color to match adjacent material.
- F. Asphalt Roof Cement: ASTM D4586/D4586M, Type I, asbestos-free.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify roof openings, curbs, pipes, sleeves, ducts, and vents through roof are solidly set, reglets in place, and nailing strips located.
- B. Verify roofing termination and base flashings are in place, sealed, and secure.

3.02 PREPARATION

- A. Install starter and edge strips, and cleats before starting installation.
- B. Back paint concealed metal surfaces with protective backing paint to a minimum dry film thickness of 15 mil, 0.015 inch.

3.03 INSTALLATION

- A. Insert flashings into reglets to form tight fit; secure in place with lead wedges; pack remaining spaces with lead wool; seal flashings into reglets with sealant.
- B. Secure flashings in place using concealed fasteners, and use exposed fasteners only where permitted..

- C. Apply plastic cement compound between metal flashings and felt flashings.
- D. Fit flashings tight in place; make corners square, surfaces true and straight in planes, and lines accurate to profiles.
- E. Seal metal joints watertight.
- F. Secure gutters and downspouts in place with concealed fasteners.

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

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**SECTION 07 7200
ROOF ACCESSORIES**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Roof hatches.
- B. Non-penetrating pedestals.
- C. Snow guards.

1.02 RELATED REQUIREMENTS

1.03 REFERENCE STANDARDS

- A. 29 CFR 1910.23 - Ladders; Current Edition.
- B. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2023.

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.
 - 1. Preparation instructions and recommendations.
 - 2. Storage and handling requirements and recommendations.
 - 3. Installation methods.
 - 4. Maintenance requirements.
- C. Shop Drawings: Submit detailed layout developed for this project and provide dimensioned location and number for each type of roof accessory.
- D. Warranty Documentation:
 - 1. Submit manufacturer warranty.
 - 2. Ensure that forms have been completed in Owner's name and registered with manufacturer.
 - 3. Submit documentation that roof accessories are acceptable to roofing manufacturer, and do not limit the roofing warranty.

1.05 WARRANTY

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

PART 2 PRODUCTS

2.01 ROOF HATCHES AND VENTS

- A. Roof Hatch Manufacturers:
 - 1. Babcock-Davis; None - N/A: www.babcockdavis.com/#sle.
 - 2. BILCO Company; Type S: www.bilco.com/#sle.
 - 3. Dur-Red Products; None - N/A: www.dur-red.com/#sle.
 - 4. Milcor, Inc; None - N/A: www.milcorinc.com/#sle.
 - 5. Substitutions: See Section 01 6000 - Product Requirements.
- B. Roof Hatches and Smoke Vents: Factory-assembled aluminum frame and cover, complete with operating and release hardware.
 - 1. Style: Provide flat metal covers unless otherwise indicated.
 - 2. Mounting Substrate: Provide frames and curbs suitable for mounting on corrugated metal roof deck with insulation.
 - 3. Thermally Broken Hatches: Provide insulation within frame and cover.
 - 4. For Ladder Access: Single leaf; 30 by 36 inches.
- C. Frames and Curbs: One-piece curb and frame with integral cap flashing to receive roof flashings; extended bottom flange to suit mounting.
 - 1. Material: Mill finished aluminum, 11 gauge, 0.0907 inch thick.

2. Insulation: Manufacturer's standard; 1 inch rigid glass fiber, located on outside face of curb.
3. Curb Height: 12 inches from surface of roof deck, minimum.
- D. Metal Covers: Flush, insulated, hollow metal construction.
 1. Capable of supporting 40 psf live load.
 2. Material: Mill finished aluminum; outer cover 11 gauge, 0.0907 inch thick, liner 0.04 inch thick.
 3. Insulation: Manufacturer's standard 1 inch rigid glass fiber.
 4. Gasket: Neoprene, continuous around cover perimeter.
- E. Hardware: Steel, zinc coated and chromate sealed, unless otherwise indicated or required by manufacturer.
 1. Lifting Mechanisms: Compression or torsion spring operator with shock absorbers that automatically opens upon release of latch; capable of lifting covers despite 10 psf load.
 2. Hinges: Heavy duty pintle 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 and exterior.
 6. Locking: Padlock hasp on interior and exterior.
- F. Ladder Up Safety Post: Install on fixed ladders below hatch covers.
 1. Manufactures:
 - a. Bilco Company; LU-1: www.bilco.com
 - b. Substitutions: See Section 01 6000 - Product Requirements.

2.02 NON-PENETRATING ROOFTOP SUPPORTS/ASSEMBLIES

- A. Non-Penetrating Rooftop Support/Assemblies: Manufacturer-engineered and factory-fabricated, with pedestal bases that rest on top of roofing membrane, and not requiring any attachment to roof structure and not penetrating roofing assembly.
 1. Design Loadings and Configurations: As required by applicable codes.
 2. Support Spacing and Base Sizes: As required to distribute load sufficiently to prevent indentation of roofing assembly.
 3. Steel Components: Stainless steel, or carbon steel hot-dip galvanized after fabrication in accordance with ASTM A123/A123M.
 4. Hardware, Bolts, Nuts, and Washers: Stainless steel, or carbon steel hot-dip galvanized after fabrication in accordance with ASTM A153/A153M.
 5. Products:
 - a. Freedom Inc; Versablock: www.versablock.com.
 - b. Substitutions: See Section 01 6000 - Product Requirements.

2.03 SNOW GUARDS

- A. Fence Type Snow Guard: Continuous snow guard; manufacturer's standard pipe, bar, channel, or solid rod, set in brackets or posts, with optional plates and metal trim to match roof.
 1. Brackets: Zinc plated steel.
 2. Pipe or Square Tube: Mill finish.
 - a. Outside Dimensions, Square: 1 inch, nominal.
 - b. Threaded Couplings: Match pipe or tube, manufacturers standard.
 - c. End Collars and Caps: Metal to match tube.
 3. Supplemental Plates and Clips: Attached to horizontal component; match finish of pipe, tube, rod, or channel.
 4. Clamps for Standing Seam Roof: Aluminum clamps attached to standing seams of roof panels; for attachment of fence type snow guard.
 - a. Seam Profile: Selected by Architect from manufacturer's standard range; match profile of metal roof.
 - b. Finish: Mill finish.
 5. Products:
 - a. Alpine SnowGuards; www.alpinesnowguards.com.

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

PART 3 EXECUTION

3.01 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.02 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using methods recommended by manufacturer for achieving acceptable results for applicable substrate under project conditions.

3.03 INSTALLATION

- A. Install in accordance with manufacturer's instructions, in manner that maintains roofing system weather-tight integrity.

3.04 CLEANING

- A. Clean installed work to like-new condition.

3.05 PROTECTION

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

END OF SECTION 07 7200

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**SECTION 07 8100
APPLIED FIRE PROTECTION**

PART 1 GENERAL

1.01 SECTION INCLUDES

1.02 RELATED REQUIREMENTS

- A. Section 05 1200 - Structural Steel Framing.
- B. Section 05 2100 - Steel Joist Framing.
- C. Section 05 3100 - Steel Decking.

1.03 REFERENCE STANDARDS

- A. UL (FRD) - Fire Resistance Directory; Current Edition.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Coordinate with placement of ceiling hanger tabs, mechanical component hangers, and electrical components.
- B. Preinstallation Meeting: Convene one week before starting work of this section.

1.05 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittals procedures.
- B. Product Data: Provide data indicating product characteristics.
- C. Manufacturer's Certificate: Certify that applied fireproofing products meet or exceed requirements of Contract Documents.
- D. Test Reports: Reports from reputable independent testing agencies for proposed products, indicating compliance with specified criteria, conducted under conditions similar to those on project, as follows:
 - 1. Bond strength.
 - 2. Bond impact.
 - 3. Compressive strength.
 - 4. Fire tests using substrate materials similar those on project.

1.06 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years of documented experience.
- B. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years of documented experience

1.07 FIELD CONDITIONS

- A. Do not apply fireproofing when temperature of substrate material and surrounding air is below 40 degrees F or when temperature is predicted to be below said temperature for 24 hours after application.
- B. Provide ventilation in areas to receive fireproofing during application and 24 hours afterward, to dry applied material.
- C. Provide temporary enclosure to prevent spray from contaminating air.

1.08 WARRANTY

- A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
- B. Correct defective Work within a two year period after Date of Substantial Completion.
 - 1. Include coverage for fireproofing to remain free from cracking, checking, dusting, flaking, spalling, separation, and blistering.
 - 2. Reinstall or repair failures that occur within warranty period.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Applied Fire Protection:
 - 1. GCP Applied Technologies; None - N/A: www.gcpat.com/#sle.
 - 2. Isolatek International Corp; CAFCO 300: www.isolatek.com/#sle.
 - 3. Southwest Fireproofing Products Company: www.sfrm.com/#sle.
 - 4. Substitutions: See Section 01 6000 - Product Requirements.

2.02 APPLIED FIRE PROTECTION ASSEMBLIES

- A. Provide fire resistance ratings for following building elements as required by local building code:
 - 1. Roof construction, including supporting beams and joists, 2 hours.
- B. Provide fire-rated assembly ratings to UL Design Nos. as follows:
 - 1. Interior roof deck: Two hours; UL No. P719.

2.03 MATERIALS

2.04 ACCESSORIES

- A. Primer Adhesive: Of type recommended by applied fire protection manufacturer.
- B. Water: Clean, potable.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that surfaces are ready to receive fireproofing.
- B. Verify that clips, hangers, supports, sleeves, and other items required to penetrate fireproofing are in place.
- C. Verify that ducts, piping, equipment, or other items that would interfere with application of fireproofing have not been installed.
- D. Verify that voids and cracks in substrate have been filled.
- E. Verify that projections have been removed where fireproofing will be exposed to view as a finish material.

3.02 PREPARATION

- A. Perform tests as recommended by fireproofing manufacturer in applications where adhesion of fireproofing to substrate is in question.
- B. Remove incompatible materials that could effect bond by scraping, brushing, scrubbing, or sandblasting.
- C. Prepare substrates to receive fireproofing in strict accordance with instructions of fireproofing manufacturer.
- D. Apply fireproofing manufacturer's recommended bonding agent on primed steel.
- E. Protect surfaces not scheduled for fireproofing and equipment from damage by overspray, fall-out, and dusting.
- F. Close off and seal duct work in areas where fireproofing is being applied.

3.03 APPLICATION

- A. Apply primer adhesive in accordance with manufacturer's instructions.
- B. Apply fireproofing in uniform thickness and density as necessary to achieve required ratings.

3.04 FIELD QUALITY CONTROL

- A. Perform field inspection and testing in accordance with Section 01 4000 - Quality Requirements.
- B. Inspect installed fireproofing after application and curing for integrity, prior to its concealment.

- C. Ensure that actual thicknesses, densities, and bond strengths meet requirements for specified ratings and requirements of authorities having jurisdiction (AHJ).
- D. Re-inspect installed fireproofing for integrity of fire protection, after installation of subsequent Work.

3.05 CLEANING

- A. Remove excess material, overspray, droppings, and debris.
- B. Remove fireproofing from materials and surfaces not required to be fireproofed.

END OF SECTION 07 8100

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**SECTION 07 8400
FIRESTOPPING**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Firestopping systems.
- B. Firestopping of joints and penetrations in fire-resistance-rated and smoke-resistant assemblies, whether indicated on drawings or not, and other openings indicated.

1.02 RELATED REQUIREMENTS

- A. Section 01 6116 - Volatile Organic Compound (VOC) Content Restrictions.
- B. Section 01 7000 - Execution and Closeout Requirements: Cutting and patching.
- C. Section 09 2116 - Gypsum Board Assemblies: Gypsum wallboard fireproofing.

1.03 REFERENCE STANDARDS

- A. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials; 2022.
- B. ASTM E814 - Standard Test Method for Fire Tests of Penetration Firestop Systems; 2023a.
- C. ASTM E1966 - Standard Test Method for Fire-Resistive Joint Systems; 2015 (Reapproved 2019).
- D. ASTM E2307 - Standard Test Method for Determining Fire Resistance of Perimeter Fire Barriers Using Intermediate-Scale, Multi-story Test Apparatus; 2023b.
- E. ASTM E2837 - Standard Test Method for Determining the Fire Resistance of Continuity Head-of-Wall Joint Systems Installed between Rated Wall Assemblies and Nonrated Horizontal Assemblies; 2023a.
- F. ASTM G21 - Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi; 2015, with Editorial Revision (2021).
- G. ITS (DIR) - Directory of Listed Products; Current Edition.
- H. FM (AG) - FM Approval Guide; Current Edition.
- I. UL 1479 - Standard for Fire Tests of Penetration Firestops; Current Edition, Including All Revisions.
- J. UL 2079 - Standard for Tests for Fire Resistance of Building Joint Systems; Current Edition, Including All Revisions.
- K. 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 qualification statement.
- E. Installer's qualification statement.

1.05 QUALITY ASSURANCE

- A. Fire Testing: Provide firestopping assemblies of designs that provide the scheduled fire ratings when tested in accordance with methods indicated.
 - 1. Listing in UL (FRD), FM (AG), or ITS (DIR) will be considered as constituting an acceptable test report.
 - 2. Valid evaluation report published by ICC Evaluation Service, Inc. (ICC-ES) at www.icc-es.org will be considered as constituting an acceptable test report.

3. Submission of actual test reports is required for assemblies for which none of the above substantiation exists.
- B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.
- C. Installer Qualifications: Company specializing in performing the work of this section and:
 1. Verification of minimum three years documented experience installing work of this type.
 2. Verification of at least five satisfactorily completed projects of comparable size and type.

1.06 FIELD CONDITIONS

- A. Comply with firestopping manufacturer's recommendations for temperature and conditions during and after installation; maintain minimum temperature before, during, and for three days after installation of materials.
- B. Provide ventilation in areas where solvent-cured materials are being installed.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Firestopping Manufacturers:
 1. 3M Fire Protection Products; None - N/A: www.3m.com/firestop/#sle.
 2. A/D Fire Protection Systems Inc; None - N/A: www.adfire.com/#sle.
 3. Hilti, Inc; None - N/A: www.us.hilti.com/#sle.
 4. Nelson FireStop Products; None - N/A: www.nelsonfirestop.com/#sle.
 5. Specified Technologies Inc; None - N/A: www.stifirestop.com/#sle.
 6. Tremco Commercial Sealants & Waterproofing: www.tremcosealants.com/#sle.
 7. Substitutions: See Section 01 6000 - Product Requirements.

2.02 MATERIALS

- A. Firestopping Materials: Any materials meeting requirements.
- B. Mold and Mildew Resistance: Provide firestopping materials with mold and mildew resistance rating of zero(0) in accordance with ASTM G21.
- C. Primers, Sleeves, Forms, Insulation, Packing, Stuffing, and Accessories: Provide type of materials as required for tested firestopping assembly.
- D. Fire Ratings: Refer to drawings for required systems and ratings.

2.03 FIRESTOPPING ASSEMBLY REQUIREMENTS

- A. Perimeter Fire Containment Firestopping: Use system that has been tested according to ASTM E2307 to have fire resistance F Rating equal to required fire rating of floor assembly.
- B. Head-of-Wall (HW) Joint System Firestopping at Joints Between Fire-Rated Wall Assemblies and Non-Rated Horizontal Assemblies: Use system that has been tested according to ASTM E2837 to have fire resistance F Rating equal to required fire rating of wall assembly.
- C. Floor-to-Floor (FF), Floor-to-Wall (FW), Head-of-Wall (HW), and Wall-to-Wall (WW) Joints, Except Perimeter, Where Both Are Fire-Rated: Use system that has been tested according to ASTM E1966 or UL 2079 to have fire resistance F Rating equal to required fire rating of the assembly in which the joint occurs.
- D. Through Penetration Firestopping: Use system that has been tested according to ASTM E814 to have fire resistance F Rating equal to required fire rating of penetrated assembly.

2.04 FIRESTOPPING SYSTEMS

- A. Firestopping: Any material meeting requirements.
 1. Fire Ratings: Use system that is listed by FM (AG), ITS (DIR), or UL (FRD) and tested in accordance with ASTM E814, ASTM E119, or UL 1479 with F Rating equal to fire rating of penetrated assembly and minimum T Rating Equal to F Rating and in compliance with other specified requirements.
 2. Fire Ratings: See drawings for required systems and ratings.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify openings are ready to receive the work of this section.

3.02 PREPARATION

- A. Clean substrate surfaces of dirt, dust, grease, oil, loose material, or other materials that could adversely affect bond of firestopping material.
- B. Remove incompatible materials that could adversely affect bond.
- 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. Install labeling required by code.

3.04 CLEANING

- A. Clean adjacent surfaces of firestopping materials.

3.05 PROTECTION

- A. Protect adjacent surfaces from damage by material installation.

END OF SECTION 07 8400

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**SECTION 07 9200
JOINT SEALANTS**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Nonsag gunnable joint sealants.
- B. Self-leveling pourable joint sealants.
- C. Joint backings and accessories.

1.02 RELATED REQUIREMENTS

- A. Section 01 6116 - Volatile Organic Compound (VOC) Content Restrictions: Additional requirements for sealants and primers.
- B. Section 09 2116 - Gypsum Board Assemblies: Sealing acoustical and sound-rated walls and ceilings.
- C. Section 09 3000 - Tiling: Sealant between tile and plumbing fixtures and at junctions with other materials and changes in plane.

1.03 REFERENCE STANDARDS

- A. ASTM C661 - Standard Test Method for Indentation Hardness of Elastomeric-Type Sealants by Means of a Durometer; 2015 (Reapproved 2022).
- B. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2018.
- C. ASTM C1193 - Standard Guide for Use of Joint Sealants; 2016 (Reapproved 2023).
- D. ASTM C1311 - Standard Specification for Solvent Release Sealants; 2022.
- E. ASTM C1330 - Standard Specification for Cylindrical Sealant Backing for Use with Cold Liquid-Applied Sealants; 2023.
- F. ASTM D2240 - Standard Test Method for Rubber Property--Durometer Hardness; 2015 (Reapproved 2021).
- G. ASTM D412 - Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers--Tension; 2016 (Reapproved 2021).
- H. SCAQMD 1168 - Adhesive and Sealant Applications; 1989, with Amendment (2022).

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Product Data: Submit manufacturer's technical datasheets for each product to be used; include the following:
 - 1. Physical characteristics, including movement capability, VOC content, hardness, cure time, and color availability.
 - 2. List of backing materials approved for use with the specific product.
 - 3. Substrates the product should not be used on.
 - 4. Certification by manufacturer indicating that product complies with specification requirements.
- C. Color Cards for Selection: Where sealant color is not specified, submit manufacturer's color cards showing standard colors available for selection.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Nonsag Sealants:
 - 1. Dow Chemical Company; None - N/A: consumer.dow.com/en-us/industry/ind-building-construction.html/#sle.
 - 2. Pecora Corporation; None - N/A: www.pecora.com/#sle.
 - 3. Sherwin-Williams Company; None - N/A: www.sherwin-williams.com/#sle.
 - 4. Sika Corporation; None - N/A: www.usa-sika.com/#sle.

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

B. Self-Leveling Sealants:

1. Dow Chemical Company; None - N/A: consumer.dow.com/en-us/industry/ind-building-construction.html/#sle.
2. Pecora Corporation; None - N/A: www.pecora.com/#sle.
3. Sherwin-Williams Company; None - N/A: www.sherwin-williams.com/#sle.
4. Sika Corporation; None - N/A: www.usa-sika.com/#sle.
5. Substitutions: See Section 01 6000 - Product Requirements.

2.02 JOINT SEALANTS - GENERAL

A. Sealants and Primers: Provide products with acceptable levels of volatile organic compound (VOC) content; see Section 01 6116.

2.03 NONSAG JOINT SEALANTS

A. Non-Staining Silicone Sealant: ASTM C920, Grade NS, Uses M and A; not expected to withstand continuous water immersion or traffic.

1. Movement Capability: Plus and minus 25 percent, minimum.
2. Dirt Pick-Up: Reduced dirt pick-up compared to other silicone sealants.
3. Color: To be selected by Architect from manufacturer's full range.
4. Cure Type: _____.
5. Service Temperature Range: Minus 20 to 180 degrees F.
6. Products:
 - a. Dow; DOWSIL 756 SMS Building Sealant: www.dow.com/#sle.
 - b. Dow; DOWSIL 790 Silicone Building Sealant: www.dow.com/#sle.
 - c. Dow; DOWSIL 791 Silicone Weatherproofing Sealant: www.dow.com/#sle.
 - d. Dow; DOWSIL 795 Silicone Building Sealant: www.dow.com/#sle.
 - e. Sika Corporation; Sikasil WS-290: www.usa.sika.com/#sle.
 - f. Sika Corporation; Sikasil WS-295: www.usa.sika.com/#sle.
 - g. Sika Corporation; Sikasil 728NS: www.usa.sika.com/#sle.
 - h. Substitutions: See Section 01 6000 - Product Requirements.

B. Silicone Sealant: ASTM C920, Grade NS, Uses M and A; not expected to withstand continuous water immersion or traffic.

1. Movement Capability: Plus and minus 25 percent, minimum.
2. Color: To be selected by Architect from manufacturer's full range.
3. Products:
 - a. Pecora Corporation; None - N/A: www.pecora.com/#sle.
 - b. Sika Corporation; Sikasil GP: www.usa.sika.com/#sle.
 - c. Sika Corporation; Sikasil WS-295: www.usa.sika.com/#sle.
 - d. Sika Corporation; Sikasil N-Plus US: www.usa.sika.com/#sle.
 - e. Sika Corporation; Sikasil 728NS: www.usa.sika.com/#sle.
 - f. Substitutions: See Section 01 6000 - Product Requirements.

C. Polyurethane Sealant for Continuous Water Immersion: ASTM C920, Grade NS, Uses M and A; single or multi-component; explicitly approved by manufacturer for continuous water immersion; suitable for traffic exposure when recessed below traffic surface .

1. Movement Capability: Plus and minus 35 percent, minimum.
2. Color: To be selected by Architect from manufacturer's full range.
3. Products:
 - a. Sika Corporation; Sikaflex-1a: www.usa.sika.com/#sle.
 - b. Sika Corporation; Sikaflex-2c NS: www.usa.sika.com/#sle.
 - c. Substitutions: See Section 01 6000 - Product Requirements.

D. Non-Sag "Traffic-Grade" Polyurethane Sealant: ASTM C920, Grade NS, Uses M and A; single or multi-component; explicitly approved by manufacturer for continuous water immersion and traffic without the necessity to recess sealant below traffic surface.

1. Movement Capability: Plus and minus 25 percent, minimum.

2. Hardness Range: 20 to 30, Shore A, when tested in accordance with ASTM C661.
 3. Color: To be selected by Architect from manufacturer's full range.
- E. Polysulfide Sealant for Continuous Water Immersion: Polysulfide; ASTM C920, Grade NS, Uses M and A; single component; explicitly approved by manufacturer for continuous water immersion; not expected to withstand traffic.
1. Movement Capability: Plus and minus 25 percent, minimum.
 2. Hardness Range: 20 to 35, Shore A, when tested in accordance with ASTM C661.
 3. Color: To be selected by Architect from manufacturer's full range.
- F. Type ___ - Butyl Sealant: Solvent-based; ASTM C1311; single component, nonsag; not expected to withstand continuous water immersion or traffic.
1. Color: To be selected by Architect from manufacturer's full range.

2.04 SELF-LEVELING JOINT SEALANTS

- A. _____ - Flexible Polyurethane Foam: Single-component, gun grade, and low-expanding.
1. Color: White.
 2. Products:
 - a. Tremco Commercial Sealants & Waterproofing; ExoAir LEF: www.tremcosealants.com/#sle.
 - b. Substitutions: See Section 01 6000 - Product Requirements.

2.05 ACCESSORIES

- A. Overlay Extrusion for Glazing System Joint Protection: Rubber profiled extrusions placed over joints in glazing system and provided with watertight seal.
1. Profile: As required to match existing metal glazing cap requirements.
 2. Color: As required to match existing conditions.
 3. Durometer Hardness, Type A: 65, minimum, when tested in accordance with ASTM D2240.
 4. Tensile Strength: 1,139 psi, in accordance with ASTM D412.
- 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. Masking Tape: Self-adhesive, nonabsorbent, nonstaining, removable without adhesive residue, and compatible with surfaces adjacent to joints and sealants.
- D. Joint Cleaner: Noncorrosive and nonstaining type, type recommended by sealant manufacturer; compatible with joint forming materials.
- E. Primers: Type recommended by sealant manufacturer to suit application; nonstaining.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that joints are ready to receive work.
- B. Verify that backing materials are compatible with sealants.
- C. Verify that backer rods are of the correct size.

3.02 PREPARATION

- A. Remove loose materials and foreign matter that could impair adhesion of sealant.
- B. Clean joints, and prime as necessary, in accordance with manufacturer's instructions.
- C. Perform preparation in accordance with manufacturer's instructions and ASTM C1193.
- D. Mask elements and surfaces adjacent to joints from damage and disfigurement due to sealant work; be aware that sealant drips and smears may not be completely removable.

3.03 INSTALLATION

- A. Install this work in accordance with sealant manufacturer's requirements for preparation of surfaces and material installation instructions.
- B. Provide joint sealant installations complying with ASTM C1193.

- C. 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.
- D. Install bond breaker backing tape where backer rod cannot be used.
- E. Install sealant free of air pockets, foreign embedded matter, ridges, and sags, and without getting sealant on adjacent surfaces.
- F. 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.
- G. Nonsag Sealants: Tool surface concave, unless otherwise indicated; remove masking tape immediately after tooling sealant surface.
- H. See Section 01 4000 - Quality Requirements for additional requirements.

3.04 FIELD QUALITY CONTROL

- A. Perform field quality control inspection/testing as specified in PART 1 under QUALITY ASSURANCE article.
- B. Remove and replace failed portions of sealants using same materials and procedures as indicated for original installation.

3.05 POST-OCCUPANCY

- A. Post-Occupancy Inspection: Perform visual inspection of entire length of project sealant joints at a time that joints have opened to their greatest width, i.e., at low temperature in thermal cycle. Report failures immediately and repair them.

END OF SECTION 07 9200

**SECTION 08 1113
HOLLOW METAL DOORS AND FRAMES**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Non-fire-rated hollow metal doors and frames.
- B. Galvanized doors and frames at exterior locations.
- C. Hollow metal frames for wood doors.
- D. Hollow metal borrowed lites glazing frames.
- E. Accessories, including glazing and louvers.
- F. NOTE: On doors receiving exit devices no universal preps are allowed and the doors shall be prepared specifically for the exit device functions as scheduled.

1.02 RELATED REQUIREMENTS

- A. Section 08 7100 - Door Hardware.
- B. Section 09 9113 - Exterior Painting: Field painting.
- C. Section 09 9123 - Interior Painting: Field painting.

1.03 ABBREVIATIONS AND ACRONYMS

- A. ANSI: American National Standards Institute.
- B. HMMA: Hollow Metal Manufacturers Association.
- C. NFPA: National Fire Protection Association.
- D. SDI: Steel Door Institute.
- E. UL: Underwriters Laboratories.

1.04 REFERENCE STANDARDS

- A. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.
- B. ANSI/SDI A250.4 - Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors, Frames and Frame Anchors; 2022.
- C. ANSI/SDI A250.8 - Specifications for Standard Steel Doors and Frames (SDI-100); 2023.
- 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; 2023.
- F. 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; 2023, with Editorial Revision.
- G. 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; 2023.
- H. ASTM C143/C143M - Standard Test Method for Slump of Hydraulic-Cement Concrete; 2020.
- I. ASTM C476 - Standard Specification for Grout for Masonry; 2023.
- J. BHMA A156.115 - Hardware Preparation in Steel Doors and Frames; 2016.
- K. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2017.
- L. ITS (DIR) - Directory of Listed Products; Current Edition.
- M. NAAMM HMMA 830 - Hardware Selection for Hollow Metal Doors and Frames; 2002.
- N. NAAMM HMMA 831 - Hardware Locations for Hollow Metal Doors and Frames; 2011.

- O. NAAMM HMMA 840 - Guide Specifications For Receipt, Storage and Installation of Hollow Metal Doors and Frames; 2017.
- P. NFPA 80 - Standard for Fire Doors and Other Opening Protectives; 2022.
- Q. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies; 2022.
- R. UL (DIR) - Online Certifications Directory; Current Edition.
- S. UL 10C - Standard for Positive Pressure Fire Tests of Door Assemblies; Current Edition, Including All Revisions.

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.
 - 1. **NOTE:** On doors receiving exit devices no universal preps are allowed and the doors shall be prepared specifically for the exit device functions as scheduled.
- C. Shop Drawings: Details of each opening, showing elevations, glazing, frame profiles, and any indicated finish 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.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Hollow Metal Doors and Frames:
 - 1. Ceco Door, an Assa Abloy Group company; None - N/A: www.assaabloydss.com/#sle.
 - 2. Curries, an Assa Abloy Group company; None - N/A: www.assaabloydss.com/#sle.
 - 3. Fleming Door Products, an Assa Abloy Group company; None - N/A: www.assaabloydss.com/#sle.
 - 4. Republic Doors, an Allegion brand; None - N/A: www.republicdoor.com/#sle.
 - 5. Steelcraft, an Allegion brand; None - N/A: www.allegion.com/#sle.
 - 6. Substitutions: See Section 01 6000 - Product Requirements.

2.02 PERFORMANCE REQUIREMENTS

- A. Requirements for Hollow Metal Doors and Frames:
 - 1. Steel Sheet: Comply with one or more of the following requirements; galvanized steel complying with ASTM A653/A653M, cold-rolled steel complying with ASTM A1008/A1008M, or hot-rolled pickled and oiled (HRPO) steel complying with ASTM A1011/A1011M, commercial steel (CS) Type B, for each.
 - 2. Accessibility: Comply with ICC A117.1 and ADA Standards.
 - 3. Exterior Door Top Closures: Flush end closure channel, with top and door faces aligned.
 - 4. Door Edge Profile: Manufacturers standard for application indicated.
 - 5. Typical Door Face Sheets: Flush.
 - 6. Glazed Lights: Non-removable stops on non-secure side; sizes and configurations as indicated on drawings. Style: Manufacturer's standard.
 - 7. Hardware Preparations, Selections and Locations: Comply with NAAMM HMMA 830 and NAAMM HMMA 831 or BHMA A156.115 and ANSI/SDI A250.8 (SDI-100) in accordance

with specified requirements.

8. Zinc Coating for Typical Interior and/or Exterior Locations: Provide metal components zinc-coated (galvanized) and/or zinc-iron alloy-coated (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. Combined Requirements: If a particular door and frame unit is indicated to comply with more than one type of requirement, comply with the specified requirements for each type; for instance, an exterior door that is also indicated as being sound-rated must comply with the requirements specified for exterior doors and for sound-rated doors; where two requirements conflict, comply with the most stringent.

2.03 HOLLOW METAL DOORS

- A. Exterior Doors: Thermally insulated.
1. Door Core Material: Manufacturers standard core material/construction and in compliance with requirements.
 2. Door Thermal Resistance: R-Value of 4.0.
 3. Weatherstripping: Refer to Section 08 7100.
 4. Door Finish: Factory primed and field finished.
- B. Interior Doors, Non-Fire Rated:
1. Door Finish: Factory primed and field finished.
- C. Fire-Rated Doors:
1. Fire Rating: As indicated on Door Schedule, tested in accordance with UL 10C and NFPA 252 ("positive pressure fire tests").
 2. Provide units listed and labeled by UL (DIR) or ITS (DIR).
 - a. Attach fire rating label to each fire rated unit.

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: Factory primed and field finished.
- C. Exterior Door Frames: Full profile/continuously welded type.
1. Galvanizing: Components hot-dipped zinc-iron alloy-coated (galvannealed) in accordance with ASTM A653/A653M, with A60/ZF180 coating.
 2. Frame Metal Thickness: 16 gage, 0.053 inch, minimum.
 3. Weatherstripping: Separate, see Section 08 7100.
 4. At exterior CMU openings to bridge gap between CMU veneer and the core concrete of the ICF provide 8 3/4 inch wide frames.
- D. Interior Door Frames, Non-Fire Rated: Full profile/continuously welded type.
1. Frame Metal Thickness: 18 gauge, 0.042 inch, minimum.
- E. Door Frames, Fire-Rated: Full profile/continuously welded type.
1. Fire Rating: Same as door, labeled.
 2. Frame Metal Thickness: 18 gauge, 0.042 inch, minimum.
- F. Frames for Wood Doors: Comply with frame requirements in accordance with corresponding door.
- G. Borrowed Lites Glazing Frames: Construction and face dimensions to match door frames, and as indicated on drawings.
- H. Provide mortar guard boxes for hardware cut-outs in frames to be installed in masonry or to be grouted.
- I. Frames in Masonry Walls: Size to suit masonry coursing with head member 4 inches high to fill opening without cutting masonry units.

2.05 FINISHES

- A. Primer: Rust-inhibiting, complying with ANSI/SDI A250.10, door manufacturer's standard.

- B. Bituminous Coating: Cold-applied asphalt mastic, compounded for 15 mil, 0.015 inch dry film thickness (DFT) per coat; provide inert-type noncorrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities.

2.06 ACCESSORIES

- A. Louvers: Roll formed steel with overlapping frame; finish same as door components ; factory-installed.
 - 1. Style: Sightproof inverted V blade.
 - 2. Fasteners: Exposed or concealed fasteners.
- B. Glazing: As specified in Section 08 8000, factory installed.
- C. Removable Stops: Rolled steel bar, shape as indicated on drawings, mitered or butted corners; prepared for countersink style tamper proof screws.
- D. Grout for Frames: Mortar grout complying with ASTM C476 with maximum slump of 4 inches as measured in accordance with ASTM C143/C143M for hand troweling in place; plaster grout and thinner pumpable grout are prohibited.
- E. 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.
- F. Temporary Frame Spreaders: Provide for factory- or shop-assembled frames.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Verify that opening sizes and tolerances are acceptable.
- C. Verify that finished walls are in plane to ensure proper door alignment.

3.02 PREPARATION

- A. Coat inside of frames to be installed in masonry or to be grouted, with bituminous coating, prior to installation.

3.03 INSTALLATION

- A. Install doors and frames in accordance with manufacturer's instructions and related requirements of specified door and frame standards or custom guidelines indicated.
- B. 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. Install door hardware as specified in Section 08 7100.
- F. Coordinate installation of electrical connections to electrical hardware items.

3.04 ADJUSTING

- A. Adjust for smooth and balanced door movement.

3.05 SCHEDULE

- A. Refer to Door and Frame Schedule on the drawings.

END OF SECTION 08 1113

**SECTION 08 1416
FLUSH WOOD DOORS**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Flush wood doors; flush and flush glazed configuration; fire-rated and non-rated.
- B. **NOTE:** On doors receiving exit devices no universal preps are allowed and the doors shall be prepared specifically for the exit device functions as scheduled.

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. AWI (QCP) - Quality Certification Program; Current Edition.
- B. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards, 2nd Edition; 2014, with Errata (2016).
- C. AWMAC/WI (NAAWS) - North American Architectural Woodwork Standards; 2021, with Errata.
- D. NFPA 80 - Standard for Fire Doors and Other Opening Protectives; 2022.
- E. UL 10C - Standard for Positive Pressure Fire Tests of Door Assemblies; Current Edition, Including All Revisions.

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, 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).
 - 2. **NOTE:** On doors receiving exit devices no universal preps are allowed and the doors shall be prepared specifically for the exit device functions as scheduled.
- D. Samples: Submit two samples of door veneer, 6 x 6 inch in size illustrating wood grain, stain color, and sheen.
- E. Test Reports: Show compliance with specified requirements for the following:
 - 1. Fire ratings for fire doors
- F. Warranty, executed in Owner's name.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section, with not less than three years of documented experience.
 - 1. Accredited participant in the specified certification program prior to the commencement of fabrication and throughout the duration of the project.
- B. Installer Qualifications: Company specializing in performing work of the type specified in this section, with not less than three years of documented experience.
- C. Woodwork Quality Assurance Program:
 - 1. Comply with AWI (QCP) woodwork association quality assurance service/program in accordance with requirements for work specified in this section; www.awiqcp.org/#sle.
 - 2. Provide labels indicating that the installed work complies with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS) requirements for grade or grades specified.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Package, deliver and store doors in accordance with specified quality standard.
- B. Accept doors on site in manufacturer's packaging, and inspect for damage.
- C. Protect doors with resilient packaging sealed with heat shrunk plastic; do not store in damp or wet areas or areas where sunlight might bleach veneer; seal top and bottom edges with tinted sealer if stored more than one week, and break seal on site to permit ventilation.

1.07 WARRANTY

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

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Wood Veneer Faced Doors:
 - 1. Eggers Industries: www.eggersindustries.com/#sle.
 - 2. Graham Wood Doors: www.grahamdoors.com/#sle.
 - 3. Marshfield DoorSystems, Inc: www.marshfielddoors.com/#sle.
 - 4. VT Industries, Inc; www.vtindustries.com.
 - 5. Weyerhaeuser; www.weyerhauyser.com
 - 6. Substitutions: See Section 01 6000 - Product Requirements.

2.02 DOORS AND PANELS

- A. Doors: See drawings for locations and additional requirements.
 - 1. Quality Standard: Premium Grade, Extra Heavy Duty performance, in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), unless noted otherwise.
 - 2. Wood Veneer Faced Doors: 5-ply or 7-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. Wood veneer facing with factory transparent finish as indicated on drawings.

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.

2.04 DOOR FACINGS

- A. Veneer Facing for Transparent Finish: Red oak, veneer grade in accordance with quality standard indicated, plain sliced (flat cut), with book match between leaves of veneer, running match of spliced veneer leaves assembled on door or panel face; wood grain to run horizontally. Wood grain to be installed in a horizontal direction.

2.05 DOOR CONSTRUCTION

- A. Fabricate doors in accordance with door quality standard specified.
- B. Cores Constructed with stiles and rails:
- C. Glazed Openings: Non-removable stops on non-secure side; sizes and configurations as indicated on drawings.
- D. Factory machine doors for hardware other than surface-mounted hardware, in accordance with hardware requirements and dimensions.
- E. Factory fit doors for frame opening dimensions identified on shop drawings, with edge clearances in accordance with specified quality standard.

- F. Provide edge clearances in accordance with the quality standard specified.

2.06 FINISHES - WOOD VENEER DOORS

- A. Factory finish doors in accordance with approved sample.

2.07 ACCESSORIES

- A. Hollow Metal Door Frames: See Section 08 1113.
- B. Glazing: See Section 08 8000.
- C. Glazing Stops: Wood with metal clips for rated doors, butted corners; prepared for countersink style tamper proof screws.
- D. Door Hardware: See Section 08 7100.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Verify that opening sizes and tolerances are acceptable.
- C. Do not install doors in frame openings that are not plumb or are out-of-tolerance for size or alignment.

3.02 INSTALLATION

- A. Install doors in accordance with manufacturer's instructions and specified quality standard.
 - 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.

END OF SECTION 08 1416

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**SECTION 08 3100
ACCESS DOORS AND PANELS**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Ceiling-mounted access units.
- B. Wall- and ceiling-mounted access units.

1.02 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Shop Drawings: Indicate exact position of each access door and/or panel unit.

1.03 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

PART 2 PRODUCTS

2.01 ACCESS DOORS AND PANELS ASSEMBLIES

- A. Wall-Mounted Units with Return Air Grille:
 - 1. Location: As indicated on drawings.
 - 2. Panel Material: Aluminum extrusions with gypsum board inlay.
 - 3. Size: 12 by 12 inches.
 - 4. Door/Panel: Hinged, standard duty, with tool-operated spring or cam lock and no handle.
 - 5. Wall Mounting Criteria: Provide surface-mounted face frame and door surface flush with frame surface.
 - 6. Gypsum Board Mounting Criteria: Provide drywall bead frame with door surface flush with wall surface.
 - 7. Masonry Mounting Criteria: Provide surface-mounted frame with door surface flush with frame surface.
- B. Fire-Rated Wall-Mounted Units:
 - 1. Location: As indicated on drawings.
 - 2. Wall Fire-Rating: As indicated on drawings.
 - 3. Panel Material: Steel.
 - 4. Size: 12 by 12 inches.
 - 5. Door/Panel: Insulated double-surface panel, with tool-operated spring or cam lock and no handle.
- C. Ceiling-Mounted Units with Return Air Grille:
 - 1. Location: As indicated on drawings.
 - 2. Panel Material: Aluminum extrusion with gypsum board inlay.
 - 3. Size - Lay-In Grid Ceilings: To match module of ceiling grid.
 - 4. Size - Other Ceilings: 12 by 12 inches.
 - 5. Door/Panel: Hinged, standard duty, with tool-operated spring or cam lock and no handle.
- D. Fire-Rated Ceiling-Mounted Units:
 - 1. Location: As indicated on drawings.
 - 2. Ceiling Fire-Rating: As indicated on drawings.
 - 3. Panel Material: Steel.
 - 4. Size: 12 by 12 inches.
 - 5. Door/Panel: Hinged, standard duty, with tool-operated spring or cam lock and no handle.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that rough openings are correctly sized and located.

- B. Begin installation only after substrates have been properly prepared, and if the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.02 PREPARATION

- A. Clean surfaces thoroughly prior to proceeding with this work.
- B. Prepare surfaces using methods recommended by manufacturer for applicable substrates in accordance with project conditions.

3.03 INSTALLATION

- A. Install units in accordance with manufacturer's instructions.
- B. Install frames plumb and level in openings, and secure units rigidly in place.
- C. Position units to provide convenient access to concealed equipment when necessary.

END OF SECTION 08 3100

**SECTION 08 3300
ROLLING FIRE DOORS / SMOKESHIELD FIRE DOORS**

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes: Manual and electric operated, automatic closing, overhead rolling fire doors with SmokeShield □ UL leakage rated assembly label.
- B. Related Sections:
 - 1. Division 26. Electrical wiring and conduit, fuses, disconnect switches, connection of operator to power supply, installation of control station and wiring, and connection to alarm systems.
- C. Products That May Be Supplied, But Are Not Installed Under This Section:
 - 1. Control Station
 - 2. Annunciator

1.02 SYSTEM DESCRIPTION

- A. Performance Requirements:
 - 1. Provide doors with Underwriters' Laboratories, Inc. label for the fire rating classification, 1 1/2 hr.

1.03 SUBMITTALS

- A. Reference Section 01 33 00—Submittal Procedures; submit the following items:
 - 1. Product Data
 - 2. Shop Drawings: Include special conditions not detailed in Product Data. Show interface with adjacent work.
 - 3. Quality Assurance/Control Submittals:
 - a. Provide manufacturer's installation instructions.
 - 4. Closeout Submittals:
 - a. Operation and Maintenance Manual.
 - b. Certificate stating that installed materials comply with this specification.

1.04 QUALITY ASSURANCE

- A. Qualifications:
 - 1. Manufacturer Qualifications: ISO 9001:2015 registered and a minimum of five years experience in producing fire and smoke control units of the type specified.
 - 2. Installer Qualifications: Manufacturer's approval.

1.05 DELIVERY STORAGE AND HANDLING

- A. Reference Section 01 66 00—Product Storage and Handling Requirements.
- B. Follow manufacturer's instructions.

1.06 WARRANTY

- A. Standard Warranty: Two years from date of shipment against defects in material and workmanship.
- B. Maintenance: Submit for owner's consideration and acceptance of a maintenance service agreement for installed products.

PART 2 PRODUCTS

2.01 MANUFACTURER

- A. Manufacturer:
 - 1. Cornell: 24 Elmwood Avenue, Mountain Top, PA 18707. Telephone: (800) 233-8366.
 - 2. Clopay Substitutions: Not permitted.

2.02 PRODUCT INFO

- A. Model: ERD11

2.03 MATERIALS

- A. Curtain:
1. Slats: No. 5F
 - a. Galvanized Steel with Finish as Described Below: No. 5F, minimum 22 gauge, Grade 40 steel, ASTM A 653 galvanized steel zinc coating
 2. Finish [pick one]:
 - a. GalvaNex™ Coating System (Stock Colors):
 - 1) ASTM A 653 galvanized base coating treated with dual process rinsing agents in preparation for chemical bonding baked-on base coat and [gray] [tan] [white] [brown] baked-on polyester enamel finish coat
 - b. SpectraShield® Coating System (Color Selected by Architect):
 - 1) ASTM A 653 galvanized base coating treated with dual process rinsing agents in preparation for chemical bonding, gray baked-on base coat and gray baked-on polyester finish coat
 - 2) Zirconium pre-treatment followed by baked-on polyester powder coat, with [color as selected by Architect from manufacturer's standard color range] [custom color as selected by Architect]; minimum 2.5 mils (0.065 mm) cured film thickness; ASTM D-3363 pencil hardness: H or better
 - c. Atmoshield® Powder Coating System (Color Selected by Architect):
 - 1) ASTM A 653 galvanized base coating treated with dual process rinsing agents in preparation for chemical bonding, gray baked-on base coat and gray baked-on polyester finish coat
 - 2) Zirconium pre-treatment followed by baked-on polyester powder coat, with [Weathered iron] [Weathered brown] [Earth] [Weathered bronze] [Terra cotta] [Stucco] [Platinum] [Olde copper] [Rust] [Dark roast] [Weathered copper]; minimum 2.5 mils (0.065 mm) cured film thickness;
 - (a) ASTM D-3363 pencil hardness: H or better
 - (1) Custom printed graphic finish
 - 3) GalvaNex™ Coating System (Stock Color): ASTM A 653 galvanized base coating treated with dual process rinsing agents in preparation for chemical bonding baked-on base coat and [gray] [tan] [white] [brown] baked-on polyester enamel finish coat
 - (a) Graphic to be printed on slat material using Eco-solvent ink-jet UV cured ink. Printed area to be coated with a polyester based structured wear resistant clear powder coat of 2.5-3.5 mils cured film thickness. ASTM D-3363 pencil hardness: 2H or better.
 - d. Galvanized Steel (No Paint Finish): Zirconium and bonding treatment only (no paint finish)
 - e. Stainless Steel: #4 type 304 finish
 - 1) Vinyl Decal Graphics: Flat face surface of door curtain slats to include factory applied [4] [2] -color process, 2 mil thick vinyl graphic image, 3M□ or equal. Graphic image to be selected and electronically supplied by customer.
- B. Endlocks:
1. Fabricate interlocking continuous slat sections with high strength steel endlocks secured with two ¼" (6.35 mm) rivets per UL requirements.
- C. Bottom Bar:
1. Configuration:
 - a. Structural Steel Angles: 2 structural steel angles minimum 2"x2"x1/8" (50x50x3.2 mm)
 2. Finish:
 - a. Powder Coat (Stock Colors): Zirconium treatment followed by a [gray] [tan] [white] [brown] baked-on polyester powder coat; minimum 2.5 mils (0.065 mm) cured film thickness
- D. Guides:

1. Fabrication
 - a. Minimum 3/16 inch (4.76 mm) [structural steel] [stainless steel angles]. Top of inner and outer guide angles to be flared outwards to form bellmouth for smooth entry of curtain into guides. Provide removable guide stoppers to prevent over travel of curtain and bottom bar. Top 16 1/2" (419.10 mm) of coil side guide angles to be removable for ease of curtain installation and as needed for future curtain service.
 - 1) Top 16 1/2" (419.10 mm) of coil side guide angles to be removable for ease of curtain installation and as needed for future curtain service.
2. Finish:
 - a. Powder Coat (Stock Colors): Zirconium treatment followed by a [gray] [tan] [white] [brown] baked-on polyester powder coat; minimum 2.5 mils (0.065 mm) cured film thickness

2.04 COUNTERBALANCE SHAFT ASSEMBLY:

- A. Barrel: Steel pipe capable of supporting curtain load with maximum deflection of 0.03 inches per foot (2.5 mm per meter) of width
- B. Spring Balance: Oil-tempered, heat-treated steel helical torsion spring assembly designed for proper balance of door to ensure that maximum effort to operate will not exceed 25 lbs (110 N). Provide wheel for applying and adjusting spring torque.
- C. Brackets: Fabricate from minimum 1/4 inch (6.35 mm) steel plate with permanently lubricated ball or roller bearings at rotating support points to support counterbalance shaft assembly and form end closures
 1. Finish:
 - a. Powder Coat (Stock Colors): Zirconium treatment followed by a [gray] [tan] [white] [brown] baked-on polyester powder coat; minimum 2.5 mils (0.065 mm) cured film thickness
- D. Hood:
 1. Minimum 24 gauge galvanized steel with reinforced top and bottom edges.
 2. Provide minimum 1/4 inch (6.35 mm) steel intermediate support brackets
 - a. GalvaNex™ Coating System (Stock Colors):
 - 1) ASTM A 653 galvanized base coating treated with dual process rinsing agents in preparation for chemical bonding baked-on base coat and [gray] [tan] [white] [brown] baked-on polyester enamel finish coat
- E. Combination Weather/Smoke Seals:
 1. Bottom Bar:
 - a. Motor Operated Doors: Combination smoke seal/sensing edge
 2. Guides and Head: Replaceable, UL listed, brush smoke seals sealing against fascia side of curtain

2.05 OPERATION

- A. AlarmGard Advanced Tube Motor Operation:
 1. AlarmGard Series Electric Tube Motor: UL, cUL listed NEMA 1 enclosure, [115v/ 60 Hz/ single phase service] [230v/ 50 Hz/ single phase service]. Provide a totally enclosed non ventilated motor, removable without affecting the setting of limit switches; thermal overload protection, planetary gear reduction, adjustable rotary limit switch mechanism and a transformer with 24v secondary output. All internal electrical components are to be prewired to terminal blocks.
 - a. Provide a failsafe tubular motor operated fire shutter assembly requiring no ancillary or externally mounted release devices, cables, chains, pulleys, reset handles or mechanisms
 - b. Provide an internal electrical failsafe release device that requires no additional wiring, external cables or mounting locations
 - c. Provide an internal solenoid brake mechanism to hold the door at any position during normal door operation

- d. Control automatic closure speed with an internal, totally enclosed, variable rate centrifugal governor without the use of electrical pulsation, constant rate viscosity, oscillation type or other exposed governing devices
 - e. Electrically activate door system automatic closure by [notification from central alarm system] [notification from local detectors] or [power outage] [power outage exceeding 6 hours with controller mounted battery backup system].
 - f. Maintain automatic closure speed at not more than 12" (229 mm) per second.
 - g. Enable safety edge function during alarm gravity closing while power is present. Enable door to rest upon obstruction following this sequence.
 - h. Electrically reset internal failsafe release device and door operating system upon restoration of electrical power and upon clearing of the alarm signal without requiring human supervision
 - i. Provide selectable ability for the door system to automatically self-cycle to the fully open position following automatic reset without requiring human supervision
 - j. Ensure that manual resetting of spring tension, release devices, linkages or mechanical dropouts will not be required
 - k. Notify electrical contractor to mount control station(s) and supply the appropriate disconnect switch, all conduit and wiring per the door system wiring instructions
 - l. Drop test and reset door system twice by all means of activation and comply fully with NFPA 80 Section 5
- B. Control Station:
- 1. Flush mounted: "Open/Close" key switch with "Stop" push button; NEMA 1B
- C. Control Operation:
- 1. Constant pressure to close:
 - a. No sensing device required
 - b. 2-wire, electric sensing edge seal extending full width of door bottom bar. Provide a [retracting safety cord and reel] [self-coiling cable] connection to control circuit.
- D. Sensing/Smoke Seal Edge:
- 1. Provide automatic reversing control by an automatic sensing switch within neoprene or rubber astragal extending full width of door bottom bar.
- E. Electric Sensing Edge Device:
- 1. Provide only a wireless sensing edge connection to motor operator.
 - 2. Electric coiling cords or take-up reels are not allowed to connect bottom sensing edge to motor.

2.06 ACCESSORIES

- A. Locking:
- 1. None
- B. Battery Back-Up:
- 1. Model R-BBU Battery Back-Up System for AlarmGard Motor Operator:
 - a. Prevent gravity closure for a minimum of four hours due to power failure.
- C. Fire Emergency Annunciator:
- 1. ADA compliant horn/strobe fire emergency annunciator to give advanced warning that fire shutter is about to close, activating warning signal upon alarm.
- D. Operator and Full Bracket Mechanism Cover:
- 1. Provide minimum 24 gauge galvanized steel sheet metal cover to enclose exposed moving operating components at coil area of unit. Finish to match door hood

PART 3 EXECUTION

3.01 EXAMINATION

- A. Examine substrates upon which work will be installed and verify conditions are in accordance with approved shop drawings.
- B. Coordinate with responsible entity to perform corrective work on unsatisfactory substrates.

- C. Commencement of work by installer is acceptance of substrate.

3.02 INSTALLATION

- A. General: Install door and operating equipment with necessary hardware, anchors, inserts, hangers and supports.
- B. Comply with NFPA80 and NFPA 105 and follow manufacturer's installation instructions.

3.03 ADJUSTING

- A. Following completion of installation, including related work by others, lubricate, test, and adjust doors for ease of operation, free from warp, twist, or distortion.

3.04 FIELD QUALITY CONTROL

- A. Site Test: Test doors for normal operation and automatic closing. Coordinate with authorities having jurisdiction to witness test and sign Drop Test Form.

3.05 CLEANING

- A. Clean surfaces soiled by work as recommended by manufacturer.
- B. Remove surplus materials and debris from the site.

3.06 DEMONSTRATION

- A. Demonstrate proper operation, testing and reset procedures to Owner's Representative.
- B. Instruct Owner's Representative in maintenance procedures.

END OF SECTION 08 3300

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**SECTION 08 3313
COILING COUNTER DOORS**

PART 1 GENERAL

1.01 SECTION INCLUDES

1.02 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.
- C. Shop Drawings: Indicate rough and actual opening dimensions, anchorage methods, hardware locations, and installation details.
- D. Operation and Maintenance Data: Indicate modes of operation, lubrication requirements and frequency, and periodic adjustments required.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Coiling Counter Doors:
 - 1. Cornell Iron Works; www.cornelliron.com.
 - 2. Substitutions: See Section 01 6000 - Product Requirements.

2.02 COILING COUNTER DOORS

- A. Coiling Counter Doors, Non-Fire-Rated: Stainless steel slat curtain.
 - 1. Provide integral frame of same material and finish.
 - 2. Manual push up operation.

2.03 COMPONENTS

- A. Metal Curtain Construction: Interlocking, single-thickness slats.
 - 1. Slat Ends: Alternate slats fitted with end locks to act as wearing surface in guides and to prevent lateral movement.
 - 2. Curtain Bottom: Fitted with tube to provide reinforcement and positive contact in closed position.
- B. Guide Construction: Continuous, of profile to retain door in place, with mounting brackets of same metal.
- C. Hood Enclosure: Internally reinforced to maintain rigidity and shape.
- D. Lock Hardware:
 - 1. Latching Mechanism: Inside mounted, adjustable keeper, spring activated latch bar feature to keep in locked or retracted position.
 - 2. Latch Handle: As selected by Architect.
- E. Roller Shaft Counterbalance: Steel pipe and torsion steel spring system, capable of producing torque sufficient to ensure smooth operation of curtain from any position and capable of holding position at mid-travel; with adjustable spring tension; requiring 25 lb nominal force to operate.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that adjacent construction is suitable for door installation.
- B. Verify that door opening is plumb, header is level, and dimensions are correct.
- C. Notify Architect of any unacceptable conditions or varying dimensions.
- D. Commencement of installation indicates acceptance of substrate and door opening conditions.

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.

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

**SECTION 08 4313
ALUMINUM-FRAMED STOREFRONTS**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Aluminum-framed storefront, with vision glass.
- B. Aluminum doors and frames.
 - 1. **NOTE:** On doors receiving exit devices no universal preps are allowed and the doors shall be prepared specifically for the exit device functions as scheduled.
- C. Weatherstripping.

1.02 RELATED REQUIREMENTS

- A. Section 08 4229 - Automatic Entrances.
- B. Section 08 7100 - Door Hardware: Hardware items other than specified in this section.
- C. Section 08 8000 - Glazing: Glass and glazing accessories.

1.03 REFERENCE STANDARDS

- A. AAMA CW-10 - Care and Handling of Architectural Aluminum from Shop to Site; 2015.
- B. AAMA 611 - Voluntary Specification for Anodized Architectural Aluminum; 2020.
- 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. ASTM E283/E283M - Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Skylights, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen; 2019.
- F. 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).

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Coordinate with installation of other components that comprise the exterior enclosure.
- B. Preinstallation Meeting: Conduct a preinstallation meeting one week before starting work of this section; require attendance by all affected installers.

1.05 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide component dimensions, describe components within assembly, anchorage and fasteners, glass and infill, door hardware, and internal drainage details.
- C. Shop Drawings: Indicate system dimensions, framed opening requirements and tolerances, affected related work, expansion and contraction joint location and details, and field welding required.
 - 1. **NOTE:** On doors receiving exit devices no universal preps are allowed and the doors shall be prepared specifically for the exit device functions as scheduled.
- D. Samples: Submit two samples 2 by 4 inches in size illustrating finished aluminum surface, glass, glazing materials.
- E. Manufacturer's Certificate: Certify that the products supplied meet or exceed the specified requirements.

1.06 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in performing work of type specified and with at least three years of documented experience.

- B. Installer Qualifications: Company specializing in performing work of type specified and with at least three years of documented experience.
- C. Prior to ordering aluminum doors, frames and hardware, provide a mock-up of a pair of entrance doors with the scheduled hardware found in the Project Manual. Upon written approval of the mock-up by the Owner, Architect and their Consultants and after submittal review and acceptance and after the pre-installation meeting as required by this Section, aluminum doors and frames may be fabricated and hardware may be ordered.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Handle products of this section in accordance with AAMA CW-10.
- B. Protect finished aluminum surfaces with wrapping. Do not use adhesive papers or sprayed coatings that bond to aluminum when exposed to sunlight or weather.

1.08 FIELD CONDITIONS

- A. Do not install sealants when ambient temperature is less than 40 degrees F. Maintain this minimum temperature during and 48 hours after installation.

1.09 WARRANTY

- A. See Section 01 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.

PART 2 PRODUCTS

2.01 BASIS OF DESIGN -- FRAMING FOR INSULATING GLAZING

- A. Center-Set Style, Thermally-Broken:
 - 1. Basis of Design: Kawneer: Trifab VersaGlaze 451T Framing System at exterior openings; www.kawneer.com.
 - 2. Vertical Mullion Dimensions: 2 inches wide by 4-1/2 inches deep.
- B. Center-Set Style, Not Thermally-Broken:
 - 1. Basis of Design: Kawneer: Trifab VersaGlaze 451 Framing System at interior openings and interior vestibule doors; www.kawneer.com.
 - 2. Vertical Mullion Dimensions: 2 inches wide by 4-1/2 inches deep.
- C. Substitutions: See Section 01 6000 - Product Requirements.

2.02 BASIS OF DESIGN -- SWINGING DOORS

- A. Wide Stile, Single Glazing:
 - 1. Basis of Design: Kawneer: 500 Standard Entrance System at interior openings including interior vestibule doors; www.kawneer.com.
 - 2. Thickness: 1-3/4 inches.
- B. Wide Stile, Insulating Glazing, Not Thermally-Broken: typical except at doors E104A and E104B provide Thermally-Broken.
 - 1. Basis of Design: Kawneer: 500 Standard Entrance System at exterior openings for Not Thermally-Broken; Kawneer 500T Insulpour for Thermally-Broken; www.kawneer.com.
 - 2. Thickness: 1-3/4 (at Not Thermal-Broken) and 2-1/4" (at Thermal-Broken) inches.
- C. Substitutions: See Section 01 6000 - Product Requirements.
 - 1. For any product not identified as "Basis of Design", submit information as specified for substitutions.

2.03 MANUFACTURERS

- A. Aluminum-Framed Storefront and Doors:
 - 1. EFCO Corporation; _____: www.efcocorp.com/#sle.
 - 2. Kawneer North America; _____: www.kawneer.com/#sle.
 - 3. Manko Window Systems, Inc; _____: www.mankowindows.com/#sle.

4. Oldcastle BuildingEnvelope; _____: www.oldcastlebe.com/#sle.
5. Tubelite, Inc; _____: www.tubeliteinc.com/#sle.
6. YKK AP America Inc; _____: www.ykkap.com/#sle.
7. Substitutions: See Section 01 6000 - Product Requirements.

2.04 ALUMINUM-FRAMED STOREFRONT

- A. Aluminum-Framed Storefront: Factory fabricated, factory finished aluminum framing members with infill, and related flashings, anchorage and attachment devices.
 1. Finish Color: As select by architect from manufactures full range of colors.
 2. Fabrication: Joints and corners flush, hairline, and weatherproof, accurately fitted and secured; prepared to receive anchors and hardware; fasteners and attachments concealed from view; reinforced as required for imposed loads.
 3. Construction: Eliminate noises caused by wind and thermal movement, prevent vibration harmonics, and prevent "stack effect" in internal spaces.
 4. 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.
 5. Expansion/Contraction: Provide for expansion and contraction within system components caused by cycling temperature range of 170 degrees F over a 12 hour period without causing detrimental effect to system components, anchorages, and other building elements.
 6. Movement: Allow for movement between storefront and adjacent construction, without damage to components or deterioration of seals.
 7. Perimeter Clearance: Minimize space between framing members and adjacent construction while allowing expected movement.
 8. Maintain continuous air barrier and/or vapor retarder seal throughout assembly, primarily in line with inside pane of glazing and inner sheet of infill panel, and heel bead of glazing compound.
- B. Performance Requirements
 1. Wind Loads: Design and size components to withstand the specified load requirements without damage or permanent set, when tested in accordance with ASTM E330/E330M, using loads 1.5 times the design wind loads and 10 second duration of maximum load.
 - a. Member Deflection: Limit member deflection to flexure limit of glass in any direction, with full recovery of glazing materials.
 2. Air Leakage: 0.06 cfm/sq ft maximum leakage of storefront wall area when tested in accordance with ASTM E283/E283M at 1.57 psf pressure difference.

2.05 COMPONENTS

- A. Aluminum Framing Members: Tubular aluminum sections, thermally broken with interior section insulated from exterior, drainage holes and internal weep drainage system.
 1. Framing members for interior applications need not be thermally broken.
 2. Glazing Stops: Flush.
- B. Glazing: See Section 08 8000.
- C. Swing Doors: Glazed aluminum.
 1. Thickness: 1-3/4 and 2-1/4 inches inches.
 2. Top Rail: 5 inches wide.
 3. Vertical Stiles: 5 inches wide.
 4. Bottom Rail: 10 inches wide.
 5. Glazing Stops: Square.
 6. Finish: Same as storefront.

2.06 MATERIALS

- A. Extruded Aluminum: ASTM B221 (ASTM B221M).
- B. Fasteners: Stainless steel.

- C. Glazing Gaskets: Type to suit application to achieve weather, moisture, and air infiltration requirements.

2.07 FINISHES

- A. Class I Color Anodized Finish: AAMA 611 AA-M12C22A42 Integrally colored anodic coating not less than 0.7 mils thick.
- B. Color: As selected by Architect from manufacturer's full range.
- C. Touch-Up Materials: As recommended by coating manufacturer for field application.

2.08 HARDWARE

- A. Other Door Hardware: See Section 08 7100.
- B. Weatherstripping: Wool pile, continuous and replaceable; provide on all doors.
- C. Sill Sweep Strips: Resilient seal type, retracting, of neoprene; provide on all doors.
- D. Automatic Door Operators and Actuators: See Section 08 4229.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify dimensions, tolerances, and method of attachment with other work.
- B. Verify that storefront wall openings and adjoining water-resistive and/or air barrier seal materials are ready to receive work of this section.

3.02 INSTALLATION

- A. Install wall system in accordance with manufacturer's instructions.
- B. Attach to structure to permit sufficient adjustment to accommodate construction tolerances and other irregularities.
- C. Provide alignment attachments and shims to permanently fasten system to building structure.
- D. Align assembly plumb and level, free of warp or twist. Maintain assembly dimensional tolerances, aligning with adjacent work.
- E. Provide thermal isolation where components penetrate or disrupt building insulation.
- F. Install sill flashings. Turn up ends and edges; seal to adjacent work to form water tight dam.
- G. Where fasteners penetrate sill flashings, make watertight by seating and sealing fastener heads to sill flashing.
- H. Pack fibrous insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.
- I. Touch-up minor damage to factory applied finish; replace components that cannot be satisfactorily repaired.

3.03 TOLERANCES

- A. Maximum Variation from Plumb: 0.06 inch per 3 feet non-cumulative or 0.06 inch per 10 feet, whichever is less.
- B. Maximum Misalignment of Two Adjoining Members Abutting in Plane: 1/32 inch.

3.04 ADJUSTING

- A. Adjust operating hardware and sash for smooth operation.

3.05 CLEANING

- A. Remove protective material from pre-finished aluminum surfaces.
- B. Wash down surfaces with a solution of mild detergent in warm water, applied with soft, clean wiping cloths, and take care to remove dirt from corners and to wipe surfaces clean.

3.06 PROTECTION

- A. Protect installed products from damage until Date of Substantial Completion.

END OF SECTION 08 4313

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**SECTION 08 6223
TUBULAR SKYLIGHTS**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Tubular skylights, consisting of skylight dome, reflective tube, and diffuser assembly.

1.02 REFERENCE STANDARDS

- A. ASTM B209/B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2021a.
- B. ASTM D635 - Standard Test Method for Rate of Burning and/or Extent and Time of Burning of Plastics in a Horizontal Position; 2022.
- C. ASTM D2843 - Standard Test Method for Density of Smoke from the Burning or Decomposition of Plastics; 2022.
- D. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2023d.
- E. ASTM E108 - Standard Test Methods for Fire Tests of Roof Coverings; 2020a.
- F. UL 790 - Standard for Standard Test Methods for Fire Tests of Roof Coverings; Current Edition, Including All Revisions.

1.03 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Product Data: Manufacturer's data sheets for each product.
 - 1. Preparation instructions and recommendations.
 - 2. Storage and handling requirements and recommendations.
 - 3. Installation methods.
- C. Shop Drawings: Indicate configurations, dimensions, locations, fastening methods, and installation details.
- D. Test Reports: Prior to submitting shop drawings or starting fabrication, submit test report(s) by independent testing agency showing compliance with performance requirements in excess of those prescribed by specified grade.

1.04 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with not less than ten years documented experience.
- B. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years documented experience.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's unopened packaging until ready for installation.
- B. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

1.06 FIELD CONDITIONS

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

1.07 WARRANTY

- A. See Section 01 7800 - Closeout Submittals for additional warranty requirements.
- B. Manufacturer Warranty: Provide 10-year manufacturer warranty for tubular skylights. Complete forms in Owner's name and register with manufacturer.

- C. Manufacturer Warranty: Provide 3-year manufacturer warranty for electrical parts. Complete forms in Owner's name and register with manufacturer.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Solatube International, Inc; SolaMaster, Model 750 DS-C Penetrating Ceiling, 21 inch Daylighting System: www.solatube.com/#sle.
- B. Substitutions: See Section 01 6000 - Product Requirements.

2.02 TUBULAR SKYLIGHTS

- A. Tubular Skylights: Transparent roof-mounted skylight dome and curb, reflective tube, and ceiling level diffuser assembly, transferring sunlight to interior spaces.
 - 1. Fabrication and assembly of components is by single manufacturer.
 - 2. Non-Metal Parts: Flammability less than the following.
 - a. Roof-Top Components: Class B when tested in accordance with ASTM E108 or UL 790.
 - b. Smoke Developed Index: Maximum of 450, when tested in accordance with ASTM E84; or maximum rating of 75, when tested in accordance with ASTM D2843.
 - c. Combustibility - Light Transmitting Parts: Burning extent of 2.5 inches/minute or less (ICC Class CC-2), when tested in accordance with ASTM D635 in the thickness intended for use.
 - 3. Thermal Movement: Fabricate to allow for thermal movement resulting from temperature differential from minus 30 to 180 degrees F without damage to components, fasteners, or substrates.
- B. Roof Assemblies: Transparent, UV and impact resistant dome with flashing base supporting dome and top of tube.
 - 1. Glazing: Acrylic plastic, 1/8 inch minimum thickness.
 - 2. Base: One piece, seamless, leak-proof flashing functioning as base support for dome and top of tube.
 - 3. Dome Ring: Attached to top of base section; 0.090 inch nominal thickness injection molded high impact ABS; to prevent thermal bridging between base flashing and tubing and channel condensed moisture out of tubing; weather seal of medium density pile weather stripping.
- C. Reflective Tube: ASTM B209/B209M aluminum sheet, thickness between 0.015 inch and 0.020 inch.
 - 1. Interior Finish: Exposed interior surfaces of high reflectance specular finish; specular reflectance of 92, total reflectance 95 percent.
 - 2. Tube Diameter: 21 inches.
 - 3. Tube Configuration and Length: As indicated on the drawings.
- D. Diffuser Assemblies: Supporting light transmitting surface at bottom termination of tube, with compression seal to minimize condensation and bug or dirt infiltration.
 - 1. Ceiling Ring: Edge trim for ceiling opening; injection molded high impact ABS.
 - 2. Diffuser Trim: Edge and attachment trim for diffuser lens; injection molded high impact ABS.
 - 3. Diffuser Shape in Lay-In Ceiling Grid: Square, 24 by 24 inches, to fit grid; metal transition box.
 - 4. Lens: Fresnel lens design to maximize light output and diffusion.
 - 5. Lens Material: Acrylic plastic.
 - 6. Visible Light Transmission (VLT): 90 percent, minimum.
 - 7. Seal: Closed cell EPDM foam rubber.

2.03 ACCESSORIES

- A. Fasteners: Same material as metals being fastened, non-magnetic steel, non-corrosive metal of type recommended by manufacturer, or injection molded nylon.

- B. Sealant: Elastomeric, silicone or polyurethane; compatible with materials being sealed.
- C. Wire Suspension Kit: Type E, Use the wire suspension kit when additional bracing to the structure is required.
- D. Local Dimmer Control utilizing a butterfly baffle design of Spectralight Infinity reflective material to minimize shadowing when in use: Provided with dimmer switch and cable.
 - 1. Daylight Dimmer: Type D Electro-mechanically actuated daylight valve; for universal input voltages ranging between 90 and 277 V at 50 or 60 Hz; maximum current draw of 50 ma per unit; controlled by low voltage, series Type T02: circuited, 4 conductor, size 22 cable; providing daylight output between 2 and 100 percent. Provided with dimmer switch and cable.
 - 2. Switch: Type SW, Manufacturer-specific low voltage DC DP/DT switch (white) required to operate Daylight Dimmer. Note: only one switch is required per set of synchronously controlled dimmers.
 - 3. Cable: Type CA, Two conductor low voltage cable (500 foot) for multiple unit DC connection

PART 3 EXECUTION

3.01 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.02 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.03 INSTALLATION

- A. Install in accordance with manufacturer's written instructions.
- B. Set roof assembly flashing in continuous bead of sealant.
- C. Seal joints exposed to weather in accordance with sealant manufacturer's written instructions.
- D. Conduct field test for water tightness; conduct water test in presence of Architect. Correct defective work and re-test until satisfactory.

3.04 PROTECTION

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

END OF SECTION 08 6223

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**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. "Interior Aluminum Doors and Frames"
 - d. "Aluminum-Framed Entrances and Storefronts"
 - 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.
 - b. Keying meeting is required with Owner to verify all key types, keyways, and system prior to construction.
 - 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 L Series: 10 years
 - (b) 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) Exit Devices
 - (a) Von Duprin: 3 year

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
 - 2. Acceptable Manufacturers and Products:
 - a. McKinney TB series
 - b. Best FBB 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: Refer to the paragraph of continuous hinges
 - 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: Refer to the paragraph of continuous hinges
 - b. Interior: Refer to the paragraph of continuous hinges
5. Adjust hinge width for door, frame, and wall conditions to allow proper degree of opening.
6. 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.
7. 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: Refer to the paragraph of continuous hinge
 - d. Out-Swinging Interior Lockable Doors: Non-removable pins
 - e. Interior Non-lockable Doors: Non-rising pins
8. 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
 2. Acceptable Manufacturers:
 - a. Select
 - b. Roton
- 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. Per Architect/Owner's approval
- 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. Per Architect/Owner's approval
- B. Requirements:
 1. Avoid automatic flush bolts and coordinators where possible. Owner to review and approve. Provide manual flush bolts at mechanical rooms and storerooms, top bolts only.
 2. Provide 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 MORTISE LOCKS

- A. Manufacturers and Products:
 1. Scheduled Manufacturer and Product:
 - a. Schlage L9000 series
 2. Acceptable Manufacturers and Products:
 - a. Per Architect/Owner's approval
- B. Requirements:
 1. Provide mortise locks conforming to ANSI/BHMA A156.13 Series 1000, Grade 1, and UL Listed for 3-hour fire doors.
 2. Indicators: Where specified, provide indicator window measuring a minimum 2-3/5-inch x 3/5 inch with 180-degree visibility. Provide messages color-coded using ANSI Z535 Safety Red with full text and/or symbols, as scheduled, for easy visibility. When applicable allows for lock status indication on both sides of the door.
 3. Provide locks manufactured from heavy gauge steel, containing components of steel with a zinc dichromate plating for corrosion resistance.
 4. Provide lock case that is multi-function and field reversible for handing without opening case. Cylinders: Refer to "KEYING" article, herein.
 5. Provide locks with standard 2-3/4 inches (70 mm) backset with full 3/4 inch (19 mm) throw stainless steel mechanical anti-friction latchbolt. Provide deadbolt with full 1-inch (25 mm) throw, constructed of stainless steel.
 6. Provide standard ASA strikes unless extended lip strikes are necessary to protect trim. Provide electrified options as scheduled in the hardware sets. Where scheduled, provide switches and sensors integrated into the locks and latches.
 7. Provide motor based electrified locksets that comply with the following requirements:
 - a. Universal input voltage – single chassis accepts 12 or 24VDC to allow for changes in the field without changing lock chassis.
 - b. Fail Safe/Fail Secure – changing mode between electrically locked (fail safe) and electrically unlocked (fail secure) is field selectable without opening the lock case.
 - c. Low maximum current draw – maximum 0.4 amps to allow for multiple locks on a single power supply.
 - d. Low holding current – maximum 0.01 amps to produce minimal heat, eliminate "hot levers" in electrically locked applications, and to provide reliable operation in wood doors that provide minimal ventilation and air flow.
 - e. Connections – provide quick-connect Molex system standard.
 8. (KEY OVERRIDE OPTION WHEN XL13-439 IS SPECIFIED IN HARDWARE SETS)
Provide locks with a key override feature built into the chassis that allows the outside key to retract the deadbolt and/or latchbolt, overriding the inside thumbturn when it is being held in the locked position.

9. Lever Trim: Solid brass, bronze, or stainless steel, cast or forged in design specified, with wrought roses and external lever spring cages. Provide thru-bolted levers with 2-piece spindles.
 - a. Vandlgard: Prohibited.
 - b. Lever Design: Schlage 06A .

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. Per Architect/Owner's approval
- 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: Prohibited.
 - b. Lever Design: Schlage Rhodes.

2.09 DEADBOLTS

- A. Manufacturers and Products:
 1. Scheduled Manufacturer and Product:
 - a. Schlage B500 Series
 2. Acceptable Manufacturers and Products:
 - a. Per Architect/Owner's approval
- B. Requirements:
 1. Provide grade 2 deadbolt series conforming to ANSI/BHMA A156.
 2. Cylinders: Refer to "KEYING" article, herein.
 3. Provide deadbolts with standard 2-3/4 inches (70 mm) backset. Provide 2-3/8 inches (60 mm) where noted or if door or frame detail requires. Provide deadbolt with full 1-inch (25 mm) throw, constructed of steel alloy.
 4. Provide manufacturer's standard strike.
 5. Lock Status Indicator Trim: Where specified, provide escutcheon with lock status indicator window.

- a. Escutcheon height 4.125 inches, width 2.54 inches. Projection 1.32 inches on thumbturn side and 1.28 inches on cylinder side.
- b. Unlocked and Unoccupied message will display on white background, and Locked and Occupied message will display on red background.
- c. Provide snap-in serviceable window to prevent tampering. Lock must function if indicator is compromised.
- d. Indicator window to provide 180-degree visibility.

2.10 EXIT DEVICES

- A. Manufacturers and Products:
 1. Scheduled Manufacturer and Product:
 - a. Von Duprin 98 series
 2. Acceptable Manufacturers and Products:
 - a. Per Architect/Owner's approval
- 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. 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:
 - (1) Installed independently of exit device installation, and capable of functioning on door prior to device and trim installation.
 - (2) Connected to exit device at single point in steel and aluminum doors, and two points for top and bottom latches in wood doors.
 - (3) 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
 - (4) 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.
 - (5) Top and bottom latches in steel and aluminum doors and top latch in wood doors may be removed while door is hanging.

2.11 ELECTRIC STRIKES

- A. Manufacturers and Products:
 - 1. Scheduled Manufacturer and Product:
 - a. Adams Rite: 7440 Series
 - 2. Acceptable Manufacturers and Products:
 - a. Per Architect/Owner's approval
- B. Requirements:
 - 1. Provide electric strikes designed for use with type of locks shown at each opening.
 - 2. Provide electric strikes UL Listed as burglary resistant that are tested to a minimum endurance test of 1,000,000 cycles.
 - 3. Where required, provide electric strikes UL Listed for fire doors and frames.
 - 4. Provide transformers and rectifiers for each strike as required. Verify voltage with electrical contractor.

2.12 CYLINDERS

- A. Manufacturers:
 - 1. Scheduled Manufacturer and Product:
 - a. Exterior doors: Schlage primus FSIC core system
 - b. Interior doors: Schlage classic conventional cylinder
 - c. Keyed removable mullion: Schlage classic FSIC core system
 - d. Cylinder dogging on devices: Schlage classic conventional cylinder
 - e. Keyway: Schlage E and EF
 - 2. Scheduled cylinder types and keyways are for estimating purpose only. Approval from Owner is required prior to material procurement.
 - 3. Acceptable Manufacturers and Products:
 - a. No Substitute
- B. Requirements:

1. 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.
- 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 biting 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. Per Architect/Owner's approval
- B. Requirements:
 1. Provide closers with EDA-Extra Duty Arms at all locations.
 2. Provide closers to allow 180-degree swing where possible. Closers are to be mounted on the push sides of the door with EDA arms.
 3. 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.
 4. Provide door closers with fully hydraulic, full rack and pinion action with high strength cast iron cylinder, and full complement bearings at shaft.
 5. 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.
 6. Hydraulic Fluid: Fireproof, passing requirements of UL10C, and requiring no seasonal closer adjustment for temperatures ranging from 120 degrees F to -30 degrees F.
 7. 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.
 8. 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.
 9. Provide closers with solid forged steel main arms and factory assembled heavy-duty forged forearms for parallel arm closers.
 10. Pressure Relief Valve (PRV) Technology: Not permitted.
 11. 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).
 12. 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.

2.16 ELECTRO-HYDRAULIC AUTOMATIC OPERATORS

- A. Manufacturers and Products:
 - 1. Scheduled Manufacturer and Product:
 - a. LCN 4600 series
 - 2. Acceptable Manufacturers and Products:
 - a. Per Architect/Owner's approval
- 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.

2.17 DOOR TRIM

- A. Manufacturers:
 - 1. Scheduled Manufacturer:
 - a. Ives
 - 2. Acceptable Manufacturers:
 - a. Per Architect/Owner's approval
- B. Requirements:
 - 1. Provide push plates, push bars, pull plates, pulls, and hands-free reversible door pulls with diameter and length as scheduled.

2.18 PROTECTION PLATES

- A. Manufacturers:
 - 1. Scheduled Manufacturer:
 - a. Ives
 - 2. Acceptable Manufacturers:
 - a. Per Architect/Owner's approval
- 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.

2.19 OVERHEAD STOPS AND OVERHEAD STOP/HOLDERS

- A. Manufacturers:
 - 1. Scheduled Manufacturers:
 - a. Glynn-Johnson
 - 2. Acceptable Manufacturers:
 - a. Per Architect/Owner's approval
- B. Requirements:
 - 1. Provide overhead stop at any door where conditions do not allow for a wall stop or floor stop presents tripping hazard.

2.20 DOOR STOPS AND HOLDERS

- A. Manufacturers:
 - 1. Scheduled Manufacturer:
 - a. Ives
 - 2. Acceptable Manufacturers:
 - a. Per Architect/Owner's approval
- B. Provide door stops at each door leaf:
 - 1. Provide wall stops wherever possible. Provide concave type where lockset has a push button or thumbturn.
 - 2. Where wall stop cannot be used, provide overhead stop.

2.21 THRESHOLDS, SEALS, DOOR SWEEPS, AUTOMATIC DOOR BOTTOMS, AND GASKETING

- A. Manufacturers:
 - 1. Scheduled Manufacturer:
 - a. Zero International
 - 2. Acceptable Manufacturers:
 - a. Per Architect/Owner's approval
- 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.

2.22 SILENCERS

- A. Manufacturers:
 - 1. Scheduled Manufacturer:
 - a. Ives
 - 2. Acceptable Manufacturers:
 - a. Per Architect/Owner's approval
- 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.

2.23 MAGNETIC HOLDERS

- A. Manufacturers:
 - 1. Scheduled Manufacturer:
 - a. LCN

2. Acceptable Manufacturers:
 - a. Per Architect/Owner's approval
- 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.

2.24 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.
- 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:

106432 OPT0352559 VERSION 6

LEGEND:

LINK TO CATALOG CUT SHEET

~ELECTRIFIED OPENING

HARDWARE GROUP NO. 01

FOR USE ON DOOR #(S):

F110A					
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PROVIDE EACH DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER			FINISH	MFR
2	EA	CONT. HINGE	114XY EPT	<input type="checkbox"/>		628	IVE
2	EA	POWER TRANSFER	EPT10 CON	<input type="checkbox"/>	~	689	VON
1	EA	REMOVABLE MULLION	KR4954 STAB	<input type="checkbox"/>		689	VON
1	EA	ELEC PANIC HARDWARE	RX-QEL-98-DT-CON 24 VDC	<input type="checkbox"/>	~	626	VON
1	EA	ELEC PANIC HARDWARE	RX-QEL-98-NL-CON 24 VDC	<input type="checkbox"/>	~	626	VON
1	EA	FSIC RIM CYL. HOUSING	20-079	<input type="checkbox"/>		626	SCH
1	EA	FSIC MORTISE	26-094 (CAM &			626	SCH

		CYL. HOUSING	RING AS REQ'D)				
1	EA	PRIMUS CORE	20-740-XP	<input type="checkbox"/>		626	SCH
1	EA	FSIC CORE	23-030 (FOR KEYED MULLION)	<input type="checkbox"/>		626	SCH
2	EA	SURFACE CLOSER	4040XP SCUSH	<input type="checkbox"/>		689	LCN
2	EA	KICK PLATE	8400 10" X 2" LDW B-CS	<input type="checkbox"/>		630	IVE
1	EA	RAIN DRIP	142AA (AS REQ'D)	<input type="checkbox"/>		AA	ZER
1	SET	GASKETING	429 @ HEAD & JAMBS	<input type="checkbox"/>		AA	ZER
1	EA	MULLION SEAL	8780NBK PSA	<input type="checkbox"/>		BK	ZER
2	EA	DOOR SWEEP	39A	<input type="checkbox"/>		A	ZER
1	EA	THRESHOLD	655A - OR PER SILL DETAILS	<input type="checkbox"/>		A	ZER
2	EA	WIRE HARNESS (FROM DEVICE TO HINGE)	CON-XXXX (LENGTH TO SUIT) VERIFY LENGTH		~		SCH
2	EA	POWER SUPPLY WIRE HARNESS	CON-6W		~		SCH
1	EA	CREDENTIAL READER	BY DIVISION 28.		~		
2	EA	DOOR POSITION SWITCH	BY DIVISION 28.		~		
1	EA	DOOR POSITION SWITCH	BY DIVISION 28.		~		
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 TEMPORALLY RETRACTS LATCHBOLT FOR ENTRY WHEN DOOR IS LOCKED
 DOOR IS MONITORED THROUGH ACCESS CONTROL OR SECURITY SYSTEM
 DOOR IS SECURED UPON LOSS OF POWER TO THE DEVICE
 FREE EGRESS AT ALL TIMES**

HARDWARE GROUP NO. 02

FOR USE ON DOOR #(S):

C112A

PROVIDE EACH DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER			FINISH	MFR
1	EA	CONT. HINGE	114XY	<input type="checkbox"/>		628	IVE
1	EA	STOREROOM LOCK	ND80P6D RHO	<input type="checkbox"/>		626	SCH
1	EA	ELECTRIC STRIKE	7440 FSE 12/24VDC	<input type="checkbox"/>	~	630	ADA
1	EA	LOCK GUARD	LG12	<input type="checkbox"/>		630	IVE
1	EA	SURFACE CLOSER	4040XP SCUSH	<input type="checkbox"/>		689	LCN
1	EA	RAIN DRIP	142AA (AS REQ'D)	<input type="checkbox"/>		AA	ZER
1	SET	GASKETING	429 @ HEAD & JAMBS	<input type="checkbox"/>		AA	ZER
1	EA	DOOR SWEEP	39A	<input type="checkbox"/>		A	ZER
1	EA	THRESHOLD	655A - OR PER SILL DETAILS	<input type="checkbox"/>		A	ZER
1	EA	CREDENTIAL READER	BY DIVISION 28.		~		
1	EA	DOOR POSITION SWITCH	BY DIVISION 28.		~		
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 MONITORED THROUGH ACCESS CONTROL OR SECURITY SYSTEM
 DOOR IS SECURED UPON LOSS OF POWER TO THE STRIKE
 FREE EGRESS AT ALL TIMES**

HARDWARE GROUP NO. 02A

FOR USE ON DOOR #(S):

G101A	G102A				
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PROVIDE EACH DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
1	EA	CONT. HINGE	114XY	<input type="checkbox"/>	628	IVE
1	EA	STOREROOM LOCK	ND80P6D RHO	<input type="checkbox"/>	626	SCH
1	EA	LOCK GUARD	LG12	<input type="checkbox"/>	630	IVE
1	EA	SURFACE CLOSER	4040XP SCUSH	<input type="checkbox"/>	689	LCN
1	EA	RAIN DRIP	142AA (AS REQ'D)	<input type="checkbox"/>	AA	ZER
1	SET	GASKETING	429 @ HEAD & JAMBS	<input type="checkbox"/>	AA	ZER
1	EA	DOOR SWEEP	39A	<input type="checkbox"/>	A	ZER
1	EA	THRESHOLD	655A - OR PER SILL DETAILS	<input type="checkbox"/>	A	ZER

HARDWARE GROUP NO. 03

FOR USE ON DOOR #(S):

E123B					
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PROVIDE EACH DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
1	EA	CONT. HINGE	114XY	<input type="checkbox"/>	628	IVE
1	EA	EXIT X BLANK OUTSIDE	ND25D RHO	<input type="checkbox"/>	626	SCH
1	EA	LOCK GUARD	LG12	<input type="checkbox"/>	630	IVE
1	EA	SURFACE CLOSER	4040XP SCUSH	<input type="checkbox"/>	689	LCN
1	EA	RAIN DRIP	142AA (AS REQ'D)	<input type="checkbox"/>	AA	ZER
1	SET	GASKETING	429 @ HEAD & JAMBS	<input type="checkbox"/>	AA	ZER

1	EA	DOOR SWEEP	39A	<input type="checkbox"/>		A	ZER
1	EA	THRESHOLD	655A - OR PER SILL DETAILS	<input type="checkbox"/>		A	ZER
1	EA	DOOR POSITION SWITCH	BY DIVISION 28.		~		

OPERATION:

EXIT ONLY

DOOR IS MONITORED THROUGH ACCESS CONTROL OR SECURITY SYSTEM

HARDWARE GROUP NO. 04

FOR USE ON DOOR #(S):

C111	D121B				
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PROVIDE EACH DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER			FINISH	MFR
2	EA	CONT. HINGE	114XY EPT	<input type="checkbox"/>		628	IVE
2	EA	POWER TRANSFER	EPT10 CON	<input type="checkbox"/>	~	689	VON
1	EA	REMOVABLE MULLION	KR4954 STAB	<input type="checkbox"/>		689	VON
1	EA	ELEC PANIC HARDWARE	RX-QEL-98-EO-CON 24 VDC	<input type="checkbox"/>	~	626	VON
1	EA	ELEC PANIC HARDWARE	RX-QEL-98-NL-CON 24 VDC	<input type="checkbox"/>	~	626	VON
1	EA	FSIC RIM CYL. HOUSING	20-079	<input type="checkbox"/>		626	SCH
1	EA	FSIC MORTISE CYL. HOUSING	26-094 (CAM & RING AS REQ'D)			626	SCH
1	EA	PRIMUS CORE	20-740-XP	<input type="checkbox"/>		626	SCH
1	EA	FSIC CORE	23-030 (FOR KEYED MULLION)	<input type="checkbox"/>		626	SCH
2	EA	SURFACE CLOSER	4040XP SCUSH	<input type="checkbox"/>		689	LCN
2	EA	KICK PLATE	8400 10" X 2" LDW B-	<input type="checkbox"/>		630	IVE

			CS				
1	EA	RAIN DRIP	142AA (AS REQ'D)	<input type="checkbox"/>		AA	ZER
1	SET	GASKETING	429 @ HEAD & JAMBS	<input type="checkbox"/>		AA	ZER
1	EA	MULLION SEAL	8780NBK PSA	<input type="checkbox"/>		BK	ZER
2	EA	DOOR SWEEP	39A	<input type="checkbox"/>		A	ZER
1	EA	THRESHOLD	655A - OR PER SILL DETAILS	<input type="checkbox"/>		A	ZER
2	EA	WIRE HARNESS (FROM DEVICE TO HINGE)	CON- XXXP (LENGTH TO SUIT) VERIFY LENGTH		~		SCH
2	EA	POWER SUPPLY WIRE HARNESS	CON-6W		~		SCH
1	EA	CREDENTIAL READER	BY DIVISION 28.		~		
2	EA	DOOR POSITION SWITCH	BY DIVISION 28.		~		
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 MONITORED THROUGH ACCESS CONTROL OR SECURITY SYSTEM

DOOR IS SECURED UPON LOSS OF POWER TO THE DEVICE

FREE EGRESS AT ALL TIMES

HARDWARE GROUP NO. 05

FOR USE ON DOOR #(S):

D127C					
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PROVIDE EACH DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
1	EA	CONT. HINGE	114XY	<input type="checkbox"/>	628	IVE

1	EA	STOREROOM LOCK	ND80P6D RHO	<input type="checkbox"/>		626	SCH
1	EA	ELECTRIC STRIKE	7440 FSE 12/24VDC	<input type="checkbox"/>	~	630	ADA
1	EA	LOCK GUARD	LG14	<input type="checkbox"/>		630	IVE
1	EA	SURFACE CLOSER	4040XP EDA	<input type="checkbox"/>		689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	<input type="checkbox"/>		630	IVE
1	EA	FLOOR STOP	FS18S	<input type="checkbox"/>		BLK	IVE
1	EA	RAIN DRIP	142AA (AS REQ'D)	<input type="checkbox"/>		AA	ZER
1	SET	GASKETING	429 @ HEAD & JAMBS	<input type="checkbox"/>		AA	ZER
1	EA	DOOR SWEEP	39A	<input type="checkbox"/>		A	ZER
1	EA	THRESHOLD	655A - OR PER SILL DETAILS	<input type="checkbox"/>		A	ZER
1	EA	CREDENTIAL READER	BY DIVISION 28.		~		
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. 06

FOR USE ON DOOR #(S):

B120	B122	B220	B222	C117	C220
C223					

PROVIDE EACH DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER			FINISH	MFR
1	EA	CONT. HINGE	114XY	<input type="checkbox"/>		628	IVE
1	EA	CONT. HINGE	114XY EPT	<input type="checkbox"/>		628	IVE
1	EA	POWER TRANSFER	EPT10 CON	<input type="checkbox"/>	~	689	VON
1	EA	FIRE EXIT HARDWARE	9849-EO-F-4'-LBL	<input type="checkbox"/>		626	VON
1	EA	ELEC FIRE	9849-L-	<input type="checkbox"/>	~	626	VON

		EXIT HARDWARE	F-4'- M996-06- FS- LBLAFL				
1	EA	RIM CYLINDER	20-022	<input type="checkbox"/>		626	SCH
2	EA	SURFACE CLOSER	4040XP EDA	<input type="checkbox"/>		689	LCN
2	EA	400LB WALL MAG	2510 LPB		~	630	ABH
1	EA	GASKETING	188SBK PSA (HEADER & JAMBS)	<input type="checkbox"/>		BK	ZER
2	SET	MEETING STILE	328AA-S	<input type="checkbox"/>		AA	ZER
1	EA	WIRE HARNESS (FROM DEVICE TO HINGE)	CON- XXXXP (LENGTH TO SUIT) VERIFY LENGTH		~		SCH
1	EA	POWER SUPPLY WIRE HARNESS	CON-6W		~		SCH
1	EA	CREDENTIAL READER	BY DIVISION 28.		~		
1	EA	KEY SWITCH	BY DIVISION 28.		~		
1	EA	LOW VOLTAGE POWER	BY LOW VOLTAGE.		~		

CONNECT MAGNETIC DOOR HOLDER TO FIRE ALARM SYSTEM

OPERATION:

**DOOR IS NORMALLY HELD OPEN WITH MAGNETIC DOOR HOLDER
PRESENTING VALID CREDENTIAL TEMPORARILY RELEASES LEVER FOR ENTRY WHEN DOOR
IS LOCKED**

**KEY SWITCH TURNS ON/OFF POWER TO THE 400LBS MAG HOLDER
DOOR IS LATCHED AND UNSECURED UPON LOSS OF POWER TO THE MAG HOLDER
FREE EGRESS AT ALL TIMES**

HARDWARE GROUP NO. 07

FOR USE ON DOOR #(S):

C106					
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PROVIDE EACH DOOR(S) WITH THE FOLLOWING:

QTY	DESCRIPTION	CATALOG NUMBER	FINISH	MFR
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2	EA	CONT. HINGE	114XY	<input type="checkbox"/>		628	IVE
1	EA	PANIC HARDWARE	LD-9849- EO-LBL	<input type="checkbox"/>		626	VON
1	EA	PANIC HARDWARE	LD-9849- L-06-LBL	<input type="checkbox"/>		626	VON
1	EA	RIM CYLINDER	20-022	<input type="checkbox"/>		626	SCH
2	EA	SURFACE CLOSER	4040XP EDA	<input type="checkbox"/>		689	LCN
2	EA	400LB WALL MAG	2510 LPB		~	630	ABH
2	EA	SILENCER	SR64	<input type="checkbox"/>		GRY	IVE
1	EA	KEY SWITCH	BY DIVISION 28.		~		

VERIFY FIRE RATING AND HARDWARE FUNCTION AT #C106

OPERATION:

DOOR MAY BE HELD OPEN WITH MAGNETIC DOOR HOLDER

KEY SWITCH TURNS ON/OFF POWER TO THE MAG HOLDER

HARDWARE GROUP NO. 08

FOR USE ON DOOR #(S):

B107							
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PROVIDE EACH DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER			FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5 NRP	<input type="checkbox"/>		652	IVE
1	EA	STOREROOM LOCK	ND80P6D RHO	<input type="checkbox"/>		626	SCH
1	EA	ELECTRIC STRIKE	7440 FSE 12/24VDC	<input type="checkbox"/>	~	630	ADA
1	EA	SURFACE CLOSER	4040XP HEDA	<input type="checkbox"/>		689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	<input type="checkbox"/>		630	IVE
1	EA	WALL STOP	WS401/402CVX	<input type="checkbox"/>		626	IVE
3	EA	SILENCER	SR64	<input type="checkbox"/>		GRY	IVE
1	EA	CREDENTIAL READER	BY DIVISION 28.		~		
1	EA	LOW VOLTAGE POWER	BY LOW VOLTAGE.		~		

DOOR MAY BE HELD OPEN WITH CLOSER ARM

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. 08A

FOR USE ON DOOR #(S):

B108A

PROVIDE EACH DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER			FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5 NRP	<input type="checkbox"/>		652	IVE
1	EA	STOREROOM LOCK	ND80P6D RHO	<input type="checkbox"/>		626	SCH
1	EA	ELECTRIC STRIKE	7440 FSE 12/24VDC	<input type="checkbox"/>	~	630	ADA
1	EA	SURFACE CLOSER	4040XP EDA	<input type="checkbox"/>		689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	<input type="checkbox"/>		630	IVE
1	EA	WALL STOP	WS401/402CVX	<input type="checkbox"/>		626	IVE
1	EA	GASKETING	188SBK PSA (HEADER & JAMBS)	<input type="checkbox"/>		BK	ZER
1	EA	CREDENTIAL READER	BY DIVISION 28.		~		
1	EA	LOW VOLTAGE POWER	BY LOW VOLTAGE.		~		

COORDINATE WITH WOOD DOOR MANUFACTURER TO PROVIDE FIRE DOOR WITH INTUMESCENT SEAL PER CODE

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. 09

FOR USE ON DOOR #(S):

E121

PROVIDE EACH DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER			FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5 NRP	<input type="checkbox"/>		652	IVE
1	EA	STOREROOM LOCK	ND80P6D RHO	<input type="checkbox"/>		626	SCH

1	EA	ELECTRIC STRIKE	7440 FSE 12/24VDC	<input type="checkbox"/>	~	630	ADA
1	EA	LOCK GUARD	LG14	<input type="checkbox"/>		630	IVE
1	EA	SURFACE CLOSER	4040XP HEDA	<input type="checkbox"/>		689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	<input type="checkbox"/>		630	IVE
1	EA	WALL STOP	WS401/402CVX	<input type="checkbox"/>		626	IVE
3	EA	SILENCER	SR64	<input type="checkbox"/>		GRY	IVE
1	EA	CREDENTIAL READER	BY DIVISION 28.		~		
1	EA	LOW VOLTAGE POWER	BY LOW VOLTAGE.		~		

DOOR MAY BE HELD OPEN WITH CLOSER ARM

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. 10

FOR USE ON DOOR #(S):

B109							
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PROVIDE EACH DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER			FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	<input type="checkbox"/>		652	IVE
1	EA	STOREROOM LOCK	ND80P6D RHO	<input type="checkbox"/>		626	SCH
1	EA	ELECTRIC STRIKE	7440 FSE 12/24VDC	<input type="checkbox"/>	~	630	ADA
1	EA	SURFACE CLOSER	4040XP HEDA	<input type="checkbox"/>		689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	<input type="checkbox"/>		630	IVE
1	EA	WALL STOP	WS401/402CVX	<input type="checkbox"/>		626	IVE
3	EA	SILENCER	SR64	<input type="checkbox"/>		GRY	IVE
1	EA	CREDENTIAL READER	BY DIVISION 28.		~		
1	EA	LOW VOLTAGE POWER	BY LOW VOLTAGE.		~		

DOOR MAY BE HELD OPEN WITH CLOSER ARM

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. 10A

FOR USE ON DOOR #(S):

B209					
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PROVIDE EACH DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	<input type="checkbox"/>	652	IVE
1	EA	ENTRANCE LOCK	ND53P6D RHO	<input type="checkbox"/>	626	SCH
1	EA	SURFACE CLOSER	4040XP HEDA	<input type="checkbox"/>	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	<input type="checkbox"/>	630	IVE
1	EA	WALL STOP	WS401/402CVX	<input type="checkbox"/>	626	IVE
3	EA	SILENCER	SR64	<input type="checkbox"/>	GRY	IVE
1	EA	CREDENTIAL READER	BY DIVISION 28.		~	
1	EA	LOW VOLTAGE POWER	BY LOW VOLTAGE.		~	

DOOR MAY BE HELD OPEN WITH CLOSER ARM

HARDWARE GROUP NO. 11

FOR USE ON DOOR #(S):

A101	A102	A103	A105	A106	A107
A108	A111	A112	A113	A114	A116A
A116B	A201	A202	A203	A205	A206
A207	A208	A211	A213	A214	A216A
A216B	B101	B104	B105	B106	B121A
B121B	B126A	B126B	B201	B204	B205
B206	B207	B208	B221A	B221B	B226A
B226B	C101	C103	C201	C203	C204
C210	C211	C213	C218	C219	C222
C224	F111				

PROVIDE EACH DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5 NRP	<input type="checkbox"/>	652	IVE
1	EA	CLASSROOM SECURITY	ND78P6D RHO IS-CRS	<input type="checkbox"/>	626	SCH
1	EA	KICK PLATE	8400 10" X 2"	<input type="checkbox"/>	630	IVE

1	EA	WALL STOP	LDW B-CS WS401/402CVX	<input type="checkbox"/>	626	IVE
1	EA	GASKETING	188SBK PSA (HEADER & JAMBS)	<input type="checkbox"/>	BK	ZER

HARDWARE GROUP NO. 12

FOR USE ON DOOR #(S):

C216	F110B					
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PROVIDE EACH DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5	<input type="checkbox"/>	652	IVE
1	EA	CLASSROOM SECURITY	ND78P6D RHO IS-CRS	<input type="checkbox"/>	626	SCH
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	<input type="checkbox"/>	630	IVE
1	EA	WALL STOP	WS401/402CVX	<input type="checkbox"/>	626	IVE
1	EA	GASKETING	188SBK PSA (HEADER & JAMBS)	<input type="checkbox"/>	BK	ZER

HARDWARE GROUP NO. 13

FOR USE ON DOOR #(S):

E125A						
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PROVIDE EACH DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5 NRP	<input type="checkbox"/>	652	IVE
1	EA	PANIC HARDWARE - CLASSROOM SECURITY W/INDICATOR	LD-98-L-2SI-06	<input type="checkbox"/>	626	VON
1	EA	RIM CYLINDER	20-021 (FOR INSIDE CYLINDER)	<input type="checkbox"/>	626	SCH
1	EA	RIM CYLINDER	20-022	<input type="checkbox"/>	626	SCH
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	<input type="checkbox"/>	630	IVE
1	EA	WALL STOP	WS401/402CVX	<input type="checkbox"/>	626	IVE
1	EA	GASKETING	188SBK PSA (HEADER & JAMBS)	<input type="checkbox"/>	BK	ZER

HARDWARE GROUP NO. 15

FOR USE ON DOOR #(S):

D111B	D119B				
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PROVIDE EACH DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
1	EA	CONT. HINGE	114XY	<input type="checkbox"/>	628	IVE
1	EA	FIRE EXIT HARDWARE	98-L-F-4'-2SI-06-SNB	<input type="checkbox"/>	626	VON
1	EA	RIM CYLINDER	20-021 (FOR INSIDE CYLINDER)	<input type="checkbox"/>	626	SCH
1	EA	RIM CYLINDER	20-022	<input type="checkbox"/>	626	SCH
1	EA	SURFACE CLOSER	4040XP EDA	<input type="checkbox"/>	689	LCN
1	EA	DROP PLATE	PROVIDE AS NECESSARY		689	
1	EA	WALL STOP	WS401/402CVX	<input type="checkbox"/>	626	IVE
1	EA	GASKETING	188SBK PSA (HEADER & JAMBS)	<input type="checkbox"/>	BK	ZER

COORDINATE WITH WOOD DOOR MANUFACTURER TO PROVIDE FIRE DOOR WITH INTUMESCENT SEAL PER CODE

HARDWARE GROUP NO. 16

FOR USE ON DOOR #(S):

D108B	D111C				
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PROVIDE EACH DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
1	EA	CONT. HINGE	114XY	<input type="checkbox"/>	628	IVE
1	EA	CLASSROOM SECURITY	ND78P6D RHO IS-CRS	<input type="checkbox"/>	626	SCH
1	EA	SURFACE CLOSER	4040XP EDA	<input type="checkbox"/>	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	<input type="checkbox"/>	630	IVE
1	EA	MAGNETIC DOOR HOLDER	SEM7850 12V/24V/120V	<input type="checkbox"/>	~	689 LCN
1	EA	GASKETING	188SBK PSA (HEADER & JAMBS)	<input type="checkbox"/>	BK	ZER

**CONNECT MAGNETIC DOOR HOLDER TO FIRE ALARM SYSTEM
COORDINATE WITH WOOD DOOR MANUFACTURER TO PROVIDE FIRE DOOR WITH
INTUMESCENT SEAL PER CODE**

HARDWARE GROUP NO. 17

FOR USE ON DOOR #(S):

E125B					
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PROVIDE EACH DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5 NRP	<input type="checkbox"/>	630	IVE
1	EA	PANIC HARDWARE	LD-98-EO	<input type="checkbox"/>	626	VON
1	EA	SURFACE CLOSER	4040XP SCUSH	<input type="checkbox"/>	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B- CS	<input type="checkbox"/>	630	IVE
1	EA	RAIN DRIP	142AA (AS REQ'D)	<input type="checkbox"/>	AA	ZER
1	SET	GASKETING	429 @ HEAD & JAMBS	<input type="checkbox"/>	AA	ZER
1	EA	DOOR SWEEP	39A	<input type="checkbox"/>	A	ZER
1	EA	THRESHOLD	655A - OR PER SILL DETAILS	<input type="checkbox"/>	A	ZER
1	EA	DOOR POSITION SWITCH	BY DIVISION 28.	~		

EXIT ONLY

HARDWARE GROUP NO. 18

FOR USE ON DOOR #(S):

C116C	D108A	D111A	D119A		
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PROVIDE EACH DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
2	EA	CONT. HINGE	114XY	<input type="checkbox"/>	628	IVE
1	EA	PANIC HARDWARE	CDSI-9850WDC- L-DT-06-LBL- SNB	<input type="checkbox"/>	626	VON
1	EA	PANIC HARDWARE	CDSI-9850WDC- L-NL-06-LBL- SNB	<input type="checkbox"/>	626	VON

2	EA	MORTISE CYLINDER	20-002 X XQ11-949		626	SCH
1	EA	RIM CYLINDER	20-022	<input type="checkbox"/>	626	SCH
2	EA	SURFACE CLOSER	4040XP HEDA	<input type="checkbox"/>	689	LCN
2	EA	KICK PLATE	8400 10" X 2" LDW B-CS	<input type="checkbox"/>	630	IVE
2	EA	WALL STOP	WS401/402CVX	<input type="checkbox"/>	626	IVE
1	EA	GASKETING	188SBK PSA (HEADER & JAMBS)	<input type="checkbox"/>	BK	ZER
1	EA	MEETING STILE	8217SBK PSA	<input type="checkbox"/>	BK	ZER

**DOOR MAY BE HELD OPEN WITH CLOSER ARM
HARDWARE GROUP NO. 18A**

FOR USE ON DOOR #(S):

F104B						
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PROVIDE EACH DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
2	EA	CONT. HINGE	114XY	<input type="checkbox"/>	628	IVE
1	EA	PANIC HARDWARE	CDSI-9849-DT-LBL	<input type="checkbox"/>	626	VON
1	EA	PANIC HARDWARE	CDSI-9849-NL-LBL	<input type="checkbox"/>	626	VON
2	EA	MORTISE CYLINDER	20-002 X XQ11-949		626	SCH
1	EA	RIM CYLINDER	20-022	<input type="checkbox"/>	626	SCH
2	EA	SURFACE CLOSER	4040XP HEDA	<input type="checkbox"/>	689	LCN
2	EA	KICK PLATE	8400 10" X 2" LDW B-CS	<input type="checkbox"/>	630	IVE
2	EA	WALL STOP	WS401/402CVX	<input type="checkbox"/>	626	IVE
1	EA	GASKETING	188SBK PSA (HEADER & JAMBS)	<input type="checkbox"/>	BK	ZER

**DOOR MAY BE HELD OPEN WITH CLOSER ARM
HARDWARE GROUP NO. 19**

FOR USE ON DOOR #(S):

F104A						
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PROVIDE EACH DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
2	EA	CONT. HINGE	114XY	<input type="checkbox"/>	628	IVE
2	EA	PANIC	CDSI-9849-DT-	<input type="checkbox"/>	626	VON

		HARDWARE	LBL				
2	EA	MORTISE CYLINDER	20-002 X XQ11-949			626	SCH
2	EA	SURFACE CLOSER	4040XP HEDA	<input type="checkbox"/>		689	LCN
2	EA	KICK PLATE	8400 10" X 2" LDW B-CS	<input type="checkbox"/>		630	IVE
2	EA	WALL STOP	WS401/402CVX	<input type="checkbox"/>		626	IVE
1	EA	GASKETING	188SBK PSA (HEADER & JAMBS)	<input type="checkbox"/>		BK	ZER

**DOOR MAY BE HELD OPEN WITH CLOSER ARM
DOOR MAY BE DOGGED WITH MECHANICAL KEY
HARDWARE GROUP NO. 20**

FOR USE ON DOOR #(S):

D101F	D121A				
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PROVIDE EACH DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER			FINISH	MFR
2	EA	CONT. HINGE	114XY	<input type="checkbox"/>		628	IVE
1	EA	PANIC HARDWARE	CDSI-9850WDC-DT-LBL-SNB	<input type="checkbox"/>		626	VON
1	EA	PANIC HARDWARE	CDSI-9850WDC-NL-LBL-SNB	<input type="checkbox"/>		626	VON
2	EA	MORTISE CYLINDER	20-002 X XQ11-949			626	SCH
1	EA	RIM CYLINDER	20-022	<input type="checkbox"/>		626	SCH
2	EA	SURFACE CLOSER	4040XP HEDA	<input type="checkbox"/>		689	LCN
2	EA	WALL STOP	WS401/402CVX	<input type="checkbox"/>		626	IVE
1	EA	GASKETING	188SBK PSA (HEADER & JAMBS)	<input type="checkbox"/>		BK	ZER

**DOOR MAY BE HELD OPEN WITH CLOSER ARM
HARDWARE GROUP NO. 22**

FOR USE ON DOOR #(S):

F104E					
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PROVIDE EACH DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER			FINISH	MFR
2	EA	CONT. HINGE	114XY	<input type="checkbox"/>		628	IVE
1	EA	PANIC HARDWARE	CDSI-9850WDC-DT-LBL-SNB	<input type="checkbox"/>		626	VON
1	EA	PANIC HARDWARE	CDSI-9850WDC-NL-LBL-SNB	<input type="checkbox"/>		626	VON
2	EA	MORTISE	20-002 X			626	SCH

		CYLINDER	XQ11-949				
1	EA	RIM CYLINDER	20-022	<input type="checkbox"/>		626	SCH
2	EA	SURFACE CLOSER	4040XP HEDA	<input type="checkbox"/>		689	LCN
2	EA	KICK PLATE	8400 10" X 2" LDW B-CS	<input type="checkbox"/>		630	IVE
2	EA	WALL STOP	WS401/402CVX	<input type="checkbox"/>		626	IVE
1	EA	GASKETING	188SBK PSA (HEADER & JAMBS)	<input type="checkbox"/>		BK	ZER

DOOR MAY BE HELD OPEN WITH CLOSER ARM

HARDWARE GROUP NO. 23

FOR USE ON DOOR #(S):

C116B							
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PROVIDE EACH DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER			FINISH	MFR
1	EA	CONT. HINGE	114XY	<input type="checkbox"/>		628	IVE
1	EA	PANIC HARDWARE	CD-98-L-NL-06	<input type="checkbox"/>		626	VON
1	EA	MORTISE CYLINDER	20-002 X XQ11-949			626	SCH
1	EA	RIM CYLINDER	20-022	<input type="checkbox"/>		626	SCH
1	EA	SURFACE CLOSER	4040XP SHCUSH	<input type="checkbox"/>		689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	<input type="checkbox"/>		630	IVE
1	EA	GASKETING	188SBK PSA (HEADER & JAMBS)	<input type="checkbox"/>		BK	ZER

DOOR MAY BE HELD OPEN WITH CLOSER ARM

HARDWARE GROUP NO. 24

FOR USE ON DOOR #(S):

C116A							
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PROVIDE EACH DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER			FINISH	MFR
1	EA	CONT. HINGE	114XY	<input type="checkbox"/>		628	IVE
1	EA	PANIC HARDWARE	CD-98-L-NL-06	<input type="checkbox"/>		626	VON
1	EA	MORTISE CYLINDER	20-002 X XQ11-949			626	SCH
1	EA	RIM	20-022	<input type="checkbox"/>		626	SCH

		CYLINDER				
1	EA	SURFACE CLOSER	4040XP HEDA	<input type="checkbox"/>	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	<input type="checkbox"/>	630	IVE
1	EA	WALL STOP	WS401/402CVX	<input type="checkbox"/>	626	IVE
1	EA	GASKETING	188SBK PSA (HEADER & JAMBS)	<input type="checkbox"/>	BK	ZER

DOOR MAY BE HELD OPEN WITH CLOSER ARM

HARDWARE GROUP NO. 26

FOR USE ON DOOR #(S):

B114	B115	B214	B215		
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PROVIDE EACH DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5	<input type="checkbox"/>	652	IVE
1	EA	FACULTY RESTROOM/HOTEL W/ OUTSIDE INDICATOR W/ INSIDE INDICATOR	L9485P6 06A 09-544 OS-OCC IS-LOC	<input type="checkbox"/>	626	SCH
1	EA	MORTISE CYLINDER	30-022 X L583-475	<input type="checkbox"/>	626	SCH
1	EA	SURFACE CLOSER	4040XP HEDA	<input type="checkbox"/>	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	<input type="checkbox"/>	630	IVE
1	EA	WALL STOP	WS401/402CVX	<input type="checkbox"/>	626	IVE
1	EA	GASKETING	188SBK PSA (HEADER & JAMBS)	<input type="checkbox"/>	BK	ZER

DOOR MAY BE HELD OPEN WITH CLOSER ARM

HARDWARE GROUP NO. 27

FOR USE ON DOOR #(S):

B103					
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PROVIDE EACH DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
1	EA	CONT. HINGE	114XY	<input type="checkbox"/>	628	IVE
1	EA	OFFICE W/SIM RETRACT W/ OUTSIDE INDICATOR W/ INSIDE INDICATOR	L9056P6 06A 09-544 OS-OCC IS-LOC	<input type="checkbox"/>	626	SCH

1	EA	SURFACE CLOSER	4040XP HEDA	<input type="checkbox"/>		689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	<input type="checkbox"/>		630	IVE
1	EA	WALL STOP	WS401/402CVX	<input type="checkbox"/>		626	IVE
1	EA	GASKETING	188SBK PSA (HEADER & JAMBS)	<input type="checkbox"/>		BK	ZER

**DOOR MAY BE HELD OPEN WITH CLOSER ARM
HARDWARE GROUP NO. 28**

FOR USE ON DOOR #(S):

D126	F114	F119			
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PROVIDE EACH DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER			FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	<input type="checkbox"/>		652	IVE
1	EA	OFFICE W/SIM RETRACT W/ OUTSIDE INDICATOR W/ INSIDE INDICATOR	L9056P6 06A 09-544 OS-OCC IS-LOC	<input type="checkbox"/>		626	SCH
1	EA	OH STOP	90S J	<input type="checkbox"/>		630	GLY
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	<input type="checkbox"/>		630	IVE
1	EA	GASKETING	188SBK PSA (HEADER & JAMBS)	<input type="checkbox"/>		BK	ZER

HARDWARE GROUP NO. 29

FOR USE ON DOOR #(S):

A123	A124	A223	A224	B117	B118
B217	B218	E117	E118	F123	F126

PROVIDE EACH DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER			FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5	<input type="checkbox"/>		652	IVE
1	EA	OFFICE W/SIM RETRACT W/ OUTSIDE INDICATOR W/ INSIDE	L9056P6 06A 09-544 OS-OCC IS-LOC	<input type="checkbox"/>		626	SCH

		INDICATOR				
1	EA	SURFACE CLOSER	4040XP HEDA	<input type="checkbox"/>		689 LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	<input type="checkbox"/>		630 IVE
1	EA	WALL STOP	WS401/402CVX	<input type="checkbox"/>		626 IVE
1	EA	GASKETING	188SBK PSA (HEADER & JAMBS)	<input type="checkbox"/>		BK ZER

DOOR MAY BE HELD OPEN WITH CLOSER ARM

HARDWARE GROUP NO. 30

FOR USE ON DOOR #(S):

A118	A120	A128	A129	A218	A220
B110	B111	B123	B125	B210	C118
C221	D104	D118	E102	E106	F124

PROVIDE EACH DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5 NRP	<input type="checkbox"/>	652	IVE
1	EA	STOREROOM LOCK	ND80P6D RHO	<input type="checkbox"/>	626	SCH
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	<input type="checkbox"/>	630	IVE
1	EA	WALL STOP	WS401/402CVX	<input type="checkbox"/>	626	IVE
3	EA	SILENCER	SR64	<input type="checkbox"/>	GRY	IVE

HARDWARE GROUP NO. 31

FOR USE ON DOOR #(S):

D135A	D135C				
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PROVIDE EACH DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5 NRP	<input type="checkbox"/>	652	IVE
1	EA	STOREROOM LOCK	ND80P6D RHO	<input type="checkbox"/>	626	SCH
1	EA	WALL STOP	WS401/402CVX	<input type="checkbox"/>	626	IVE
3	EA	SILENCER	SR64	<input type="checkbox"/>	GRY	IVE

HARDWARE GROUP NO. 32

FOR USE ON DOOR #(S):

D136	F109				
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PROVIDE EACH DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	<input type="checkbox"/>	652	IVE
1	EA	STOREROOM	ND80P6D RHO	<input type="checkbox"/>	626	SCH

		LOCK				
1	EA	WALL STOP	WS401/402CVX	<input type="checkbox"/>		626 IVE
3	EA	SILENCER	SR64	<input type="checkbox"/>		GRY IVE

HARDWARE GROUP NO. 33

FOR USE ON DOOR #(S):

C119	D137				
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PROVIDE EACH DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
1	EA	CONT. HINGE	114XY	<input type="checkbox"/>	628	IVE
1	EA	STOREROOM LOCK	ND80P6D RHO	<input type="checkbox"/>	626	SCH
1	EA	WALL STOP	WS401/402CVX	<input type="checkbox"/>	626	IVE
3	EA	SILENCER	SR64	<input type="checkbox"/>	GRY	IVE

HARDWARE GROUP NO. 34

FOR USE ON DOOR #(S):

A204	B213	C110	C113	C121	C212
C217	D123	D129A	D129B	E119	

PROVIDE EACH DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	<input type="checkbox"/>	652	IVE
1	EA	STOREROOM LOCK	ND80P6D RHO	<input type="checkbox"/>	626	SCH
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	<input type="checkbox"/>	630	IVE
1	EA	WALL STOP	WS401/402CVX	<input type="checkbox"/>	626	IVE
3	EA	SILENCER	SR64	<input type="checkbox"/>	GRY	IVE

HARDWARE GROUP NO. 35

FOR USE ON DOOR #(S):

A130	A131	C209			
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PROVIDE EACH DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5 NRP	<input type="checkbox"/>	652	IVE
1	EA	STOREROOM LOCK	ND80P6D RHO	<input type="checkbox"/>	626	SCH
1	EA	OH STOP	90S	<input type="checkbox"/>	630	GLY
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	<input type="checkbox"/>	630	IVE
3	EA	SILENCER	SR64	<input type="checkbox"/>	GRY	IVE

HARDWARE GROUP NO. 36

FOR USE ON DOOR #(S):

B113					
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PROVIDE EACH DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
1	EA	CONT. HINGE	114XY	<input type="checkbox"/>	628	IVE
1	EA	STOREROOM LOCK	ND80P6D RHO	<input type="checkbox"/>	626	SCH
1	EA	OH STOP	90S	<input type="checkbox"/>	630	GLY
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	<input type="checkbox"/>	630	IVE
3	EA	SILENCER	SR64	<input type="checkbox"/>	GRY	IVE

HARDWARE GROUP NO. 37

FOR USE ON DOOR #(S):

C112C					
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PROVIDE EACH DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5 NRP	<input type="checkbox"/>	652	IVE
1	EA	STOREROOM LOCK	ND80P6D RHO	<input type="checkbox"/>	626	SCH
1	EA	SURFACE CLOSER	4040XP HEDA	<input type="checkbox"/>	689	LCN
1	EA	WALL STOP	WS401/402CVX	<input type="checkbox"/>	626	IVE
3	EA	SILENCER	SR64	<input type="checkbox"/>	GRY	IVE

DOOR MAY BE HELD OPEN WITH CLOSER ARM

HARDWARE GROUP NO. 38

FOR USE ON DOOR #(S):

D122	D134				
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PROVIDE EACH DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
6	EA	HINGE	5BB1HW 4.5 X 4.5 NRP	<input type="checkbox"/>	652	IVE
1	EA	MANUAL FLUSH BOLT (TOP ONLY)	FB358	<input type="checkbox"/>	626	IVE
1	EA	STOREROOM LOCK	ND80P6D RHO	<input type="checkbox"/>	626	SCH
2	EA	KICK PLATE	8400 10" X 2" LDW B-CS	<input type="checkbox"/>	630	IVE
2	EA	WALL STOP	WS401/402CVX	<input type="checkbox"/>	626	IVE
2	EA	SILENCER	SR64	<input type="checkbox"/>	GRY	IVE

HARDWARE GROUP NO. 39

FOR USE ON DOOR #(S):

A209

PROVIDE EACH DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
6	EA	HINGE	5BB1 4.5 X 4.5 NRP	<input type="checkbox"/>	652	IVE
1	EA	MANUAL FLUSH BOLT	FB358 (TOP ONLY)	<input type="checkbox"/>	626	IVE
1	EA	STOREROOM LOCK	ND80P6D RHO	<input type="checkbox"/>	626	SCH
2	EA	KICK PLATE	8400 10" X 2" LDW B-CS	<input type="checkbox"/>	630	IVE
2	EA	WALL STOP	WS401/402CVX	<input type="checkbox"/>	626	IVE
2	EA	SILENCER	SR64	<input type="checkbox"/>	GRY	IVE

HARDWARE GROUP NO. 40

FOR USE ON DOOR #(S):

D138

PROVIDE EACH DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
1	EA	CONT. HINGE	114XY	<input type="checkbox"/>	628	IVE
1	EA	PANIC HARDWARE	LD-98-L-NL-4'-06	<input type="checkbox"/>	626	VON
1	EA	RIM CYLINDER	20-022	<input type="checkbox"/>	626	SCH
1	EA	SURFACE CLOSER	4040XP HEDA	<input type="checkbox"/>	689	LCN
1	EA	WALL STOP	WS401/402CVX	<input type="checkbox"/>	626	IVE
3	EA	SILENCER	SR64	<input type="checkbox"/>	GRY	IVE

DOOR MAY BE HELD OPEN WITH CLOSER ARM

HARDWARE GROUP NO. 41

FOR USE ON DOOR #(S):

C215

PROVIDE EACH DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
6	EA	HINGE	5BB1HW 4.5 X 4.5 NRP	<input type="checkbox"/>	652	IVE
1	EA	PANIC HARDWARE	LD-9849-EO-LBL	<input type="checkbox"/>	626	VON
1	EA	PANIC HARDWARE	LD-9849-L-NL-06-LBL	<input type="checkbox"/>	626	VON

1	EA	RIM CYLINDER	20-022	<input type="checkbox"/>		626	SCH
2	EA	SURFACE CLOSER	4040XP EDA	<input type="checkbox"/>		689	LCN
2	EA	400LB WALL MAG	2510 LPB		~	630	ABH
1	EA	GASKETING	188SBK PSA (HEADER & JAMBS)	<input type="checkbox"/>		BK	ZER
1	EA	KEY SWITCH	BY DIVISION 28.		~		

CONNECT MAGNETIC DOOR HOLDER TO EMERGENCY SYSTEM

OPERATION:

**KEY SWITCH TURN ON/OFF POWER TO THE MAGNETIC DOOR HOLDER
DOOR IS LATCHED AND SECURED UPON LOSS OF POWER TO THE MAG HOLDER**

HARDWARE GROUP NO. 42

FOR USE ON DOOR #(S):

C108	C109	C114	C206	C207	C208
D110	D116	D117	D132	E101	E103
E104	E105	E112	E113A	E114	E115
F116A	F116B	F118A	F118B		

PROVIDE EACH DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER			FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	<input type="checkbox"/>		652	IVE
1	EA	ENTRANCE LOCK	ND53P6D RHO	<input type="checkbox"/>		626	SCH
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	<input type="checkbox"/>		630	IVE
1	EA	WALL STOP	WS401/402CCV	<input type="checkbox"/>		626	IVE
1	EA	GASKETING	188SBK PSA (HEADER & JAMBS)	<input type="checkbox"/>		BK	ZER

HARDWARE GROUP NO. 43

FOR USE ON DOOR #(S):

E123A					
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PROVIDE EACH DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER			FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	<input type="checkbox"/>		652	IVE
1	EA	ENTRANCE LOCK	ND53P6D RHO	<input type="checkbox"/>		626	SCH
1	EA	OH STOP	90S J	<input type="checkbox"/>		630	GLY
1	EA	KICK PLATE	8400 10" X	<input type="checkbox"/>		630	IVE

			2" LDW B-CS				
1	EA	GASKETING	188SBK PSA (HEADER & JAMBS)	<input type="checkbox"/>		BK	ZER

HARDWARE GROUP NO. 44

FOR USE ON DOOR #(S):

E126							
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PROVIDE EACH DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER			FINISH	MFR
6	EA	HINGE	5BB1 4.5 X 4.5	<input type="checkbox"/>		652	IVE
1	EA	MANUAL FLUSH BOLT	FB457	<input type="checkbox"/>		626	IVE
1	EA	CLASSROOM LOCK	ND70P6D RHO	<input type="checkbox"/>		626	SCH
2	EA	OH STOP	90S	<input type="checkbox"/>		630	GLY
2	EA	KICK PLATE	8400 10" X 2" LDW B- CS	<input type="checkbox"/>		630	IVE
2	EA	SILENCER	SR64	<input type="checkbox"/>		GRY	IVE

HARDWARE GROUP NO. 45

FOR USE ON DOOR #(S):

C120							
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PROVIDE EACH DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER			FINISH	MFR
1	EA	CONT. HINGE	114XY	<input type="checkbox"/>		628	IVE
1	EA	ENTRANCE LOCK	ND53P6D RHO	<input type="checkbox"/>		626	SCH
1	EA	KICK PLATE	8400 10" X 2" LDW B- CS	<input type="checkbox"/>		630	IVE
1	EA	WALL STOP/HOLDER	WS45X	<input type="checkbox"/>		626	IVE
3	EA	SILENCER	SR64	<input type="checkbox"/>		GRY	IVE

HARDWARE GROUP NO. 46

FOR USE ON DOOR #(S):

D139							
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PROVIDE EACH DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER			FINISH	MFR
4	EA	HINGE	5BB1 4.5 X 4.5 NRP	<input type="checkbox"/>		652	IVE

1	EA	DUTCH DOOR BOLT	054	<input type="checkbox"/>		626	IVE
1	EA	ENTRANCE LOCK	ND53P6D RHO	<input type="checkbox"/>		626	SCH
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	<input type="checkbox"/>		630	IVE
1	EA	WALL STOP	WS401/402CVX	<input type="checkbox"/>		626	IVE
1	EA	WALL STOP/HOLDER	WS45X	<input type="checkbox"/>		626	IVE
4	EA	SILENCER	SR64	<input type="checkbox"/>		GRY	IVE

HARDWARE GROUP NO. 47

FOR USE ON DOOR #(S):

C115B					
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PROVIDE EACH DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER			FINISH	MFR
2	EA	CONT. HINGE	114XY	<input type="checkbox"/>		628	IVE
1	EA	REMOVABLE MULLION	4954 STAB	<input type="checkbox"/>		689	VON
2	EA	PANIC HARDWARE	LD-98-EO	<input type="checkbox"/>		626	VON
2	EA	SURFACE CLOSER	4040XP SHCUSH	<input type="checkbox"/>		689	LCN
2	EA	KICK PLATE	8400 10" X 2" LDW B-CS	<input type="checkbox"/>		630	IVE
1	EA	MULLION SEAL	8780NBK PSA	<input type="checkbox"/>		BK	ZER
2	EA	SILENCER	SR64	<input type="checkbox"/>		GRY	IVE

EXIT ONLY

DOOR MAY BE HELD OPEN WITH CLOSER ARM

HARDWARE GROUP NO. 48

FOR USE ON DOOR #(S):

D109	D112	D113	E122		
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PROVIDE EACH DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER			FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	<input type="checkbox"/>		652	IVE
1	EA	PASSAGE SET	ND10S RHO	<input type="checkbox"/>		626	SCH
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	<input type="checkbox"/>		630	IVE
1	EA	WALL STOP	WS401/402CVX	<input type="checkbox"/>		626	IVE
1	EA	GASKETING	188SBK PSA (HEADER & JAMBS)	<input type="checkbox"/>		BK	ZER

HARDWARE GROUP NO. 49

FOR USE ON DOOR #(S):

D114	D115	E116			
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PROVIDE EACH DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER			FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	<input type="checkbox"/>		652	IVE
1	EA	PASSAGE SET	ND10S RHO	<input type="checkbox"/>		626	SCH
1	EA	WALL STOP	WS401/402CVX	<input type="checkbox"/>		626	IVE
3	EA	SILENCER	SR64	<input type="checkbox"/>		GRY	IVE

HARDWARE GROUP NO. 50

FOR USE ON DOOR #(S):

B108B					
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PROVIDE EACH DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER			FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	<input type="checkbox"/>		652	IVE
1	EA	PASSAGE SET	ND10S RHO	<input type="checkbox"/>		626	SCH
1	EA	SURFACE CLOSER	4040XP EDA	<input type="checkbox"/>		689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	<input type="checkbox"/>		630	IVE
1	EA	MAGNETIC DOOR HOLDER	SEM7850 12V/24V/120V	<input type="checkbox"/>	~	689	LCN
1	EA	GASKETING	188SBK PSA (HEADER & JAMBS)	<input type="checkbox"/>		BK	ZER

**CONNECT MAGNETIC DOOR HOLDER TO FIRE ALARM SYSTEM
COORDINATE WITH WOOD DOOR MANUFACTURER TO PROVIDE FIRE DOOR WITH INTUMESCENT SEAL PER CODE**

HARDWARE GROUP NO. 51

FOR USE ON DOOR #(S):

D125					
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PROVIDE EACH DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER			FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	<input type="checkbox"/>		652	IVE
1	EA	PASSAGE SET	ND10S RHO	<input type="checkbox"/>		626	SCH
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	<input type="checkbox"/>		630	IVE
1	EA	WALL STOP	WS401/402CVX	<input type="checkbox"/>		626	IVE

3	EA	SILENCER	SR64	<input type="checkbox"/>		GRY	IVE
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HARDWARE GROUP NO. 52

FOR USE ON DOOR #(S):

A119	A219	D131A	F105B				
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PROVIDE EACH DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER			FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	<input type="checkbox"/>		652	IVE
1	EA	CLASSROOM LOCK	ND70P6D RHO	<input type="checkbox"/>		626	SCH
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	<input type="checkbox"/>		630	IVE
1	EA	WALL STOP	WS401/402CVX	<input type="checkbox"/>		626	IVE
3	EA	SILENCER	SR64	<input type="checkbox"/>		GRY	IVE

HARDWARE GROUP NO. 52A

FOR USE ON DOOR #(S):

C102B							
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PROVIDE EACH DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER			FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	<input type="checkbox"/>		652	IVE
1	EA	DBL CYL STORE LOCK	ND66P6D RHO	<input type="checkbox"/>		626	SCH
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	<input type="checkbox"/>		630	IVE
1	EA	WALL STOP	WS401/402CVX	<input type="checkbox"/>		626	IVE
3	EA	SILENCER	SR64	<input type="checkbox"/>		GRY	IVE

HARDWARE GROUP NO. 52B

FOR USE ON DOOR #(S):

B124A	B124B	B224A	B224B	C202A	C202B		
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PROVIDE EACH DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER			FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	<input type="checkbox"/>		652	IVE
1	EA	CLASSROOM SECURITY	ND78P6D RHO IS-CRS	<input type="checkbox"/>		626	SCH
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	<input type="checkbox"/>		630	IVE
1	EA	WALL STOP	WS401/402CVX	<input type="checkbox"/>		626	IVE
3	EA	SILENCER	SR64	<input type="checkbox"/>		GRY	IVE

HARDWARE GROUP NO. 53

FOR USE ON DOOR #(S):

D130B	D130E						
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PROVIDE EACH DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG			FINISH	MFR
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			NUMBER			
3	EA	HINGE	5BB1 4.5 X 4.5 NRP	<input type="checkbox"/>		652 IVE
1	EA	ENTRANCE LOCK	ND53P6D RHO	<input type="checkbox"/>		626 SCH
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	<input type="checkbox"/>		630 IVE
1	EA	WALL STOP/HOLDER	WS45X	<input type="checkbox"/>		626 IVE
3	EA	SILENCER	SR64	<input type="checkbox"/>		GRY IVE

HARDWARE GROUP NO. 54

FOR USE ON DOOR #(S):

D103	D120				
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PROVIDE EACH DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5 NRP	<input type="checkbox"/>	652	IVE
1	EA	CLASSROOM LOCK	ND70P6D RHO	<input type="checkbox"/>	626	SCH
1	EA	OH STOP	90S	<input type="checkbox"/>	630	GLY
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	<input type="checkbox"/>	630	IVE
3	EA	SILENCER	SR64	<input type="checkbox"/>	GRY	IVE

HARDWARE GROUP NO. 55

FOR USE ON DOOR #(S):

C102C					
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PROVIDE EACH DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
1	EA	CONT. HINGE	114XY	<input type="checkbox"/>	628	IVE
1	EA	DBL CYL STORE LOCK	ND66P6D RHO	<input type="checkbox"/>	626	SCH
1	EA	OH STOP	90S	<input type="checkbox"/>	630	GLY
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	<input type="checkbox"/>	630	IVE
3	EA	SILENCER	SR64	<input type="checkbox"/>	GRY	IVE

HARDWARE GROUP NO. 56

FOR USE ON DOOR #(S):

F107	F108				
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PROVIDE EACH DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
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3	EA	HINGE	5BB1 4.5 X 4.5	<input type="checkbox"/>	652	IVE
1	EA	CLASSROOM LOCK	ND70P6D RHO	<input type="checkbox"/>	626	SCH
1	EA	WALL STOP	WS401/402CVX	<input type="checkbox"/>	626	IVE
3	EA	SILENCER	SR64	<input type="checkbox"/>	GRY	IVE

HARDWARE GROUP NO. 57

FOR USE ON DOOR #(S):

F105A	F106					
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PROVIDE EACH DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
6	EA	HINGE	5BB1 4.5 X 4.5 NRP	<input type="checkbox"/>	652	IVE
1	EA	MANUAL FLUSH BOLT	FB457	<input type="checkbox"/>	626	IVE
1	EA	CLASSROOM LOCK	ND70P6D RHO	<input type="checkbox"/>	626	SCH
2	EA	WALL STOP	WS401/402CVX	<input type="checkbox"/>	626	IVE
2	EA	SILENCER	SR64	<input type="checkbox"/>	GRY	IVE

HARDWARE GROUP NO. 58

FOR USE ON DOOR #(S):

D124						
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PROVIDE EACH DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
6	EA	HINGE	5BB1HW 4.5 X 4.5 NRP	<input type="checkbox"/>	652	IVE
1	EA	MANUAL FLUSH BOLT	FB358 (TOP ONLY)	<input type="checkbox"/>	626	IVE
1	EA	CLASSROOM LOCK	ND70P6D RHO	<input type="checkbox"/>	626	SCH
2	EA	KICK PLATE	8400 10" X 2" LDW B-CS	<input type="checkbox"/>	630	IVE
2	EA	WALL STOP/HOLDER	WS45X	<input type="checkbox"/>	626	IVE
2	EA	SILENCER	SR64	<input type="checkbox"/>	GRY	IVE

HARDWARE GROUP NO. 59

FOR USE ON DOOR #(S):

D127A						
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PROVIDE EACH DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	<input type="checkbox"/>	652	IVE

NRP						
1	EA	ENTRANCE LOCK	ND53P6D RHO	<input type="checkbox"/>	626	SCH
1	EA	SURFACE CLOSER	4040XP HEDA	<input type="checkbox"/>	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	<input type="checkbox"/>	630	IVE
1	EA	WALL STOP	WS401/402CVX	<input type="checkbox"/>	626	IVE
3	EA	SILENCER	SR64	<input type="checkbox"/>	GRY	IVE

DOOR MAY BE HELD OPEN WITH CLOSER ARM

HARDWARE GROUP NO. 60

FOR USE ON DOOR #(S):

B102	C214					
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PROVIDE EACH DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5	<input type="checkbox"/>	652	IVE
1	EA	TIME OUT LOCK	ND45 RHO XN12-317	<input type="checkbox"/>	626	SCH
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	<input type="checkbox"/>	630	IVE
1	EA	WALL STOP	WS401/402CVX	<input type="checkbox"/>	626	IVE
1	EA	GASKETING	188SBK PSA (HEADER & JAMBS)	<input type="checkbox"/>	BK	ZER

HARDWARE GROUP NO. 61

FOR USE ON DOOR #(S):

F115	F120					
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PROVIDE EACH DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
1	EA	CONT. HINGE	114XY	<input type="checkbox"/>	628	IVE
1	EA	CLASSROOM DEADBOLT	B563P6	<input type="checkbox"/>	626	SCH
1	EA	PUSH PLATE	8200 6" X 16" CFC	<input type="checkbox"/>	630	IVE
1	EA	PULL PLATE	8305 10" 4" X 16" CFC	<input type="checkbox"/>	630	IVE
1	EA	SURFACE CLOSER	4040XP HEDA	<input type="checkbox"/>	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	<input type="checkbox"/>	630	IVE
1	EA	WALL STOP	WS401/402CVX	<input type="checkbox"/>	626	IVE
3	EA	SILENCER	SR64	<input type="checkbox"/>	GRY	IVE

DOOR MAY BE HELD OPEN WITH CLOSER ARM

HARDWARE GROUP NO. 62

FOR USE ON DOOR #(S):

C102A					
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PROVIDE EACH DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
6	EA	HINGE	5BB1 4.5 X 4.5 NRP	<input type="checkbox"/>	652	IVE
2	EA	MANUAL FLUSH BOLT	FB457	<input type="checkbox"/>	626	IVE
1	EA	DUST PROOF STRIKE	DP1 OR DP2 AS REQ'D	<input type="checkbox"/>	626	IVE
1	EA	EXIT X BLANK OUTSIDE	ND25D RHO	<input type="checkbox"/>	626	SCH
1	EA	OH STOP	90S	<input type="checkbox"/>	630	GLY
1	EA	SURFACE CLOSER	4040XP SCUSH	<input type="checkbox"/>	689	LCN
1	SET	GASKETING	429 @ HEAD & JAMBS	<input type="checkbox"/>	AA	ZER
2	EA	DOOR SWEEP	39A	<input type="checkbox"/>	A	ZER
1	EA	OVERLAPPING ASTRAGAL	43STST	<input type="checkbox"/>	STST	ZER
1	EA	THRESHOLD	655A - OR PER SILL DETAILS	<input type="checkbox"/>	A	ZER

EXIT ONLY

HARDWARE GROUP NO. 64

FOR USE ON DOOR #(S):

C112B	D101B	D101C	D101D	D107	D127B
D130A	D130C	D130D	D131B	D133	D135B
E113B	G101B	G102B			

PROVIDE EACH DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
1	EA	MORTISE CYL TURN	09-900 X RING AS REQ'D		626	SCH
	EA	NOTE	ALL HARDWARE BY ROLLUP DOOR MANUFACTURER			

HARDWARE GROUP NO. A01

FOR USE ON DOOR #(S):

A104A	A109A	F101A	F104D		
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PROVIDE EACH DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER			FINISH	MFR
2	EA	CONT. HINGE	112XY EPT	<input type="checkbox"/>		628	IVE
2	EA	POWER TRANSFER	EPT10 CON	<input type="checkbox"/>	~	689	VON
1	EA	REMOVABLE MULLION	KR4954 STAB	<input type="checkbox"/>		689	VON
1	EA	ELEC PANIC HARDWARE	RX-QEL-98-DT-CON 24 VDC	<input type="checkbox"/>	~	626	VON
1	EA	ELEC PANIC HARDWARE	RX-QEL-98-NL-CON 24 VDC	<input type="checkbox"/>	~	626	VON
1	EA	FSIC RIM CYL. HOUSING	20-079	<input type="checkbox"/>		626	SCH
1	EA	FSIC MORTISE CYL. HOUSING	26-094 (CAM & RING AS REQ'D)			626	SCH
1	EA	PRIMUS CORE	20-740-XP	<input type="checkbox"/>		626	SCH
1	EA	FSIC CORE	23-030 (FOR KEYED MULLION)	<input type="checkbox"/>		626	SCH
2	EA	OH STOP	100S ADJ	<input type="checkbox"/>		630	GLY
2	EA	SURFACE CLOSER	4040XP EDAW/62G	<input type="checkbox"/>		689	LCN
2	EA	DROP PLATE	PROVIDE AS NECESSARY			689	
2	EA	CUSH SHOE SUPPORT	4040XP-30 SRT	<input type="checkbox"/>		689	LCN
1	EA	MULLION SEAL	8780NBK PSA	<input type="checkbox"/>		BK	ZER
1	EA	WEATHERSTRIPPING	DOOR/FRAME MANUFACTURER.				
2	EA	DOOR SWEEP	DOOR/FRAME MANUFACTURER.				
1	EA	THRESHOLD	DOOR/FRAME MANUFACTURER.				
2	EA	WIRE HARNESS (FROM DEVICE TO HINGE)	CON-XXXP (LENGTH TO SUIT) VERIFY LENGTH		~		SCH
2	EA	POWER SUPPLY WIRE HARNESS	CON-6W		~		SCH
1	EA	CREDENTIAL READER	BY DIVISION 28.		~		
2	EA	DOOR POSITION SWITCH	BY DIVISION 28.		~		
1	EA	LOW VOLTAGE POWER	BY LOW VOLTAGE.		~		

HARDWARE IS FOR STOREFRONT SYSTEM WITH 1-3/4" THICK WIDE STILE DOOR

OPERATION:

DOOR IS NORMALLY LATCHED AND SECURED

DOOR MAY BE PROGRAMMED TO REMAIN UNLOCKED ON A SCHEDULE THROUGH ACCESS CONTROL SYSTEM

PRESENTING VALID CREDENTIAL TEMPORALLY RETRACTS LATCHBOLT FOR ENTRY WHEN DOOR IS LOCKED

DOOR IS MONITORED THROUGH ACCESS CONTROL OR SECURITY SYSTEM

DOOR IS SECURED UPON LOSS OF POWER TO THE DEVICE

FREE EGRESS AT ALL TIMES

HARDWARE GROUP NO. A02

FOR USE ON DOOR #(S):

E110A	F103A				
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PROVIDE EACH DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER			FINISH	MFR
2	EA	CONT. HINGE	112XY EPT	<input type="checkbox"/>		628	IVE
2	EA	POWER TRANSFER	EPT10 CON	<input type="checkbox"/>	~	689	VON
1	EA	REMOVABLE MULLION	KR4954 STAB	<input type="checkbox"/>		689	VON
1	EA	ELEC PANIC HARDWARE	LX-RX-QEL-98-NL-CON 24 VDC	<input type="checkbox"/>	~	626	VON
1	EA	ELEC PANIC HARDWARE	RX-QEL-98-DT-CON 24 VDC	<input type="checkbox"/>	~	626	VON
1	EA	FSIC RIM CYL. HOUSING	20-079	<input type="checkbox"/>		626	SCH
1	EA	FSIC MORTISE CYL. HOUSING	26-094 (CAM & RING AS REQ'D)			626	SCH
1	EA	PRIMUS CORE	20-740-XP	<input type="checkbox"/>		626	SCH
1	EA	FSIC CORE	23-030 (FOR KEYED MULLION) (FOR MULLION)	<input type="checkbox"/>		626	SCH
2	EA	OH STOP	100S ADJ	<input type="checkbox"/>		630	GLY
1	EA	SURFACE CLOSER	4040XP EDAW/62G	<input type="checkbox"/>		689	LCN
1	EA	DROP PLATE	PROVIDE AS NECESSARY			689	
1	EA	SURF. AUTO OPERATOR	4642 WMS 120 VAC	<input type="checkbox"/>	~	689	LCN
1	EA	CUSH SHOE SUPPORT	4040XP-30 SRT	<input type="checkbox"/>		689	LCN
1	EA	WEATHER RING	8310-801	<input type="checkbox"/>			LCN
2	EA	ACTUATOR, TOUCHLESS	8310-810D	<input type="checkbox"/>		630	LCN
1	EA	MULLION SEAL	8780NBK PSA	<input type="checkbox"/>		BK	ZER
1	EA	WEATHERSTRIPPING	BY ALUMINUM DOOR/FRAME MANUFACTURER.				

2	EA	DOOR SWEEP	BY ALUMINUM DOOR/FRAME MANUFACTURER.				
1	EA	THRESHOLD	BY ALUMINUM DOOR/FRAME MANUFACTURER.				
2	EA	WIRE HARNESS (FROM DEVICE TO HINGE)	CON-XXXX (LENGTH TO SUIT) VERIFY LENGTH		~		SCH
2	EA	POWER SUPPLY WIRE HARNESS	CON-6W		~		SCH
1	EA	CREDENTIAL READER	BY DIVISION 28.		~		
2	EA	DOOR POSITION SWITCH	BY DIVISION 28.		~		
1	EA	LOW VOLTAGE POWER	BY LOW VOLTAGE.		~		

HARDWARE IS FOR STOREFRONT SYSTEM WITH 1-3/4" THICK WIDE STILE DOOR

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

EXTERIOR ACTURATOR IS CONTROLLED BY ACCESS CONTROL SYSTEM; INTERIOR ACTUATOR IS ALWAYS ACTIVE

DOOR IS MONITORED THROUGH ACCESS CONTROL OR SECURITY SYSTEM

DOOR IS SECURED UPON LOSS OF POWER TO THE DEVICE

FREE EGRESS AT ALL TIMES

HARDWARE GROUP NO. A03

FOR USE ON DOOR #(S):

E110D						
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PROVIDE EACH DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER			FINISH	MFR
2	EA	CONT. HINGE	112XY EPT	<input type="checkbox"/>		628	IVE
2	EA	POWER TRANSFER	EPT10 CON	<input type="checkbox"/>	~	689	VON
1	EA	REMOVABLE MULLION	KR4954 STAB	<input type="checkbox"/>		689	VON
1	EA	ELEC PANIC HARDWARE	LX-QEL-98-NL-CON 24 VDC	<input type="checkbox"/>	~	626	VON
1	EA	ELEC PANIC HARDWARE	QEL-98-DT-CON 24 VDC	<input type="checkbox"/>	~	626	VON
1	EA	FSIC RIM CYL. HOUSING	20-079	<input type="checkbox"/>		626	SCH
1	EA	FSIC MORTISE CYL. HOUSING	26-094 (CAM & RING AS REQ'D)			626	SCH
1	EA	PRIMUS CORE	20-740-XP	<input type="checkbox"/>		626	SCH

1	EA	FSIC CORE	23-030 (FOR KEYED MULLION) (FOR MULLION)	<input type="checkbox"/>		626	SCH
2	EA	OH STOP	100S ADJ	<input type="checkbox"/>		630	GLY
1	EA	SURFACE CLOSER	4040XP EDAW/62G	<input type="checkbox"/>		689	LCN
1	EA	DROP PLATE	PROVIDE AS NECESSARY			689	
1	EA	SURF. AUTO OPERATOR	4642 WMS 120 VAC	<input type="checkbox"/>	~	689	LCN
1	EA	CUSH SHOE SUPPORT	4040XP-30 SRT	<input type="checkbox"/>		689	LCN
2	EA	ACTUATOR, TOUCHLESS	8310-810D	<input type="checkbox"/>		630	LCN
1	EA	MULLION SEAL	8780NBK PSA	<input type="checkbox"/>		BK	ZER
1	EA	WEATHERSTRIPPING	BY ALUMINUM DOOR/FRAME MANUFACTURER.				
1	EA	THRESHOLD	BY ALUMINUM DOOR/FRAME MANUFACTURER.				
2	EA	WIRE HARNESS (FROM DEVICE TO HINGE)	CON-XXXP (LENGTH TO SUIT) VERIFY LENGTH		~		SCH
2	EA	POWER SUPPLY WIRE HARNESS	CON-6W		~		SCH
1	EA	CREDENTIAL READER	BY DIVISION 28.		~		
1	EA	LOW VOLTAGE POWER	BY LOW VOLTAGE.		~		

HARDWARE IS FOR STOREFRONT SYSTEM WITH 1-3/4" THICK WIDE STILE DOOR

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

EXTERIOR ACTURATOR IS CONTROLLED BY ACCESS CONTROL SYSTEM; INTERIOR ACTUATOR IS ALWAYS ACTIVE

DOOR IS SECURED UPON LOSS OF POWER TO THE DEVICE

FREE EGRESS AT ALL TIMES

HARDWARE GROUP NO. A04

FOR USE ON DOOR #(S):

E110B	F103C				
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PROVIDE EACH DOOR(S) WITH THE FOLLOWING:

QTY	DESCRIPTION	CATALOG NUMBER	FINISH	MFR
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2	EA	CONT. HINGE	112XY EPT	<input type="checkbox"/>		628	IVE
2	EA	POWER TRANSFER	EPT10 CON	<input type="checkbox"/>	~	689	VON
1	EA	REMOVABLE MULLION	4954 STAB	<input type="checkbox"/>		689	VON
2	EA	ELEC PANIC HARDWARE	RX-QEL-98-DT-CON 24 VDC	<input type="checkbox"/>	~	626	VON
2	EA	OH STOP	100S ADJ	<input type="checkbox"/>		630	GLY
2	EA	SURFACE CLOSER	4040XP EDAW/62G	<input type="checkbox"/>		689	LCN
2	EA	DROP PLATE	PROVIDE AS NECESSARY			689	
2	EA	CUSH SHOE SUPPORT	4040XP-30 SRT	<input type="checkbox"/>		689	LCN
1	EA	MULLION SEAL	8780NBK PSA	<input type="checkbox"/>		BK	ZER
1	EA	WEATHERSTRIPPING	BY ALUMINUM DOOR/FRAME MANUFACTURER.				
2	EA	DOOR SWEEP	BY ALUMINUM DOOR/FRAME MANUFACTURER.				
1	EA	THRESHOLD	BY ALUMINUM DOOR/FRAME MANUFACTURER.				
2	EA	WIRE HARNESS (FROM DEVICE TO HINGE)	CON-XXXX (LENGTH TO SUIT) VERIFY LENGTH		~		SCH
2	EA	POWER SUPPLY WIRE HARNESS	CON-6W		~		SCH
2	EA	DOOR POSITION SWITCH	BY DIVISION 28.		~		
1	EA	LOW VOLTAGE POWER	BY LOW VOLTAGE.		~		

HARDWARE IS FOR STOREFRONT SYSTEM WITH 1-3/4" THICK WIDE STILE DOOR REFERENCE CARD READER AT DOOR #E110A/F103A

OPERATION:

DOOR IS NORMALLY LATCHED AND SECURED
 DOOR MAY BE PROGRAMMED TO REMAIN UNLOCKED ON A SCHEDULE THROUGH ACCESS CONTROL SYSTEM
 PRESENTING VALID CREDENTIAL TEMPORALLY RETRACTS LATCHBOLT FOR ENTRY WHEN DOOR IS LOCKED
 DOOR IS MONITORED THROUGH ACCESS CONTROL OR SECURITY SYSTEM
 DOOR IS SECURED UPON LOSS OF POWER TO THE DEVICE
 FREE EGRESS AT ALL TIMES

HARDWARE GROUP NO. A05

FOR USE ON DOOR #(S):

E110C					
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PROVIDE EACH DOOR(S) WITH THE FOLLOWING:

QTY	DESCRIPTION	CATALOG		FINISH	MFR
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			NUMBER				
2	EA	CONT. HINGE	112XY EPT	<input type="checkbox"/>		628	IVE
2	EA	POWER TRANSFER	EPT10 CON	<input type="checkbox"/>	~	689	VON
1	EA	REMOVABLE MULLION	4954 STAB	<input type="checkbox"/>		689	VON
2	EA	ELEC PANIC HARDWARE	QEL-98-DT-CON 24 VDC	<input type="checkbox"/>	~	626	VON
2	EA	OH STOP	100S ADJ	<input type="checkbox"/>		630	GLY
2	EA	SURFACE CLOSER	4040XP EDAW/62G	<input type="checkbox"/>		689	LCN
2	EA	DROP PLATE	PROVIDE AS NECESSARY			689	
2	EA	CUSH SHOE SUPPORT	4040XP-30 SRT	<input type="checkbox"/>		689	LCN
1	EA	MULLION SEAL	8780NBK PSA	<input type="checkbox"/>		BK	ZER
1	EA	WEATHERSTRIPPING	BY ALUMINUM DOOR/FRAME MANUFACTURER.				
2	EA	DOOR SWEEP	BY ALUMINUM DOOR/FRAME MANUFACTURER.				
1	EA	THRESHOLD	BY ALUMINUM DOOR/FRAME MANUFACTURER.				
2	EA	WIRE HARNESS (FROM DEVICE TO HINGE)	CON-XXXX (LENGTH TO SUIT) VERIFY LENGTH		~		SCH
2	EA	POWER SUPPLY WIRE HARNESS	CON-6W		~		SCH
1	EA	LOW VOLTAGE POWER	BY LOW VOLTAGE.		~		

HARDWARE IS FOR STOREFRONT SYSTEM WITH 1-3/4" THICK WIDE STILE DOOR REFERENCE CARD READER AT DOOR #E110D

OPERATION:

DOOR IS NORMALLY LATCHED AND SECURED
 DOOR MAY BE PROGRAMMED TO REMAIN UNLOCKED ON A SCHEDULE THROUGH ACCESS CONTROL SYSTEM
 PRESENTING VALID CREDENTIAL TEMPORALLY 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. A06

FOR USE ON DOOR #(S):

F104C					
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PROVIDE EACH DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER			FINISH	MFR
2	EA	CONT. HINGE	112XY	<input type="checkbox"/>		628	IVE

1	EA	REMOVABLE MULLION	4954 STAB	<input type="checkbox"/>		689	VON
2	EA	PANIC HARDWARE	LD-98-EO	<input type="checkbox"/>		626	VON
2	EA	OH STOP	100S ADJ	<input type="checkbox"/>		630	GLY
2	EA	SURFACE CLOSER	4040XP EDAW/62G	<input type="checkbox"/>		689	LCN
2	EA	DROP PLATE	PROVIDE AS NECESSARY			689	
2	EA	CUSH SHOE SUPPORT	4040XP-30 SRT	<input type="checkbox"/>		689	LCN
1	EA	MULLION SEAL	8780NBK PSA	<input type="checkbox"/>		BK	ZER
1	EA	WEATHERSTRIPPING	BY ALUMINUM DOOR/FRAME MANUFACTURER.				
2	EA	DOOR SWEEP	BY ALUMINUM DOOR/FRAME MANUFACTURER.				
1	EA	THRESHOLD	BY ALUMINUM DOOR/FRAME MANUFACTURER.				
2	EA	DOOR POSITION SWITCH	BY DIVISION 28.		~		

HARDWARE IS FOR STOREFRONT SYSTEM WITH 1-3/4" THICK WIDE STILE DOOR

**OPERATION:
EXIT ONLY**

DOOR IS MONITORED THROUGH ACCESS CONTROL OR SECURITY SYSTEM

HARDWARE GROUP NO. A07

FOR USE ON DOOR #(S):

F103B							
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PROVIDE EACH DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER			FINISH	MFR
2	EA	CONT. HINGE	112XY	<input type="checkbox"/>		628	IVE
2	EA	DUMMY PUSH BAR	350-DT-990	<input type="checkbox"/>		626	VON
2	EA	OH STOP	100S ADJ	<input type="checkbox"/>		630	GLY
1	EA	SURFACE CLOSER	4040XP EDAW/62G	<input type="checkbox"/>		689	LCN
1	EA	DROP PLATE	PROVIDE AS NECESSARY			689	
1	EA	SURF. AUTO OPERATOR	4642 WMS 120 VAC	<input type="checkbox"/>	~	689	LCN
1	EA	CUSH SHOE SUPPORT	4040XP-30 SRT	<input type="checkbox"/>		689	LCN
2	EA	ACTUATOR, TOUCHLESS	8310-810D	<input type="checkbox"/>		630	LCN
1	EA	WEATHERSTRIPPING	BY ALUMINUM DOOR/FRAME MANUFACTURER.				

1	EA	THRESHOLD	BY ALUMINUM DOOR/FRAME MANUFACTURER.				
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HARDWARE IS FOR STOREFRONT SYSTEM WITH 1-3/4" THICK WIDE STILE DOOR

OPERATION:

ACTUATOR IS CONTROLLED BY OPERATOR

HARDWARE GROUP NO. A08

FOR USE ON DOOR #(S):

C104C							
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PROVIDE EACH DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER			FINISH	MFR
1	EA	CONT. HINGE	112XY EPT	<input type="checkbox"/>		628	IVE
1	EA	POWER TRANSFER	EPT10 CON	<input type="checkbox"/>	~	689	VON
1	EA	ELEC PANIC HARDWARE	LX-RX-QEL-98-NL-1439-CON 24 VDC	<input type="checkbox"/>	~	626	VON
1	EA	FSIC RIM CYL. HOUSING	20-079	<input type="checkbox"/>		626	SCH
1	EA	PRIMUS CORE	20-740-XP	<input type="checkbox"/>		626	SCH
1	EA	OH STOP	100S ADJ	<input type="checkbox"/>		630	GLY
1	EA	SURF. AUTO OPERATOR	4642 WMS 120 VAC	<input type="checkbox"/>	~	689	LCN
1	EA	WEATHER RING	8310-801	<input type="checkbox"/>			LCN
2	EA	ACTUATOR, TOUCHLESS	8310-810D	<input type="checkbox"/>		630	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	WIRE HARNESS (FROM DEVICE TO HINGE)	CON-XXXP (LENGTH TO SUIT) VERIFY LENGTH		~		SCH
1	EA	POWER SUPPLY WIRE HARNESS	CON-6W		~		SCH
1	EA	CREDENTIAL READER	BY DIVISION 28.		~		
1	EA	DOOR POSITION SWITCH	BY DIVISION 28.		~		
1	EA	LOW VOLTAGE POWER	BY LOW VOLTAGE.		~		

HARDWARE IS FOR STOREFRONT SYSTEM WITH 1-3/4" THICK WIDE STILE DOOR

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

EXTERIOR ACTURATOR IS CONTROLLED BY ACCESS CONTROL SYSTEM; INTERIOR ACTUATOR IS ALWAYS ACTIVE

DOOR IS MONITORED THROUGH ACCESS CONTROL OR SECURITY SYSTEM

DOOR IS SECURED UPON LOSS OF POWER TO THE DEVICE

FREE EGRESS AT ALL TIMES

HARDWARE GROUP NO. A09

FOR USE ON DOOR #(S):

C104A	C104B					
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PROVIDE EACH DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER			FINISH	MFR
1	EA	CONT. HINGE	112XY EPT	<input type="checkbox"/>		628	IVE
1	EA	POWER TRANSFER	EPT10 CON	<input type="checkbox"/>	~	689	VON
1	EA	ELEC PANIC HARDWARE	RX-QEL-98-DT-1439-CON 24 VDC	<input type="checkbox"/>	~	626	VON
1	EA	OH STOP	100S ADJ	<input type="checkbox"/>		630	GLY
1	EA	SURFACE CLOSER	4040XP EDAW/62G	<input type="checkbox"/>		689	LCN
1	EA	DROP PLATE	PROVIDE AS NECESSARY			689	
1	EA	CUSH SHOE SUPPORT	4040XP-30 SRT	<input type="checkbox"/>		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	WIRE HARNESS (FROM DEVICE TO HINGE)	CON-XXXP (LENGTH TO SUIT) VERIFY LENGTH		~		SCH
1	EA	POWER SUPPLY WIRE HARNESS	CON-6W		~		SCH
1	EA	DOOR POSITION SWITCH	BY DIVISION 28.		~		
1	EA	LOW VOLTAGE POWER	BY LOW VOLTAGE.		~		

**REFERENCE CARD READER AT DOOR #C104C
HARDWARE IS FOR STOREFRONT SYSTEM WITH 1-3/4" THICK WIDE STILE DOOR**

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 MONITORED THROUGH ACCESS CONTROL OR SECURITY SYSTEM
DOOR IS SECURED UPON LOSS OF POWER TO THE DEVICE
FREE EGRESS AT ALL TIMES**

HARDWARE GROUP NO. A10

FOR USE ON DOOR #(S):

C115C					
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PROVIDE EACH DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
1	EA	CONT. HINGE	112XY	<input type="checkbox"/>	628	IVE
1	EA	PANIC HARDWARE	LD-98-EO-1439	<input type="checkbox"/>	626	VON
1	EA	OH STOP	100S ADJ	<input type="checkbox"/>	630	GLY
1	EA	SURFACE CLOSER	4040XP EDAW/62G	<input type="checkbox"/>	689	LCN
1	EA	DROP PLATE	PROVIDE AS NECESSARY		689	
1	EA	CUSH SHOE SUPPORT	4040XP-30 SRT	<input type="checkbox"/>	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.		~	

HARDWARE IS FOR STOREFRONT SYSTEM WITH 1-3/4" THICK WIDE STILE DOOR

OPERATION:

DOOR IS MONITORED THROUGH ACCESS CONTROL OR SECURITY SYSTEM

HARDWARE GROUP NO. A11

FOR USE ON DOOR #(S):

E111B					
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PROVIDE EACH DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
1	EA	CONT. HINGE	112XY	<input type="checkbox"/>	628	IVE
1	EA	INSTITUTION LOCK	ND82P6D RHO	<input type="checkbox"/>	626	SCH

1	EA	ELECTRIC STRIKE	7440 FSE 12/24VDC	<input type="checkbox"/>	~	630	ADA
1	EA	OH STOP	100S ADJ	<input type="checkbox"/>		630	GLY
1	EA	SURF. AUTO OPERATOR	4642 WMS 120 VAC	<input type="checkbox"/>	~	689	LCN
2	EA	ACTUATOR, TOUCHLESS	8310-810D	<input type="checkbox"/>		630	LCN
1	EA	WEATHERSTRIPPING	BY ALUMINUM DOOR/FRAME MANUFACTURER.				
1	EA	THRESHOLD	BY ALUMINUM DOOR/FRAME MANUFACTURER.				
2	EA	CREDENTIAL READER	BY DIVISION 28.		~		
1	EA	REMOTE RELEASE BUTTON	BY DIVISION 28.		~		
1	EA	LOW VOLTAGE POWER	BY LOW VOLTAGE.		~		

HARDWARE IS FOR STOREFRONT SYSTEM WITH 1-3/4" THICK WIDE STILE DOOR

OPERATION:

DOOR IS NORMALLY LATCHED AND SECURED AT BOTH SIDES OF THE DOOR PRESENTING VALID CREDENTIAL FROM EITHER SIDE OF THE DOOR, OR PUSHING RELEASE BUTTON FROM OFFICE RELEASES STRIKE FOR ENTRY OR EXIT ACTUATOR IS CONTROLLED THROUGH ACCESS CONTROL SYSTEM DOOR IS SECURED UPON LOSS OF POWER TO THE STRIKE

HARDWARE GROUP NO. A12

FOR USE ON DOOR #(S):

E107	E111A				
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PROVIDE EACH DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER			FINISH	MFR
1	EA	CONT. HINGE	112XY	<input type="checkbox"/>		628	IVE
1	EA	STOREROOM LOCK	ND80P6D RHO	<input type="checkbox"/>		626	SCH
1	EA	ELECTRIC STRIKE	7440 FSE 12/24VDC	<input type="checkbox"/>	~	630	ADA
1	EA	OH STOP	100S ADJ	<input type="checkbox"/>		630	GLY
1	EA	SURFACE CLOSER	4040XP EDAW/62G	<input type="checkbox"/>		689	LCN
1	EA	DROP PLATE	PROVIDE AS NECESSARY			689	
1	EA	CUSH SHOE SUPPORT	4040XP-30 SRT	<input type="checkbox"/>		689	LCN
1	EA	WEATHERSTRIPPING	BY ALUMINUM DOOR/FRAME MANUFACTURER.				
1	EA	THRESHOLD	BY ALUMINUM DOOR/FRAME				

			MANUFACTURER.				
1	EA	CREDENTIAL READER	BY DIVISION 28.		~		
1	EA	REMOTE RELEASE BUTTON	BY DIVISION 28.		~		
1	EA	LOW VOLTAGE POWER	BY LOW VOLTAGE.		~		

**VERIFY ACCESS CONTROL/HARDWARE FUNCTION
HARDWARE IS FOR STOREFRONT SYSTEM WITH 1-3/4" THICK WIDE STILE DOOR**

OPERATION:

**DOOR IS NORMALLY LATCHED AND SECURED
PRESENTING VALID CREDENTIAL, OR PUSHING RELEASE BUTTON FROM OFFICE RELEASES
STRIKE FOR ENTRY
DOOR IS SECURED UPON LOSS OF POWER TO THE STRIKE
FREE EGRESS AT ALL TIMES**

HARDWARE GROUP NO. A13

FOR USE ON DOOR #(S):

E108							
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PROVIDE EACH DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
1	EA	CONT. HINGE	112XY	<input type="checkbox"/>	628	IVE
1	EA	PASSAGE SET	ND10S RHO	<input type="checkbox"/>	626	SCH
1	EA	WALL STOP	WS401/402CVX	<input type="checkbox"/>	626	IVE
1	EA	WEATHERSTRIPPING	BY ALUMINUM DOOR/FRAME MANUFACTURER.			

**VERIFY HARDWARE FUNCTION
HARDWARE IS FOR STOREFRONT SYSTEM WITH 1-3/4" THICK WIDE STILE DOOR**

HARDWARE GROUP NO. A14

FOR USE ON DOOR #(S):

C104D	C104E	E124A					
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PROVIDE EACH DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
1	EA	CONT. HINGE	112XY	<input type="checkbox"/>	628	IVE
1	EA	DUMMY PUSH BAR	350-DT-990	<input type="checkbox"/>	626	VON
1	EA	OH STOP	100S ADJ	<input type="checkbox"/>	630	GLY
1	EA	SURFACE CLOSER	4040XP EDAW/62G	<input type="checkbox"/>	689	LCN
1	EA	DROP PLATE	PROVIDE AS NECESSARY		689	
1	EA	CUSH SHOE SUPPORT	4040XP-30 SRT	<input type="checkbox"/>	689	LCN
1	EA	WEATHERSTRIPPING	BY ALUMINUM DOOR/FRAME MANUFACTURER.			

1	EA	THRESHOLD	BY ALUMINUM DOOR/FRAME MANUFACTURER.				
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HARDWARE IS FOR STOREFRONT SYSTEM WITH 1-3/4" THICK WIDE STILE DOOR

HARDWARE GROUP NO. A15

FOR USE ON DOOR #(S):

C104F							
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PROVIDE EACH DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER			FINISH	MFR
1	EA	CONT. HINGE	112XY	<input type="checkbox"/>		628	IVE
1	EA	DUMMY PUSH BAR	350-DT-990	<input type="checkbox"/>		626	VON
1	EA	OH STOP	100S ADJ	<input type="checkbox"/>		630	GLY
1	EA	SURF. AUTO OPERATOR	4642 WMS 120 VAC	<input type="checkbox"/>	~	689	LCN
2	EA	ACTUATOR, TOUCHLESS	8310-810D	<input type="checkbox"/>		630	LCN
1	EA	WEATHERSTRIPPING	BY ALUMINUM DOOR/FRAME MANUFACTURER.				
1	EA	THRESHOLD	BY ALUMINUM DOOR/FRAME MANUFACTURER.				

HARDWARE IS FOR STOREFRONT SYSTEM WITH 1-3/4" THICK WIDE STILE DOOR

OPERATION:

ACTUATOR IS CONTROLLED BY OPERATOR

HARDWARE GROUP NO. A16

FOR USE ON DOOR #(S):

A104B	A109B	F101B	F103D				
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PROVIDE EACH DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER			FINISH	MFR
2	EA	CONT. HINGE	112XY	<input type="checkbox"/>		628	IVE
2	EA	DUMMY PUSH BAR	350-DT-990	<input type="checkbox"/>		626	VON
2	EA	OH STOP	100S ADJ	<input type="checkbox"/>		630	GLY
2	EA	SURFACE CLOSER	4040XP EDAW/62G	<input type="checkbox"/>		689	LCN
2	EA	DROP PLATE	PROVIDE AS NECESSARY			689	
2	EA	CUSH SHOE SUPPORT	4040XP-30 SRT	<input type="checkbox"/>		689	LCN
1	EA	WEATHERSTRIPPING	BY ALUMINUM DOOR/FRAME MANUFACTURER.				
1	EA	THRESHOLD	BY ALUMINUM DOOR/FRAME MANUFACTURER.				

HARDWARE IS FOR STOREFRONT SYSTEM WITH 1-3/4" THICK WIDE STILE DOOR

HARDWARE GROUP NO. A17

FOR USE ON DOOR #(S):

C115A					
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PROVIDE EACH DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
2	EA	CONT. HINGE	112XY	<input type="checkbox"/>	628	IVE
1	EA	PANIC HARDWARE	LD-9849-EO-LBL	<input type="checkbox"/>	626	VON
1	EA	PANIC HARDWARE - CLASSROOM SECURITY W/INDICATOR	LD-9849-L-2SI-06-LBL	<input type="checkbox"/>	626	VON
1	EA	RIM CYLINDER	20-021 (FOR INSIDE CYLINDER)	<input type="checkbox"/>	626	SCH
1	EA	RIM CYLINDER	20-022	<input type="checkbox"/>	626	SCH
2	EA	OH STOP	100S ADJ	<input type="checkbox"/>	630	GLY
2	EA	SURFACE CLOSER	4040XP EDAW/62G	<input type="checkbox"/>	689	LCN
2	EA	DROP PLATE	PROVIDE AS NECESSARY		689	
2	EA	CUSH SHOE SUPPORT	4040XP-30 SRT	<input type="checkbox"/>	689	LCN
1	EA	WEATHERSTRIPPING	BY ALUMINUM DOOR/FRAME MANUFACTURER.			

HARDWARE IS FOR STOREFRONT SYSTEM WITH 1-3/4" THICK WIDE STILE DOOR

HARDWARE GROUP NO. A18

FOR USE ON DOOR #(S):

D101A	D101E				
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PROVIDE EACH DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER		FINISH	MFR
2	EA	CONT. HINGE	112XY	<input type="checkbox"/>	628	IVE
1	EA	PANIC HARDWARE	CDSI-9849-DT-LBL	<input type="checkbox"/>	626	VON
1	EA	PANIC HARDWARE	CDSI-9849-NL-LBL	<input type="checkbox"/>	626	VON
2	EA	MORTISE CYLINDER	20-002 X XQ11-949		626	SCH
1	EA	RIM CYLINDER	20-022	<input type="checkbox"/>	626	SCH
2	EA	OH STOP	100S ADJ	<input type="checkbox"/>	630	GLY
2	EA	SURFACE CLOSER	4040XP EDAW/62G	<input type="checkbox"/>	689	LCN
2	EA	DROP PLATE	PROVIDE AS NECESSARY		689	

2	EA	CUSH SHOE SUPPORT	4040XP-30 SRT	<input type="checkbox"/>		689	LCN
1	EA	WEATHERSTRIPPING	DOOR/FRAME MANUFACTURER.				

**HARDWARE IS FOR STOREFRONT SYSTEM WITH 1-3/4" THICK WIDE STILE DOOR
HARDWARE GROUP NO. A19**

FOR USE ON DOOR #(S):

E124B							
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PROVIDE EACH DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER			FINISH	MFR
1	EA	CONT. HINGE	112XY EPT	<input type="checkbox"/>		628	IVE
1	EA	POWER TRANSFER	EPT10 CON	<input type="checkbox"/>	~	689	VON
1	EA	ELEC PANIC HARDWARE	RX-QEL-98-EO-1439-CON 24 VDC	<input type="checkbox"/>	~	626	VON
1	EA	OH STOP	100S ADJ	<input type="checkbox"/>		630	GLY
1	EA	SURFACE CLOSER	4040XP EDAW/62G	<input type="checkbox"/>		689	LCN
1	EA	DROP PLATE	PROVIDE AS NECESSARY			689	
1	EA	CUSH SHOE SUPPORT	4040XP-30 SRT	<input type="checkbox"/>		689	LCN
1	EA	WEATHERSTRIPPING	DOOR/FRAME MANUFACTURER.				
1	EA	DOOR SWEEP	DOOR/FRAME MANUFACTURER.				
1	EA	THRESHOLD	DOOR/FRAME MANUFACTURER.				
1	EA	WIRE HARNESS (FROM DEVICE TO HINGE)	CON-XXXP (LENGTH TO SUIT) VERIFY LENGTH		~		SCH
1	EA	POWER SUPPLY WIRE HARNESS	CON-6W		~		SCH
1	EA	CREDENTIAL READER	BY DIVISION 28.		~		
1	EA	DOOR POSITION SWITCH	BY DIVISION 28.		~		
1	EA	LOW VOLTAGE POWER	BY LOW VOLTAGE.		~		

HARDWARE IS FOR STOREFRONT SYSTEM WITH 1-3/4" THICK WIDE STILE DOOR

OPERATION:

DOOR IS NORMALLY LATCHED AND SECURED

PRESENTING VALID CREDENTIAL TEMPORALLY RETRACTS LATCHBOLT FOR ENTRY

DOOR IS MONITORED THROUGH ACCESS CONTROL OR SECURITY SYSTEM

DOOR IS SECURED UPON LOSS OF POWER TO THE DEVICE

FREE EGRESS AT ALL TIMES

END OF SECTION 08 7100

**SECTION 08 8000
GLAZING**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Insulating glass units.
- B. Glazing units.
- C. Glazing compounds.

1.02 RELATED REQUIREMENTS

- A. Section 07 2500 - Weather Barriers.
- B. Section 07 9200 - Joint Sealants: Sealants for other than glazing purposes.
- C. Section 08 1113 - Hollow Metal Doors and Frames: Glazed lites in doors and borrowed lites.
- D. Section 08 1416 - Flush Wood Doors: Glazed lites in doors.
- E. Section 08 3200 - Sliding Glass Doors: Glazing provided by door manufacturer.
- F. Section 08 4229 - Automatic Entrances: Glazing provided as part of door assembly.
- G. Section 08 4313 - Aluminum-Framed Storefronts: Glazing provided as part of storefront assembly.
- H. Section 10 2800 - Toilet, Bath, and Laundry Accessories: Mirrors.

1.03 REFERENCE STANDARDS

- A. 16 CFR 1201 - Safety Standard for Architectural Glazing Materials; Current Edition.
- B. ANSI Z97.1 - American National Standard for Safety Glazing Materials Used in Buildings - Safety Performance Specifications and Methods of Test; 2015 (Reaffirmed 2020).
- C. ASCE 7 - Minimum Design Loads and Associated Criteria for Buildings and Other Structures; Most Recent Edition Cited by Referring Code or Reference Standard.
- D. ASTM C864 - Standard Specification for Dense Elastomeric Compression Seal Gaskets, Setting Blocks, and Spacers; 2005 (Reapproved 2019).
- E. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2018.
- 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 C1193 - Standard Guide for Use of Joint Sealants; 2016 (Reapproved 2023).
- I. ASTM C1376 - Standard Specification for Pyrolytic and Vacuum Deposition Coatings on Flat Glass; 2021a.
- J. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2023d.
- 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 (SM) - GANA Sealant Manual; 2008.
- N. ITS (DIR) - Directory of Listed Products; Current Edition.
- O. NFRC 100 - Procedure for Determining Fenestration Product U-factors; 2023.
- P. NFRC 200 - Procedure for Determining Fenestration Product Solar Heat Gain Coefficient and Visible Transmittance at Normal Incidence; 2023.
- Q. NFRC 300 - Test Method for Determining the Solar Optical Properties of Glazing Materials and Systems; 2023.

- R. UL (DIR) - Online Certifications Directory; Current Edition.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Preinstallation Meeting: Convene a preinstallation meeting one week before starting work of this section; require attendance by each of the affected installers.

1.05 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Product Data on Insulating Glass Unit, Glazing Unit, and Plastic Film 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 one samples 12 by 12 inch in size of glass units, showing coloration.
- E. Samples: Submit 2 inch long bead of glazing sealant, color as selected.
- F. Certificate: Certify that products of this section meet or exceed specified requirements.
- G. Warranty Documentation: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

1.06 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years of documented experience.
- B. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years documented experience.

1.07 FIELD CONDITIONS

- A. Do not install glazing when ambient temperature is less than 40 degrees F.
- B. Maintain minimum ambient temperature before, during and 24 hours after installation of glazing compounds.

1.08 WARRANTY

- A. See Section 01 7800 - Closeout Submittals for additional warranty requirements.
- B. Insulating Glass Units: Provide a five (5) year manufacturer warranty to include coverage for seal failure, interpane dusting or misting, including providing products to replace failed units.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Float Glass Manufacturers:
 - 1. Guardian Glass, LLC; _____: www.guardianglass.com/#sle.
 - 2. Pilkington North America Inc; _____: www.pilkington.com/na/#sle.
 - 3. Vitro Architectural Glass (formerly PPG Glass): www.vitroglazings.com/#sle.
- B. Mirrored Glass Manufacturers:
 - 1. Pilkington North America Inc; Pilkington Mirropane Transparent Mirror: www.pilkington.com/na/#sle.
 - 2. 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 1/175 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:
 - a. Water-Resistive Barriers: See Section 07 2500.
 2. 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.

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. Thicknesses: As indicated; provide greater thickness as required for exterior glazing wind load design.

2.04 INSULATING GLASS UNITS

- A. Manufacturers:
1. Glass: Any of the manufacturers specified for float glass.
- B. Insulating Glass Units: Types as indicated.
1. Durability: Certified by an independent testing agency to comply with ASTM E2190.
 2. Coated Glass: Comply with requirements of ASTM C1376 for pyrolytic (hard-coat) or magnetic sputter vapor deposition (soft-coat) type coatings on flat glass; coated vision glass, Kind CV; coated overhead glass, Kind CO; or coated spandrel glass, Kind CS.
 3. Metal-Edge Spacers: Aluminum, bent and soldered corners.
 4. Spacer Color: Bronze.
 5. Edge Seal:
 - a. Dual-Sealed System: Provide polyisobutylene sealant as primary seal applied between spacer and glass panes, and silicone, polysulfide, or polyurethane sealant as secondary seal applied around perimeter.
 6. Color: Black.
 7. Purge interpane space with dry air, hermetically sealed.
 8. Capillary Tubes: Provide tubes from air space for insulating glass units without inert type gas that have a change of altitude greater than 2500 feet between point of fabrication and point of installation to permit pressure equalization of air space.
 - a. Breather Tubes: Seal or crimp breather tubes upon installation in accordance with insulating glass fabricator's requirements.
 - b. Inert gas may be installed in the field into air space in accordance with insulating glass fabricator's and installer's requirements.
- C. Type IG-1 - Insulating Glass Units: Vision glass, double glazed.

1. Applications: Exterior glazing unless otherwise indicated.
 2. Space between lites filled with air.
 3. Outboard Lite: Annealed float glass, 1/4 inch thick, minimum.
 - a. Tint: Clear.
 - b. Coating: Self-cleaning type, on #1 surface.
 - c. Coating: Low-E (passive type), on #2 surface.
 4. Inboard Lite: Annealed float glass, 1/4 inch thick, minimum.
 - a. Tint: Clear.
 5. Total Thickness: 1 inch.
 6. Thermal Transmittance (U-Value), Summer - Center of Glass: 26, nominal.
 7. Visible Light Transmittance (VLT): 32% to 64% percent, nominal.
 8. Solar Heat Gain Coefficient (SHGC): 0.19 to 0.27, nominal.
- D. Type IG-3 - Insulating Glass Units: Spandrel glazing.
1. Applications: Exterior spandrel glazing unless otherwise indicated.
 2. Space between lites filled with air.
 3. Outboard Lite: Annealed float glass, 1/4 inch thick, minimum.
 - a. Tint: Clear.
 - b. Coating: Same as on vision units, on #2 surface.
 4. Inboard Lite: Heat-strengthened float glass, 1/4 inch thick.
 - a. Tint: Clear.
 5. Total Thickness: 1 inch.
 6. Thermal Transmittance (U-Value), Summer - Center of Glass: _____, nominal.
- E. Type IG-5 - Insulating Glass Units: Safety glazing.
1. Applications:
 - a. Glazed lites in exterior doors.
 - b. Glazed sidelights and panels next to doors.
 - c. Other locations required by applicable federal, state, and local codes and regulations.
 - d. Other locations indicated on drawings.
 2. Space between lites filled with air.
 3. Glass Type: Same as Type IG-1 except use fully tempered float glass for both outboard and inboard lites.
 4. Tint: Clear.
 5. Total Thickness: 1 inch.
 6. Thermal Transmittance (U-Value), Summer - Center of Glass: 26, nominal.
 7. Visible Light Transmittance (VLT): 32% to 64% percent, nominal.
 8. Solar Heat Gain Coefficient (SHGC): 0.19 to 0.27, nominal.
 9. Visible Light Reflectance, Outside: 64 percent, nominal.
- F. Type IG-6 - Insulating Glass Units: Obscured glass and Vision glass, double glazed.
1. Applications: Exterior glazing unless otherwise indicated. To be installed at exterior windows of toilet rooms and locker rooms.
 2. Space between lites filled with air.
 3. Outboard Lite: Annealed float glass, 1/4 inch thick, minimum.
 - a. Tint: Clear.
 - b. Coating: Self-cleaning type, on #1 surface.
 - c. Coating: Low-E (passive type), on #2 surface.
 4. Inboard Lite: Obscured float glass, 1/4 inch thick, minimum.
 - a. Tint: Clear.
 5. Total Thickness: 1 inch.
 6. Thermal Transmittance (U-Value), Summer - Center of Glass: 26, nominal.
 7. Visible Light Transmittance (VLT): 32% to 64% percent, nominal.
 8. Solar Heat Gain Coefficient (SHGC): 0.19 to 0.27, nominal.

2.05 BASIS OF DESIGN - INSULATING GLASS UNITS

- A. Basis of Design - Insulating Glass Units: Vision glazing, with low-e coating.

1. Applications: Exterior insulating glass glazing unless otherwise indicated.
2. Space between lites filled with air.
3. Total Thickness: 1 inch.
4. Visible Light Transmittance (VLT): 32% to 64% percent, nominal.
5. Solar Heat Gain Coefficient (SHGC): 0.19 to 0.27, nominal.
6. Visible Light Reflectance, Outside: 64 percent, nominal.
7. Glazing Method: Dry glazing method, gasket glazing.
8. 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.
9. Spacer Color: Black.
10. Edge Seal:
11. Color: Black.
12. Purge interpane space with dry air, hermetically sealed.
13. Basis of Design - Vitro Architectural Glass (formerly PPG Glass):
www.vitroglazings.com/#sle.
14. Outboard Lite: Annealed float glass, 1/4 inch thick, minimum.
 - a. Low-E Coating: Vitro Architectural Glass (formerly PPG Glass) Solarban 70 glass on #2 surface.
 - b. Glass: Clear.
 - c. Glass Tint: Grey. Prior to fabrication submit samples to Architect for color selection.
 - 1) Locations as indicated on drawings.
15. Inboard Lite: Heat-strengthened float glass, 1/4 inch thick.
16. Other Manufacturers: Provide either the product identified as "Basis of Design" or an equivalent product of another acceptable manufacturer.
17. Substitution Procedures: See Section 01 6000 - Product Requirements.

2.06 GLAZING UNITS

- A. Type G-2 - Monolithic Interior Vision Glazing:
 1. Applications: Interior glazing unless otherwise indicated.
 2. Glass Type: Annealed float glass.
 3. Tint: Clear.
 4. Thickness: 1/4 inch, nominal.
- B. Type G-3 - Monolithic Safety Glazing: Non-fire-rated.
 1. Applications:
 - a. Glazed lites in doors, except fire doors.
 - b. Glazed sidelights to doors, except in fire-rated walls and partitions.
 - c. Other locations required by applicable federal, state, and local codes and regulations.
 - d. Other locations indicated on drawings.
 2. Glass Type: Fully tempered safety glass as specified.
 3. Tint: Clear.
 4. Thickness: 1/4 inch, nominal.
 5. Manufacturers:
 - a. Capital Glass; www.capitolglassco.com.
 - b. Substitutions: See Section 01 6000 - Product Requirements.
- C. Type M-1 - Transparent One-Way Mirror: Mirror quality float glass with pyrolytic (hard coat) type coating located on high light level surface of glass; ASTM C1376.
 1. Applications: Locations as indicated on drawings.
 2. Thickness: 1/4 inch.
 3. Glass Tint: Grey.
 4. Glass Type: Fully tempered.
 5. Manufacturers:
 - a. Pilkington North America Inc; Pilkington Mirropane Transparent Mirror:
www.pilkington.com/na/#sle.

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

2.07 GLAZING COMPOUNDS

- A. Type GC-2 - Butyl Sealant: Single component; ASTM C920 Grade NS, Class 12-1/2, Uses M and A, Shore A hardness of 10 to 20; black color.
- B. Type GC-5 - Silicone Sealant: Single component; neutral curing; capable of water immersion without loss of properties; nonbleeding, nonstaining; ASTM C920 Type S, Grade NS, Class 25, Uses M, A, and G; with cured Shore A hardness range of 15 to 25; _____ color.
- C. Manufacturers:
 - 1. Dow Corning Corporation; _____: www.dowcorning.com/construction/#sle. Dow Corning Corporation; _____: www.dowcorning.com/construction/#sle.
 - 2. Tremco Commercial Sealants & Waterproofing; Proglaze: www.tremcosealants.com/#sle.
 - 3. Substitutions: See Section 01 6000 - Product Requirements.

2.08 ACCESSORIES

- A. Setting Blocks: Silicone, with 80 to 90 Shore A durometer hardness; ASTM C864 Option II. Length of 0.1 inch for each square foot of glazing or minimum 4 inch by width of glazing rabbet space minus 1/16 inch by height to suit glazing method and pane weight and area.
- B. Spacer Shims: Neoprene, 50 to 60 Shore A durometer hardness; ASTM C864 Option II. Continuous by one half the height of the glazing stop by thickness to suit application, self adhesive on one face.
- C. Glazing Tape, Back Bedding Mastic Type: Preformed, butyl-based, 100 percent solids compound with integral resilient spacer rod applicable to application indicated; 5 to 30 cured Shore A durometer hardness; coiled on release paper; black color.
 - 1. Width: As required for application.
 - 2. Thickness: As required for application.
 - 3. Spacer Rod Diameter: As required for application.
- D. Glazing Splines: Resilient silicone extruded shape to suit glazing channel retaining slot; ASTM C864 Option II; color black.
- E. Glazing Clips: Manufacturer's standard type.

PART 3 EXECUTION

3.01 VERIFICATION OF CONDITIONS

- A. Verify that openings for glazing are correctly sized and within tolerances, including those for size, squareness, and offsets at corners.
- B. Verify that surfaces of glazing channels or recesses are clean, free of obstructions that may impede moisture movement, weeps are clear, and support framing is ready to receive glazing system.
- C. Verify that sealing between joints of glass framing members has been completed effectively.

3.02 PREPARATION

- A. Clean contact surfaces with appropriate solvent and wipe dry within maximum of 24 hours before glazing. Remove coatings that are not tightly bonded to substrates.
- B. Seal porous glazing channels or recesses with substrate compatible primer or sealer.
- C. Prime surfaces scheduled to receive sealant where required for proper sealant adhesion.

3.03 INSTALLATION, GENERAL

- A. Install glazing in compliance with written instructions of glass, gaskets, and other glazing material manufacturers, unless more stringent requirements are indicated, including those in glazing referenced standards.
- B. Install glazing sealants in accordance with ASTM C1193, GANA (SM), and manufacturer's instructions.
- C. Set glass lites in proper orientation so that coatings face exterior or interior as indicated.

- D. Prevent glass from contact with any contaminating substances that may be the result of construction operations such as, and not limited to the following; weld splatter, fire-safing, plastering, mortar droppings, and paint.

3.04 INSTALLATION - DRY GLAZING METHOD (GASKET GLAZING)

- A. Application - Exterior and/or Interior Glazed: Set glazing infills from either the exterior or the interior of the building.
- B. Place setting blocks at 1/4 points with edge block no more than 6 inch from corners.
- C. Rest glazing on setting blocks and push against fixed stop with sufficient pressure on gasket to attain full contact.
- D. Install removable stops without displacing glazing gasket; exert pressure for full continuous contact.

3.05 INSTALLATION - 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 1/4 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 _____ type 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 _____ type sealant along void between the stop and the glazing, to uniform line, flush with sight line. Tool or wipe sealant surface smooth.

3.06 INSTALLATION - WET/DRY GLAZING METHOD (TAPE AND SEALANT)

- A. Application - Interior Glazed: Set glazing infills from the interior of the building.
- B. Cut glazing tape to length and install 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 to ensure full contact at perimeter of pane or unit.
- E. Install removable stops, spacer shims inserted between glazing and applied stops at 24 inch intervals, 1/4 inch below sight line.
- F. Fill gaps between pane and applied stop with _____ type sealant to depth equal to bite on glazing, to uniform and level line.
- G. Carefully trim protruding tape with knife.

3.07 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.

3.08 PROTECTION

- A. Remove and replace glass that is damaged during construction period prior to Date of Substantial Completion.

END OF SECTION 08 8000

**SECTION 08 8300
MIRRORS**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Glass mirrors.
 - 1. Annealed float glass.

1.02 REFERENCE STANDARDS

- A. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2018.
- B. ASTM C1036 - Standard Specification for Flat Glass; 2021.
- C. ASTM C1048 - Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass; 2018.
- D. ASTM C1193 - Standard Guide for Use of Joint Sealants; 2016 (Reapproved 2023).
- E. ASTM C1503 - Standard Specification for Silvered Flat Glass Mirror; 2024.

1.03 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.

1.04 QUALITY ASSURANCE

- A. Fabricate, store, transport, receive, install, and clean mirrors in accordance with manufacturer's recommendations.

1.05 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.

1.06 WARRANTY

- A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
- B. Provide five year manufacturer warranty for reflective coating on mirrors and replacement of same.

PART 2 PRODUCTS

2.01 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. Mirror Glass: Clear, annealed float glass; ASTM C1036, with copper and silver coatings, and protective overcoating.
 - 1. Thickness: 1/4 inch.
 - 2. Edges: Bevelled.
 - 3. Size: As indicated on drawings.

2.02 GLAZING COMPOUNDS

- A. Polysulfide Sealant: ASTM C920, Type M, Grade NS, Class 25, Uses M and A ; two component; chemical curing, non-sagging type; cured Shore A hardness of 15 to 25; color as selected.

2.03 ACCESSORIES

- A. Mirror Attachment Accessories: Stainless steel clips.
- B. Mirror Adhesive: Silicone pre-polymer based, chemically compatible with mirror coating and wall substrate.

1. Volatile Organic Content (VOC): Less than 7 percent by weight.

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 manufacturer's 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. Frameless Mirrors: Set mirrors in proper place with adhesive, applied in accordance with adhesive manufacturer's instructions.
- E. Weight Room
 1. Install mirrors butt joined (frameless installation) to provide a continuous array.

3.04 CLEANING

- A. Remove wet glazing materials from finish surfaces.
- B. Remove labels after work is complete.
- C. Clean mirrors and adjacent surfaces.

END OF SECTION 08 8300

**SECTION 08 8723
SAFETY AND SECURITY FILMS**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Glazing film applied to new glazing assemblies.
- B. Glazing assemblies to receive film are indicated on drawings.

1.02 RELATED REQUIREMENTS

- A. Section 08 4413 - Glazed Aluminum Curtain Walls: New glazing to receive film.
- B. Section 08 5113 - Aluminum Windows: New windows to receive film.
- C. Section 08 8000 - Glazing: New glazing to received film.

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. ASTM D882 - Standard Test Method for Tensile Properties of Thin Plastic Sheeting; 2018.
- D. GSA TS01 - Standard Test Method for Glazing and Window Systems Subject to Dynamic Overpressure Loadings; General Services Administration; 2003.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
 - 1. Record of product certification for safety requirements.
 - 2. Preparation instructions and recommendations.
 - 3. Storage and handling requirements and recommendations.
 - 4. Installation methods.
- C. Samples: For each film product to be used, minimum size 4 inches by 6 inches, representing actual product, color, and patterns.
- D. Test Reports: Detailed reports of full-scale chamber tests to specified criteria, using assemblies identical to those required for this project.
- E. Specimen Warranty.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Glazing film manufacturer specializing in manufacture of safety glazing films with minimum 10 years successful experience.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's unopened packaging until ready for installation.
- B. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of authorities having jurisdiction.

1.07 FIELD CONDITIONS

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

1.08 WARRANTY

- A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
- B. Provide 10 year manufacturer's replacement warranty to cover film against peeling, cracking, discoloration, and deterioration.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. 3M Window Film; Ultra 800: www.solutions.3m.com/#sle.
- B. Substitutions: See Section 01 6000 - Product Requirements.

2.02 SAFETY AND SECURITY GLAZING FILM

- A. Blast Resistant Glazing at 8 Feet Above Ground Level and Higher: Provide new glazing assemblies to provide forced entry resistance.
 - 1. Surface applied film.
 - 2. Supplemental anchoring devices, applied to 4 sides of opening.

2.03 MATERIALS

- A. Glazing Film:
 - 1. Transparent polyester film for permanent bonding to glass at entries.
 - a. Thickness: 0.008 inch, minimum.
 - b. Color: Clear.
 - c. Construction: Multi-ply laminate.
 - d. Adhesive Type: Pressure sensitive acrylic.
 - 1) Tensile Strength: 31,500 psi minimum when tested in accordance with ASTM D882.
 - 2) Breaking Strength: 253 psi when tested in accordance with ASTM D882.
 - 3) Location: Entry storefront systems, see storefront schedule on drawings.
- B. Supplementary Anchors: As required by performance criteria and acceptable to Architect.
- C. Glass Cleaner: As recommended by glazing film manufacturer.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Examine glass and frames. Verify that existing conditions are adequate for proper application and performance of film.
- B. Verify glass is not cracked, chipped, broken, or damaged.
- C. Verify that frames are securely anchored and free of defects.
- D. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.02 PREPARATION

- A. Clean glass of dust, dirt, paint, oil, grease, mildew, mold, and other contaminants that would inhibit adhesion.
- B. Immediately prior to applying film, thoroughly wash glass with neutral cleaning solution.
- C. Protect adjacent surfaces.
- D. Do not begin installation until substrates have been properly prepared.

3.03 INSTALLATION

- A. Do not apply glazing film when surface temperature is less than 40 degrees F or if precipitation is imminent.
- B. Install in accordance with manufacturer's instructions, without air bubbles, wrinkles, streaks, bands, thin spots, pinholes, or gaps, as required to achieve specified performance.
- C. Accurately cut film with straight edges to required sizes allowing 1/16 inch to 1/8 inch gap at perimeter of glazed panel unless otherwise required by anchorage method.
- D. Seams: Seam film only as required to accommodate material sizes; form seams vertically without overlaps and gaps; do not install with horizontal seams.

- E. Supplemental Anchors: Install in accordance with manufacturer's instructions and shop drawings.
- F. Clean glass and anchoring accessories following installation. Remove excess sealants and other glazing materials from adjacent finished surfaces.
- G. Remove labels and protective covers.

3.04 PROTECTION

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

END OF SECTION 08 8723

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**SECTION 09 2116
GYPSUM BOARD ASSEMBLIES**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Acoustic sound putty packs
- B. Gypsum sheathing.
- C. Gypsum wallboard.

1.02 RELATED REQUIREMENTS

- A. Section 01 6116 - Volatile Organic Compound (VOC) Content Restrictions.
- B. Section 06 1000 - Rough Carpentry: Wood blocking product and execution requirements.
- C. Section 07 2100 - Thermal Insulation: Acoustic insulation.
- D. Section 07 2500 - Weather Barriers: Water-resistive barrier over sheathing.
- E. Section 07 8400 - Firestopping: Top-of-wall assemblies at fire-resistance-rated walls.
- F. Section 07 9200 - Joint Sealants: Sealing acoustical gaps in construction other than gypsum board or plaster work.

1.03 REFERENCE STANDARDS

- A. AISI S100 - North American Specification for the Design of Cold-Formed Steel Structural Members; 2016, with Supplement (2020).
- B. AISI S220 - North American Standard for Cold-Formed Steel Nonstructural Framing; 2020.
- C. AISI S240 - North American Standard for Cold-Formed Steel Structural Framing; 2015, with Errata (2020).
- D. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2023.
- E. ASTM A1003/A1003M - Standard Specification for Steel Sheet, Carbon, Metallic- and Nonmetallic-Coated for Cold-Formed Framing Members; 2015.
- F. ASTM C840 - Standard Specification for Application and Finishing of Gypsum Board; 2023.
- G. ASTM C1177/C1177M - Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing; 2017.
- H. ASTM C1280 - Standard Specification for Application of Exterior Gypsum Panel Products for Use as Sheathing; 2018 (Reapproved 2023).
- I. ASTM C1396/C1396M - Standard Specification for Gypsum Board; 2017.
- J. ASTM C1629/C1629M - Standard Classification for Abuse-Resistant Nondecorated Interior Gypsum Panel Products and Fiber-Reinforced Cement Panels; 2023.
- K. ASTM D3273 - Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber; 2021.
- L. GA-216 - Application and Finishing of Gypsum Panel Products; 2021.
- M. GA-600 - Fire Resistance and Sound Control Design Manual; 2021.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Product Data:
 - 1. 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 five years of experience.

PART 2 PRODUCTS

2.01 METAL FRAMING MATERIALS

- A. Steel Sheet: ASTM A1003/A1003M, subject to the ductility limitations indicated in AISI S220 or equivalent.
- B. Manufacturers - Metal Framing, Connectors, and Accessories:
 - 1. Clarkwestern Dietrich Building Systems LLC; None - N/A: www.clarkdietrich.com/#sle.
 - 2. Jaimes Industries; None - N/A: www.jaimesind.com/#sle.
 - 3. Marino; None - N/A: www.marinoware.com/#sle.
 - 4. Phillips Manufacturing Co; None - N/A: www.phillipsmfg.com/#sle.
 - 5. SCAFco Corporation; None - N/A: www.scafco.com/#sle.
 - 6. Steel Construction Systems; None - N/A: www.steelconsystems.com/#sle.
 - 7. Substitutions: See Section 01 6000 - Product Requirements.
- C. Partition Head to Structure Connections: Provide mechanical anchorage devices that accommodate deflection and prevent rotation of studs while maintaining structural performance of partition.
 - 1. Structural Performance: Maintain lateral load resistance and vertical movement capacity required by applicable code, when evaluated in accordance with AISI S100.
 - 2. Material: ASTM A653/A653M steel sheet, SS Grade 50/340, with G60/Z180 hot-dipped galvanized coating.
 - 3. Provide components as listed in ICC Evaluation Service for use in ESR-1042 fire-rated and sound rated at head of partition joint systems indicated on drawings.
 - 4. Deflection, Sound, and Firestop Track:
 - a. Provide mechanical anchorage devices as described above that accommodate deflection while maintaining the fire-rating of the wall assembly.

2.02 BOARD MATERIALS

- A. Manufacturers - Gypsum-Based Board:
 - 1. American Gypsum Company; None - N/A: www.americangypsum.com/#sle.
 - 2. CertainTeed Corporation; None - N/A: www.certainteed.com/#sle.
 - 3. Continental Building Products; None - N/A: www.continental-bp.com/#sle.
 - 4. Georgia-Pacific Gypsum; None - N/A: www.gpgypsum.com/#sle.
 - 5. National Gypsum Company; None - N/A: www.nationalgypsum.com/#sle.
 - 6. PABCO Gypsum; None - N/A: www.pabco gypsum.com/#sle.
 - 7. USG Corporation; None - N/A: www.usg.com/#sle.
 - 8. Substitutions: See Section 01 6000 - Product Requirements.
- B. Impact Resistant Wallboard:
 - 1. Application: Install at wood and metal shops, drama, and weight room.
 - 2. Surface Abrasion: Level 3, minimum, when tested in accordance with ASTM C1629/C1629M.
 - 3. Indentation: Level 1, minimum, when tested in accordance with ASTM C1629/C1629M.
 - 4. Soft Body Impact: Level 3, minimum, when tested in accordance with ASTM C1629/C1629M.
 - 5. Hard Body Impact: Level 2, minimum, when tested in accordance with ASTM C1629/C1629M.
 - 6. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
 - 7. Type: Fire-resistance-rated Type X, UL or WH listed.
 - 8. Thickness: 5/8 inch.
 - 9. Edges: Tapered.
- C. 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: at all window jambs and sills, restrooms, and within 2 feet of all plumbing fixtures including drinking fountains or electric water coolers.
 - 2. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.

3. At Assemblies Indicated with Fire-Resistance Rating: Use type required by indicated tested assembly; if no tested assembly is indicated, use Type X board, UL or WH listed.
 4. Type X Thickness: 5/8 inch.
 5. Edges: Tapered.
 6. Products:
 - a. Gold Bond Building Products, LLC provided by National Gypsum Company; Gold Bond XP Fire-Shield Gypsum Board: www.goldbondbuilding.com/#sle.
 - b. Substitutions: See Section 01 6000 - Product Requirements.
- D. Ceiling Board: Special sag resistant gypsum ceiling board as defined in ASTM C1396/C1396M; sizes to minimize joints in place; ends square cut.
1. Application: ceilings in wet areas, unless otherwise indicated.
 2. Thickness: 5/8 inch.
 3. 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: Regular.
 4. Regular Board Thickness: 1/2 inch.
 5. Edges: Square.
- F. Exterior Soffit Board: Exterior gypsum soffit board as defined in ASTM C1396/C1396M; sizes to minimize joints in place; ends square cut.
1. Application: Ceilings and soffits in protected exterior areas, unless otherwise indicated.
 2. Types: Regular, in locations indicated.
 3. Regular Type Thickness: 5/8 inch.
 4. Edges: Tapered.
- G. Roof Cover Board
1. Application: Parapets, unless otherwise indicated.
 2. Type Thickness: 5/8 inch
 3. Products:
 - a. Georgia-Pacific Gypsum; Densdeck Prime, www.gpgypsum.com/#sle.
 - b. Substitutions: See Section 01 6000 - Product Requirements
 4. Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with corrosion- resistance provisions in FM Global 4470, designed for fastening substrate board to roof deck.

2.03 GYPSUM BOARD ACCESSORIES

- A. Acoustic Insulation: ASTM C665; preformed glass fiber, friction fit type, unfaced. Thickness: 3-1/2" inch.
- B. Acoustic Putty Packs installed at back boxes in sound rated walls and at interior of exterior fured walls. Products by 3M, Hilti, or equivalent.
- C. Water-Resistive Barrier: See Section 07 2500.
- D. Beads, Joint Accessories, and Other Trim: ASTM C1047, galvanized steel or rolled zinc, unless noted otherwise.
 1. Corner Beads: Low profile, for 90 degree outside corners.
 2. Expansion Joints:
 - a. Type: V-shaped metal with factory-installed protective tape.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that project conditions are appropriate for work of this section to commence.

3.02 BOARD INSTALLATION

- A. Comply with ASTM C840, GA-216, and manufacturer's instructions. Install to minimize butt end joints, especially in highly visible locations.
- B. Single-Layer Nonrated: Install gypsum board in most economical direction, with ends and edges occurring over firm bearing.
- C. Double-Layer Non-Rated: Use gypsum board for first layer, placed parallel to framing or furring members, with ends and edges occurring over firm bearing. Place second layer perpendicular to framing or furring members. Offset joints of second layer from joints of first layer.
- D. Exposed Gypsum Board in Interior Wet Areas: Seal joints, cut edges, and holes with water-resistant sealant.
- E. Exterior Sheathing: Comply with ASTM C1280. Install sheathing vertically, with edges butted tight and ends occurring over firm bearing.
 - 1. Paper-Faced Sheathing: Immediately after installation, protect from weather by application of water-resistive barrier.
- F. Exterior Soffits: Install exterior soffit board perpendicular to framing, with staggered end joints over framing members or other solid backing.

3.03 INSTALLATION OF TRIM AND ACCESSORIES

- A. Control Joints: Place control joints consistent with lines of building spaces and as indicated.
 - 1. Not more than 30 feet apart on walls and ceilings over 50 feet long.
 - 2. At exterior soffits, not more than 30 feet apart in both directions.
- B. Corner Beads: Install at external corners, using longest practical lengths.
- C. Edge Trim: Install at locations where gypsum board abuts dissimilar materials.

END OF SECTION 09 2116

**SECTION 09 3000
TILING**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Tile for floor applications.
- B. Tile for wall applications.
- C. Tile for counters.
- D. Cementitious backer board as tile substrate.

NOTE: SOME PRODUCTS HAVE LONGER LEAD TIMES. CONTRACTOR SHALL SCHEDULE ACCORDINGLY.

1.02 RELATED REQUIREMENTS

- A. Section 07 9200 - Joint Sealants: Sealing joints between tile work and adjacent construction and fixtures.

1.03 REFERENCE STANDARDS

- A. ANSI A108.11 - American National Standard Specifications for Interior Installation of Cementitious Backer Units; 2018.
- B. 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.
- C. ANSI A118.4 - American National Standard Specifications for Modified Dry-Set Cement Mortar; 2019.
- D. ANSI A118.5 - American National Standard Specifications for Chemical Resistant Furan Mortars and Grouts for Tile Installation; 1999 (Reaffirmed 2021).
- E. ANSI A118.6 - American National Standard Specifications for Standard Cement Grouts for Tile Installation; 2019.
- F. ANSI A118.9 - American National Standard Specifications for Test Methods and Specifications for Cementitious Backer Units; 2019.
- G. ANSI A118.10 - American National Standard Specifications for Load Bearing, Bonded, Waterproof Membranes for Thin-Set Ceramic Tile and Dimension Stone; 2014 (Reaffirmed 2019).
- H. ANSI A118.12 - American National Standard Specifications for Crack Isolation Membranes for Thin-Set Ceramic Tile and Dimension Stone Installation; 2014 (Reaffirmed 2019).
- I. ANSI A137.1 - American National Standard Specifications for Ceramic Tile; 2022.
- J. ASTM C373 - Standard Test Methods for Determination of Water Absorption and Associated Properties by Vacuum Method for Pressed Ceramic Tiles and Glass Tiles and Boil Method for Extruded Ceramic Tiles and Non-tile Fired Ceramic Whiteware Products; 2018 (Reapproved 2023).
- K. TCNA (HB) - Handbook for Ceramic, Glass, and Stone Tile Installation; 2024.

1.04 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, and setting details.
- D. Samples: Mount tile and apply grout on two plywood panels, minimum 18 by 18 inches in size illustrating pattern, color variations, and grout joint size variations.
- E. 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 1 box of each type.

1.05 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.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Protect adhesives from freezing or overheating in accordance with manufacturer's instructions.

1.07 FIELD CONDITIONS

- A. Maintain ambient and substrate temperature above 50 degrees F and below 100 degrees F during installation and curing of setting materials.

PART 2 PRODUCTS

2.01 TILE

- A. Manufacturers: All products by the same manufacturer.
 1. Dal-Tile Corporation: www.daltile.com/#sle.
 2. Dekton: www.dekton.com.
 3. Consentino: www.consentino.com.
 4. Substitutions: See Section 01 6000 - Product Requirements.
- B. Ceramic Mosaic Tile: ANSI A137.1 standard grade.
 1. Moisture Absorption: 0 to 0.5 percent as tested in accordance with ASTM C373.
 2. Size: 2 by 2 inch, nominal.
 3. Shape: Square.
 4. Edges: Cushioned.
 5. Surface Finish: Unglazed.
 6. Color(s): 3 colors installed in a gradient pattern. Colors as indicated on plans.
 7. Trim Units: Matching cove shapes in sizes coordinated with field tile.
- C. Quarry Tile: ANSI A137.1 standard grade.
 1. Moisture Absorption: Over 3.0 but not more than 5.0 percent as tested in accordance with ASTM C373.
 2. Size: 4 by 8 inch, nominal.
 3. Thickness: 1/2 inch, nominal.
 4. Edges: Cushioned.
 5. Surface Finish: Unglazed.
 6. Color(s): As indicated on drawings.
 7. Pattern: As indicated on drawings.
 8. Trim Units: Matching cove base shapes in sizes coordinated with field tile.

2.02 TRIM AND ACCESSORIES

- A. Ceramic Trim: Matching cove base ceramic shapes in sizes coordinated with field tile.
 1. Applications:
 - a. Open Edges: Schluter Jolly.
 - b. Outside Corners: Schluter Quadec
 - c. Inside Corners: Jointed.
 - d. Floor to Wall Joints: Cove base.
 2. Manufacturers: Same as for tile.
- B. Thresholds: Schluter Schiene, Stainless Steel, full width of wall or frame opening; Install schluter so that top is flush with the top of the adjacent finished floor.
 1. Applications:
 - a. At doorways where tile terminates.

- b. At open edges of floor tile where adjacent finish is a different.

2.03 SETTING MATERIALS

- A. Manufacturers:
 1. Custom Building Products; _____: www.custombuildingproducts.com/#sle.
 2. LATICRETE International, Inc; None - N/A: www.laticrete.com/#sle.
 3. MAPEI Corporation; www.mapei.com.
 4. Substitutions: See Section 01 6000 - Product Requirements.
- B. Latex-Portland Cement Mortar Bond Coat: ANSI A118.4.

2.04 GROUTS

- A. Manufacturers:
 1. Custom Building Products; _____: www.custombuildingproducts.com/#sle.
 2. LATICRETE International, Inc; _____: www.laticrete.com/#sle.
 3. MAPEI Corporation; www.mapei.com.
 4. Substitutions: See Section 01 6000 - Product Requirements.
- B. Standard Grout: ANSI A118.6 standard cement grout.
 1. Applications: Use this type of grout where no other type of grout is indicated.
 2. Use sanded grout for joints 1/8 inch wide and larger; use unsanded grout for joints less than 1/8 inch wide.
 3. Color(s): As indicated on drawings.
- C. Epoxy Grout: ANSI A118.3 chemical resistant and water-cleanable epoxy grout.
 1. Applications: At all floor locations except kitchen. At walls in showers and kitchen.
 2. Color(s): As indicated on drawings.
- D. Furan Grout: ANSI A118.5 chemical resistant furan resin grout.
 1. Applications: At kitchen floor.
 2. Color(s): As indicated on drawings.

2.05 MAINTENANCE MATERIALS

- A. Grout Sealer: Liquid-applied, moisture and stain protection for existing or new Portland cement grout.
 1. Composition: Water-based colorless silicone.

2.06 ACCESSORY MATERIALS

- A. Waterproofing Membrane at suspended floors: Specifically designed for bonding to cementitious substrate under thick mortar bed or thin-set tile; complying with ANSI A118.10.
 1. Crack Resistance: No failure at 1/16 inch gap, minimum; comply with ANSI A118.12.
 2. Fluid or Trowel Applied Type:
 - a. Material: Synthetic rubber or Acrylic.
 - b. Thickness: 25 mils, minimum, dry film thickness.
- B. Reinforcing Mesh: 2 by 2 inch size weave of 16/16 wire size; welded fabric, galvanized.
- C. Backer Board: Cementitious type complying with ANSI A118.9; high density, glass fiber reinforced, 7/16 inch thick; 2 inch wide coated glass fiber tape for joints and corners.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that subfloor surfaces are smooth and flat within the tolerances specified for that type of work and are ready to receive tile.
- B. Verify that wall surfaces are smooth and flat within the tolerances specified for that type of work, are dust-free, and are ready to receive tile.
- C. Verify that subfloor surfaces are dust free and free of substances that could impair bonding of setting materials to subfloor surfaces.
- D. Verify that required floor-mounted utilities are in correct location.

3.02 PREPARATION

- A. Protect surrounding work from damage.
- B. Vacuum clean surfaces and damp clean.
- C. Seal substrate surface cracks with filler. Level existing substrate surfaces to acceptable flatness tolerances.
- D. Install backer board in accordance with ANSI A108.11 and board manufacturer's instructions. Tape joints and corners, cover with skim coat of setting material to a feather edge.

3.03 INSTALLATION - GENERAL

- A. Lay tile to pattern indicated. Do not interrupt tile pattern through openings.
- B. Cut and fit tile to penetrations through tile, leaving sealant joint space. Form corners and bases neatly. Align floor joints.
- C. 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.
- D. Form internal angles square and external angles bullnosed.
- E. Install thresholds where indicated.
- F. Sound tile after setting. Replace hollow sounding units.
- G. Keep control and expansion joints free of mortar, grout, and adhesive.
- H. Prior to grouting, allow installation to completely cure; minimum of 48 hours.
- I. Grout tile joints unless otherwise indicated.
- J. At changes in plane and tile-to-tile control joints, use tile sealant instead of grout, with either bond breaker tape or backer rod as appropriate to prevent three-sided bonding.

3.04 INSTALLATION - FLOORS - MORTAR BED METHODS

- A. Over interior concrete substrates, install in accordance with TCNA (HB) Method as listed below.
 - 1. Where epoxy or furan grout is indicated, but not epoxy or furan bond coat, install in accordance with TCNA (HB) Method F114, with cleavage membrane.
- B. Waterproofing Membrane: Install as recommended by manufacturer and as specified in the section in which the product is specified.
- C. Mortar Bed Thickness: varies 3/4 - 2 inch, unless otherwise indicated.

3.05 INSTALLATION - SHOWERS AND BATHTUB WALLS

- A. At tiled shower receptors install in accordance with TCNA (HB) Method B415, mortar bed floor, and W244, thin-set over cementitious backer unit walls.
- B. Grout with standard grout as specified above.

3.06 INSTALLATION - WALL TILE

- A. Over cementitious backer units on studs, install in accordance with TCNA (HB) Method W244, using membrane at toilet rooms.
- B. Over gypsum wallboard on wood or metal studs install in accordance with TCNA (HB) Method W243, thin-set with dry-set or latex-Portland cement bond coat, unless otherwise indicated.

3.07 CLEANING

- A. Clean tile and grout surfaces.

3.08 PROTECTION

- A. Do not permit traffic over finished floor surface for 4 days after installation.

END OF SECTION 09 3000

**SECTION 09 5100
ACOUSTICAL CEILINGS**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Suspended metal grid ceiling system.
- B. Acoustical units.
- C. Gypsum board units.
- D. Cementitious wood fiber plank acoustical ceiling

1.02 RELATED REQUIREMENTS

1.03 REFERENCE STANDARDS

- A. ASTM C635/C635M - Standard Specification for Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings; 2022.
- B. ASTM C636/C636M - Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels; 2019.
- C. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2023d.
- D. 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.
- E. ASTM E1264 - Standard Classification for Acoustical Ceiling Products; 2023.
- F. NFPA 286 - Standard Methods of Fire Tests for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth; 2024.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. 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. Product Data: Provide data on suspension system components and acoustical units.
- C. Samples: Submit two samples 4 x 4 inch in size illustrating material and finish of acoustical units.
- D. Samples: Submit two samples each, 6 inches long, of suspension system main runner.
- E. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
 - 1. See Section 01 6000 - Product Requirements, for additional provisions.
 - 2. Extra Acoustical Units: Quantity equal to 5 percent of total installed.

1.06 QUALITY ASSURANCE

- A. Suspension System Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.
- B. Acoustical Unit Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

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.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Acoustic Tiles/Panels:
 - 1. Armstrong World Industries, Inc; ____: www.armstrongceilings.com/#sle.
 - 2. Certainteed Architectural; ____: www.certainteed.com/ceilings-and-walls/#sle.
 - 3. USG Corporation; ____: www.usg.com/ceilings/#sle.
 - 4. Substitutions: See Section 01 6000 - Product Requirements.
- B. Suspension Systems:
 - 1. Same as for acoustical units.
 - 2. Substitutions: See Section 01 6000 - Product Requirements.

2.02 ACOUSTICAL UNITS

- A. Acoustical Units - General: ASTM E1264, Class A.
- B. Acoustical Panels Type A: Painted mineral fiber, ASTM E1264 Type III, with the following characteristics:
 - 1. Size: 24 by 48 inches.
 - 2. Thickness: 3/4 inches.
 - 3. Composition: Wet felted.
 - 4. Light Reflectance: 82 percent, determined in accordance with ASTM E1264.
 - 5. NRC Range: 70 to 75, determined in accordance with ASTM E1264.
 - 6. Ceiling Attenuation Class (CAC): 42, determined in accordance with ASTM E1264.
 - 7. Edge: Square.
 - 8. Surface Color: White.
 - 9. Surface Pattern: perforated, small holes and fissured.
 - 10. Suspension System: Exposed grid Type 1.
 - 11. Products:
 - a. Armstrong; School Zone Fine Fissured AirAssure: www.armstrong.com/#sle.
 - b. Substitutions: See Section 01 6000 - Product Requirements.
- C. Acoustical Panels Type B: Painted mineral fiber, ASTM E1264 Type III, with the following characteristics:
 - 1. Size: 24 by 24 inches.
 - 2. Thickness: 3/4 inches.
 - 3. Composition: Wet felted.
 - 4. Light Reflectance: 82 percent, determined in accordance with ASTM E1264.
 - 5. NRC Range: 70 to 75, determined in accordance with ASTM E1264.
 - 6. Ceiling Attenuation Class (CAC): 42, determined in accordance with ASTM E1264.
 - 7. Edge: Angled Tegular.
 - 8. Surface Color: White.
 - 9. Surface Pattern: perforated, small holes and fissured.
 - 10. Suspension System: Exposed grid Type 1.
 - 11. Products:
 - a. Armstrong; School Zone Fine Fissured AirAssure, www.armstrong.com/#sle.
 - b. Substitutions: See Section 01 6000 - Product Requirements.
 - 12. Location: Administration Areas and Offices
- D. FRPLay-in Ceiling Panels Type D:
 - 1. Comply with NFPA 286, Class A, ____.
 - 2. Surface Burning Characteristics: Flame spread index of 25 or less, smoke developed index of 450 or less, when tested in accordance with ASTM E84.
 - 3. Surface Texture: white gelcoat.
 - 4. Composition: FRP plastic.
 - 5. Panel Edge: Tegular.
 - 6. Color: White.

7. Suspension System: Exposed grid Type 1.
 8. Products:
 - a. Queit Technology Systems; ACC-U-SOUND PSD - Pyramidal Shaped Diffusers
<https://qtechsys.com/>.
 - b. Substitutions: See Section 01 6000 - Product Requirements.
- E. Acoustical Panels Type C:
1. Size: As indicated on drawings.
 2. Light Reflectance: 75 percent, determined in accordance with ASTM E1264.
 3. Flame spread: ASTM E 1264; Class A
 4. Panel Edge: Beveled.
 5. Thickness: 1-1/2 inch
 6. Surface Color: Natural - to be painted with roof deck.
 7. Mounting: Mechanical fastened to bottom of metal deck.
 8. Products:
 - a. Armstrong World Industries, Inc; Tectum: www.armstrongceilings.com.
 - b. Substitutions: See Section 01 6000 - Product Requirements.
- F. Gypsum Lay-in Ceiling Panels Type E at kitchen:
1. Comply with NFPA 286, Class A, _____.
 2. Surface Burning Characteristics: Flame spread index of 25 or less, smoke developed index of 450 or less, when tested in accordance with ASTM E84.
 3. Size: 24 by 48 inches.
 4. Surface Texture: Vinyl-laminated face with sealed back and edges.
 5. Light Reflectance: [77] percent, determined in accordance with ASTM E1264.
 6. Ceiling Attenuation Class (CAC): [40], determined in accordance with ASTM E1264.
 7. Panel Edge: Square.
 8. Color: White.
 9. Suspension System: Exposed grid Type 1.
 10. Products:
 - a. USG; Sheetrock Brand Clean Room Lay-in Gypsum Ceiling Panels:
<https://www.usg.com/content/usgcom/en.html>.
 - b. Substitutions: See Section 01 6000 - Product Requirements.

2.03 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.
- B. Exposed Steel Suspension System Type 1: Formed steel, commercial quality cold rolled; heavy-duty.
 1. Profile: Tee; 15/16 inch wide face.
 2. Construction: Double web.
 3. Finish: White painted.
 4. Products:
 - a. USG Donn; Brand DX/DXL26: www.usg.com/#sle..
 - b. Substitutions: See Section 01 6000 - Product Requirements.

2.04 ACCESSORIES

- A. Support Channels and Hangers: Galvanized steel; size and type to suit application, seismic requirements, and ceiling system flatness requirement specified.
- B. Hanger Wire: 12 gauge, 0.08 inch galvanized steel wire.
- C. Perimeter Moldings: Same metal and finish as grid.
 1. At Exposed Grid: Provide L-shaped molding for mounting at same elevation as face of grid.
 2. At Clouds: Provide edge trims as listed below and as indicated on the drawings.
 - a. Products:

- 1) Armstrong World Industries, Inc; Axiom Classic 6 inch Extruded Aluminum Trim:
www.armstrong.com/#sle..
- 2) Armstrong World Industries, Inc; Axiom Knife Edge Extruded Aluminum Trim:
www.armstrong.com/#sle.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Verify that layout of hangers will not interfere with other work.

3.02 INSTALLATION - SUSPENSION SYSTEM

- A. Install suspension system in accordance with ASTM C636/C636M, ASTM E580/E580M, and manufacturer's instructions and as supplemented in this section.
- B. Rigidly secure system, including integral mechanical and electrical components, for maximum deflection of 1:360.
- C. Locate system on room axis according to reflected plan.
- D. Perimeter Molding: Install at intersection of ceiling and vertical surfaces and at junctions with other interruptions.
 1. Use longest practical lengths.
- E. Install after major above-ceiling work is complete. Coordinate the location of hangers with other work.
- F. 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.
- G. Where ducts or other equipment prevent the regular spacing of hangers, reinforce the nearest affected hangers and related carrying channels to span the extra distance.
- H. Do not support components on main runners or cross runners if weight causes total dead load to exceed deflection capability.
- I. Support fixture loads using supplementary hangers located within 6 inches of each corner, or support components independently.
- J. Do not eccentrically load system or induce rotation of runners.
- K. Perimeter Molding: Install at intersection of ceiling and vertical surfaces and at junctions with other interruptions.
 1. Use longest practical lengths.
 2. Overlap and rivet corners.
- L. Install Tectum® Direct-Attached Ceiling Panels in accordance manufacturer's installation instructions.
- M. For seismic installations follow the requirements of the International Building Code, ASCE 7 and ASTM E580 and in install in accordance with the authorities having jurisdiction.

3.03 INSTALLATION - ACOUSTICAL UNITS

- A. Install acoustical units in accordance with manufacturer's instructions.
- B. Fit acoustical units in place, free from damaged edges or other defects detrimental to appearance and function.
- C. Fit border trim neatly against abutting surfaces.
- D. Install units after above-ceiling work is complete.
- E. Install acoustical units level, in uniform plane, and free from twist, warp, and dents.
- F. Cutting Acoustical Units:
 1. Make field cut edges of same profile as factory edges.
- G. Where round obstructions occur, provide preformed closures to match perimeter molding.

H. Install plastic lay-in panels at following minimum distance from conventional light sources:

3.04 TOLERANCES

A. Maximum Variation from Flat and Level Surface: 1/8 inch in 10 feet.

B. Maximum Variation from Plumb of Grid Members Caused by Eccentric Loads: 2 degrees.

END OF SECTION 09 5100

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**SECTION 09 6466
WOOD ATHLETIC FLOORING**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Wood athletic flooring.
- B. Subflooring.
- C. Resilient cushioning.
- D. Sheet vapor retarder.
- E. Floor finishes.
- F. Surface finishing.

1.02 REFERENCE STANDARDS

- A. MFMA (SPEC) - Guide Specifications for Maple Flooring Systems; current edition.

1.03 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data for flooring, floor finish materials, and resilient cushion.
- C. Shop Drawings: Indicate floor joint pattern and termination details.
 - 1. Indicate location, size, design, and color of game markings.
- D. Samples: Submit two samples 12 by 12 inch in size illustrating floor finish, color, and sheen.
- E. Maintenance Data: Include maintenance procedures and recommended maintenance materials.

1.04 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section.
 - 1. Minimum three years of documented experience.
- B. Installer Qualifications: Company specializing in installing products specified in this section.
 - 1. Minimum three years of documented experience.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials and store off the floor in a well-ventilated, weather-tight space.

1.06 FIELD CONDITIONS

- A. Do not install wood flooring until wet construction work is complete and permanent heat and air conditioning is installed and operating.
- B. Maintain room temperature between 55 degrees F and 75 degrees F and relative humidity between 35 to 50 percent for a period of seven days prior to delivery of materials to installation space, during installation, and after installation.
- C. Acclimate wood flooring materials to installation space a minimum of 48 hours prior to installation.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Wood Athletic Flooring:
 - 1. Action Floor Systems: www.actionfloors.com/#sle.
 - 2. Connor Sports Flooring; AGA-Neoshok: www.connorfloor.com/#sle.
 - 3. Robbins Sports Surfaces; Robbins 1st Bio-Cushion Classic: www.robbinsfloor.com/#sle.
 - 4. Horner Flooring; Safe 2, Safe Panel System.

2.02 WOOD ATHLETIC FLOORING

- A. General: Wood athletic flooring, system components provided by single manufacturer.

- B. Application: Gymnasium.
- C. System Description:
 - 1. Floating, double layer subfloor system, wood strip flooring.

2.03 COMPONENTS

- A. Wood Strip Flooring, Type _____:
 - 1. Species: Northern hard maple, kiln dried; tongue and groove edges, end matched.
 - 2. Grade: Third and better.
 - 3. Moisture Content: 7 to 9 percent.
 - 4. Thickness: 25/32 inch.
 - 5. Width: 2-1/4 inches.
 - 6. Length: Random, minimum of 9 inches.
- B. Subflooring: Two layers of 15/32 inch thick plywood, APA rated, exposure 1, minimum span rating of 32/16.
- C. Resilient Cushioning: Manufacturer's standard rubber pads, factory-applied to bottom side of subflooring.
 - 1. Thickness: 3/4 inch.
- D. Vapor Retarder: Polyethylene sheet, 6 mil thick; 2 inch wide tape for sealing sheet seams.
- E. Fasteners and Anchors: Manufacturer's standard type and size to suit application.

2.04 FINISHES

- A. Floor Finishes: Types recommended by flooring manufacturer and complying with MFMA specifications.
 - 1. Sealer: Oil based urethane.
 - 2. Finish Coats: Oil based urethane; high gloss.
 - 3. Game Marking Paint: Compatible with sealer and finish coats; colors as indicated on drawings.

2.05 ACCESSORIES

- A. Ventilating Base: Aluminum, 4 inch high with a 4 inch toe, pre-molded outside corners; mill finish.
- B. Edge Strip: Rubber Vent Cove Base.
- C. Game Socket Devices: Cast aluminum type, with anchors.
- D. Adhesives: Types recommended by flooring manufacturer.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify existing conditions before starting this work.
- B. Verify that concrete subfloor surface is smooth and flat to plus or minus 1/4 inch in 10 feet.
- C. Verify that required floor-mounted utilities are in correct location.

3.02 PREPARATION

- A. Prepare substrate to receive wood flooring in accordance with manufacturer's and MFMA instructions.
- B. Vacuum clean substrate.

3.03 INSTALLATION

- A. Place vapor retarder over concrete surface, overlap seams a minimum of 6 inches and seal with tape.
- B. Double Layer Plywood Subfloor:
 - 1. Place first layer at 45 degree angle to direction of finished floor, resilient pad side down.
 - 2. Fasten second layer (without pads) at 45 degree angle to first layer.
 - 3. Allow 1/4 inch between plywood subfloor edges.

- C. Install solid blocking at doorways, under stacked bleachers, and under locations of heavy equipment, in accordance with flooring manufacturer's recommendations.
- D. Wood Flooring:
 - 1. Install in accordance with manufacturer's and MFMA instructions.
 - 2. Lay flooring parallel to length of main playing area. Blind nail or staple to subfloor.
 - 3. Install edge strips at unprotected or exposed edges, and where flooring terminates.
 - 4. Provide 2 inch expansion space at walls and other interruptions.
- E. Install base at floor perimeter to cover expansion space in accordance with manufacturer's instructions. Miter inside corners.
- F. Install floor sockets and inserts to a depth sufficient to ensure flush top surface with floor surface.
- G. Finishing:
 - 1. Mask off adjacent surfaces before beginning sanding.
 - 2. Sand flooring to smooth even finish with no evidence of sander marks. Remove dust by vacuum.
 - 3. Apply finishes in accordance with floor finish manufacturer's and MFMA instructions.
 - 4. Apply one sealer coat and three finish coats.
 - 5. Apply first coat, allow to dry, then buff lightly with recommended pad to remove irregularities. Vacuum clean and wipe with damp, lint-free cloth before applying succeeding coats.
 - 6. Apply game lines/markers in accordance with layout indicated on drawings.
 - 7. Apply last coat of finish.

3.04 CLEANING

- A. Clean floor surfaces in accordance with floor finish manufacturer's instructions.

3.05 PROTECTION

- A. Prohibit traffic on finished floor for 72 hours after installation.
- B. Place protective coverings over finished floors; do not remove coverings until Date of Substantial Completion.

END OF SECTION 09 6466

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**SECTION 09 6500
RESILIENT FLOORING**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Resilient sheet flooring.
- B. Resilient tile flooring.
- C. Resilient base.
- D. Resilient stair accessories.
- E. Recycled rubber resilient flooring
- F. Installation accessories.

1.02 RELATED REQUIREMENTS

- A. Section 01 6116 - Volatile Organic Compound (VOC) Content Restrictions.
- B. Section 03 3000 - Cast-in-Place Concrete: Restrictions on curing compounds for concrete slabs and floors to receive adhesive-applied resilient flooring.

1.03 REFERENCE STANDARDS

- A. ASTM E648 - Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source; 2023.
- B. ASTM F1700 - Standard Specification for Solid Vinyl Floor Tile; 2020.
- C. ASTM F1861 - Standard Specification for Resilient Wall Base; 2021.
- D. NFPA 253 - Standard Method of Test for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source; 2023.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide data on specified products, describing physical and performance characteristics; including sizes, patterns and colors available; and installation instructions.
- C. Shop Drawings: Indicate seaming plans and floor patterns.
- D. Verification Samples: Submit two samples, 6 by 6 inch in size illustrating color and pattern for each resilient flooring product specified.
- E. Sustainable Design Submittal: Submit VOC content documentation for flooring and adhesives.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing specified flooring with minimum three years documented experience.
- B. Installer Qualifications: Company specializing in installing specified flooring with minimum three years documented experience.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Upon receipt, immediately remove any shrink-wrap and check materials for damage and the correct style, color, quantity and run numbers.
- B. Store all materials off of the floor in an acclimatized, weather-tight space.
- C. Maintain temperature in storage area between 55 degrees F and 90 degrees F.
- D. Protect roll materials from damage by storing on end.
- E. Do not double stack pallets.

1.07 FIELD CONDITIONS

- A. Store materials for not less than 48 hours prior to installation in area of installation at a temperature of 70 degrees F to achieve temperature stability. Thereafter, maintain conditions

above 55 degrees F.

PART 2 PRODUCTS

2.01 SHEET FLOORING

- A. Section 096516.23 - Vinyl Sheet Flooring

2.02 TILE FLOORING

- A. Vinyl Tile - Type ____: Solid vinyl with color and pattern throughout thickness.
1. Manufacturers:
 - a. Tarkett; www.commercial.tarkett.com.
 - b. Approved Substitutions: See Section 01 6000 - Product Requirements.
 2. Minimum Requirements: Comply with ASTM F1700, of Class corresponding to type specified.
 3. Critical Radiant Flux (CRF): Minimum 0.45 watt per square centimeter, when tested in accordance with ASTM E648 or NFPA 253.
 4. VOC Content Limits: As specified in Section 01 6116.
 5. Wear Layer Thickness: Minimum 20 mil.
 6. Total Thickness: 0.100 inch.
 7. Pattern: as indicated on the drawings.
 8. Color: As indicated on drawings.

2.03 STAIR COVERING

- A. Stair Nosings: 1-1/2 inch horizontal return, 1-1/8 inch vertical return, full width of stair tread in one piece.
1. Manufacturers:
 - a. Johnsonite, a Tarkett Company; ____: www.johnsonite.com/#sle.
 - b. Roppe Corp; See below: www.roppe.com/#sle.
 - c. Substitutions: See Section 01 6000 - Product Requirements.
 2. Material: Rubber.
 3. Texture: Ribbed.
 4. Color: To be selected by Architect from manufacturer's full range.

2.04 RESILIENT BASE

- A. Resilient Base: ASTM F1861, Type TP, rubber, thermoplastic; top set Standard Toe Base.
1. Manufacturers:
 - a. Johnsonite, a Tarkett Company; None - N/A: www.johnsonite.com/#sle.
 - b. Mannington Commercial; ____: www.manningtoncommercial.com/#sle.
 - c. Roppe Corp; None - N/A: www.roppe.com/#sle.
 - d. Substitutions: See Section 01 6000 - Product Requirements.
 2. Location: As indicated on drawings.
 3. Height: As indicated on drawings.
 4. Thickness: 0.125 inch.
 5. Finish: ____ .
 6. Length: Roll.
 7. Color: As indicated on drawings.
 8. Accessories: Premolded external corners.

2.05 ACCESSORIES

- A. Primers, Adhesives, and Seam Sealer: Waterproof; types recommended by flooring manufacturer.
- B. Adhesive for Rubber Flooring:
1. Manufacturers:
 - a. ecore Commercial; E-Grip III One-Component Urethane: www.ecorecommercial.com.
 - b. Substitutions: Section 01 6000 - Product Requirements.

- C. Moldings, Transition and Edge Strips: Same material as flooring or where applicable, as indicated on drawings.
 - 1. Manufacturers:
 - a. Johnsonite: www.johnsonite.com.
 - b. Roppe Corp;[None - N/A]: www.roppe.com/#sle.
 - c. Substitutions: See Section 01 6000 - Product Requirements.

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 Subfloor Surfaces: Verify that substrates are ready for resilient flooring installation by testing for moisture and alkalinity (pH).
 - 1. Obtain instructions if test results are not within limits recommended by resilient flooring manufacturer and adhesive materials manufacturer.

3.02 PREPARATION

- A. Prepare floor substrates as recommended by flooring and adhesive manufacturers.
- B. Remove subfloor ridges and bumps. Fill minor low spots, cracks, joints, holes, and other defects with subfloor filler to achieve smooth, flat, hard surface.
- C. Prohibit traffic until filler is fully cured.
- D. Clean substrate.

3.03 INSTALLATION - GENERAL

- A. Starting installation constitutes acceptance of subfloor conditions.
- B. Install in accordance with manufacturer's written instructions.
- C. Spread only enough adhesive to permit installation of materials before initial set.
- D. Fit joints and butt seams tightly.
- E. Set flooring in place, press with heavy roller to attain full adhesion.
- F. Where type of floor finish, pattern, or color are different on opposite sides of door, terminate flooring under centerline of door.
- G. Install edge strips at unprotected or exposed edges, where flooring terminates, and where indicated.
- H. Scribe flooring to walls, columns, cabinets, floor outlets, and other appurtenances to produce tight joints.

3.04 INSTALLATION - SHEET FLOORING

- A. Lay flooring with joints and seams parallel to longer room dimensions, to produce minimum number of seams. Lay out seams to avoid widths less than 1/3 of roll width; match patterns at seams.
- B. Cut sheet at seams in accordance with manufacturer's instructions.

3.05 INSTALLATION - TILE FLOORING

- A. Mix tile from container to ensure shade variations are consistent when tile is placed, unless otherwise indicated in manufacturer's installation instructions.

3.06 INSTALLATION - RESILIENT BASE

- A. Fit joints tightly and make vertical. Maintain minimum dimension of 18 inches between joints.
- B. Install base on solid backing. Bond tightly to wall and floor surfaces.

- C. Scribe and fit to door frames and other interruptions.

3.07 CLEANING

- A. Remove excess adhesive from floor, base, and wall surfaces without damage.
- B. Clean in accordance with manufacturer's written instructions.

3.08 PROTECTION

- A. Prohibit traffic on resilient flooring for 48 hours after installation.

END OF SECTION 09 6500

**SECTION 09 6516
VINYL SHEET FLOORING**

PART 1 - GENERAL

1.01 SUMMARY

- A. Provide and install commercial resilient vinyl flooring per manufacturer's installation requirements and recommendations.

1.02 REFERENCE STANDARDS

- A. ASTM E 1745-97 – Standard Specification for Water Vapor Retarders
- B. ASTM E 1643 – Standard Practice for Installation of Water Vapor Retarders used in contact with Earth or Granular Fill Under Concrete Slabs
- C. ASTM E 96-00 – Standard Test Method for Water Vapor Transmission of Materials
- D. ACI 302.1R-04 – Guide for Floor and Concrete Slab Construction
- E. ACI 302.2R-06 – Guide for Concrete Slabs that Receive Moisture-Sensitive Flooring Materials
- F. ASTM F710-08 – Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring
- G. ASTM F 1869 – Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride

1.03 SUBMITTALS

- A. Product Data: Submit manufacturer's product data and installation instructions for watertight application.
- B. Samples: Submit representative sample of each material specified, indicating visual characteristics and finish.

1.04 QUALITY ASSURANCE

- A. Contractor will assure compliance with 1.05 Verifications of Job Conditions to allow for proper installation.
- B. Comply with local governing codes and regulations.
- C. Use Protect-All factory trained installers provided by local distributor.
- D. Manufacturer provides a limited product warranty against manufacturing defects. Warranty does not in any way cover installation-related issues.

1.05 INSTALLATION VERIFICATIONS

- A. Manufacturer installation instructions for watertight applications along with required accessories, located at www.protect-allflooring.com.
- B. Experience of installer pertaining to Protect-All Rapid Weld and heat welding the Protect-All system.
- C. Provide representative samples of product depicting color and finished surface of installed flooring material. Include range samples, if variation of finish is anticipated.
- D. Provide a mock-up showing cove base, corner, and drain details with welding example.
- E. Provide documentation attesting to the successful use of product in wet areas.
- F. Provide copy of manufacturer's product warranty.

1.06 VERIFICATIONS OF JOB CONDITIONS

- A. Proper substrate
 - 1. Assure that the substrate material is suitable for installation of flooring as indicated by manufacturer. Approved substrates include: marine-grade or underlayment grade plywood, cement board, and concrete (non-gypsum based only), properly cleaned and prepared per manufacturer's guidelines.
 - a. Protect-All is not to be installed over any existing finish, such as quarry tile, any paint, or any type of tile.

- b. Protect-All must not be installed in an “operating environment,” meaning an environment that is not prepared to close entirely for the duration of the installation.
 2. Concrete substrates must be dry and free of curing compounds, sealers, hardeners, and other materials whose presence would interfere with bonding of adhesive. Determine adhesion and dryness characteristics by performing bond and moisture tests recommended by floor covering manufacturer.
 3. Verify a clean, dry, and structurally sound surface to accept adhesive, free of cracks, ridges, depression, scales, and foreign deposits of any kind.
 4. Use only cementitious patching and filling compounds (3500 PSI). Consult manufacturer for details.
 5. Assure that the levelness (FL 15), and flatness (FF20 5/16 in 10 Ft.) of surface is in compliance with manufacturer’s guidelines.
 6. Verify that sub-floor surfaces (concrete, marine-grade or underlayment grade plywood, cement board) are ready for resilient flooring installation by testing moisture emission rate and alkalinity, in accordance with ASTM F 710; obtain instructions if test results are not within limits recommended by resilient flooring manufacturer and adhesive materials manufacturer.
- B. Environmental Conditionals
1. The contractor and installer of product are responsible for providing and maintaining a proper installation environment.
 2. Installation area must be enclosed and watertight with all walls, wall finishes, doors, and floor penetrations in place.
 3. Proper temperature acclimation of flooring material is required prior to installation at a minimum of 24 hours.
 4. Assure confinement of space during installation and curing of adhesives to prevent other trades from damaging the product or compromising the adhesion.
 5. Maintain a constant temperature during the installation and throughout the curing of adhesives.
 6. Provide a secure area to store materials for installation.
 7. Building must be completely enclosed and watertight. HVAC system must be on at least 7 days prior to installation beginning, keeping the interior temperature at 70°. This temperature should be maintained during the installation, and an additional 8 days after completion.
 - a. Protect-All cannot have any heavy foot, or rolling load traffic until flooring adhesive has fully cured, 7-8 days.
- C. Proper Drain and Other Floor Penetration Elevations.
1. All drains to be installed level and 3/16” above the surface of the substrate with a proper slope of 1/8” – 1/4” per foot.
 2. When sloping to the drain area is specified, the slope should not be less than 36" in diameter and more than 3/8" in depth.
 3. All other penetrations should be installed 3/16” above the substrate.
 4. Wall penetrations must be a minimum of 8” above the floor surface.

PART 2 - PRODUCTS

2.01 BASIS OF DESIGN

- A. Protect-All Commercial Flooring as manufactured by Oscoda Plastics®, Inc.
1. Protect-All sheets in 5' x 8' or 5' x 5' in 1/4" thickness with color chosen from manufacturer's samples in matte finish.
 2. Approved Substitutions: See Section 01 6000 - Product Requirements
- B. Accessories - Use Manufacturer approved only.
1. Manufacturer approved 2-part epoxy flooring adhesives
 2. Cove base system with a minimum height of 6".
 - a. Corner rod for the cove base system.
 3. Rapid Weld or V-Rod for floor seams.
 4. Aluminum or stainless steel cove base cap (Z-bar).

5. Stainless steel drain rings, corner guards, and transition strips .
6. Stainless steel fasteners and anchors for drain rings, corner guards, and transition strips.
7. Protect-All E-6100 sealant.
8. Other installation materials as required.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Follow manufacturer recommendations for laying sheets out.
- B. Flooring must be cut tight to all penetrations.
- C. Adhere the floor material using manufacturer's recommended adhesive for the particular substrate type, job conditions, and in compliance with spread rate and proper trowel size.
- D. Roll floor into adhesive with 100 lb. roller immediately and a second time one hour later, as per manufacturer directions.
- E. Install stainless steel drain rings around all drains and other surface penetrations. Drain rings are to be routed into the floor surface and mounted flush with the top of the flooring. Secure drain rings using Stainless Steel fasteners and anchors to provide a mechanical bond to the substrate.
- F. Install cove base as recommended by manufacturer with proper adhesive and top sealant. Protect-All Rapid Weld or heat-weld all seams.
- G. Install cove base cap fastening to wall a minimum of 8" on-center using stainless steel fasteners.
- H. Protect-All Rapid Weld or heat-weld all field material seams using manufacturer's welding material, proper tools, and installation methods.
- I. Stainless steel transitions as provided by the manufacturer must be used in doorways and transition areas. Use stainless steel fasteners, and anchors to secure.
- J. All exposed edges are to be sealed with manufacturer's E-6100 sealant.

3.02 CLEANING

- A. Refer to the manufacturer's cleaning recommendations located at www.protect-allflooring.com

END OF SECTION 09 6516

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**SECTION 09 6813
TILE CARPETING**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Carpet tile, fully adhered fully adhered.
- B. Matching roll carpet for direct glue installation on base.

1.02 RELATED REQUIREMENTS

- A. Section 01 6116 - Volatile Organic Compound (VOC) Content Restrictions.

1.03 REFERENCE STANDARDS

- A. ASTM D2859 - Standard Test Method for Ignition Characteristics of Finished Textile Floor Covering Materials; 2016 (Reapproved 2021).
- B. ASTM E648 - Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source; 2023.
- C. CRI 104 - Standard for Installation of Commercial Carpet; 2015.
- D. NFPA 253 - Standard Method of Test for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source; 2023.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Samples: Submit two carpet tiles illustrating backing,color and pattern design for each carpet color selected.
- C. Operation and Maintenance Data: Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning.
- D. 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 15 percent of total installed of each color and pattern installed.

1.05 QUALITY ASSURANCE

- A. Installer Qualifications: Company specializing in installing carpet tile with minimum three years documented experience and approved by carpet tile manufacturer.

1.06 FIELD CONDITIONS

- A. Store materials in area of installation for minimum period of 24 hours prior to installation.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Tile Carpeting:
 - 1. Milliken & Company;[_____]: www.milliken.com/#sle.
 - 2. Substitutions: See Section 01 6000 - Product Requirements.

2.02 MATERIALS

- A. Tile Carpeting, Type Walk-off Carpet: Tufted, manufactured in one color dye lot.
 - 1. Product: Obex Tile manufactured by Millikin.
 - 2. Tile Size: 24 by 24 inch, nominal.
 - 3. Thickness: pile 0.203 inch.
 - 4. Color: As indicated on drawings.
 - 5. Pattern: As indicated on drawings.
 - 6. Critical Radiant Flux: Minimum of 0.22 watts/sq cm, when tested in accordance with ASTM E648 or NFPA 253.
 - 7. Surface Flammability Ignition: Pass ASTM D2859 (the "pill test").
 - 8. VOC Content: Comply with Section 01 6116.

2.03 ACCESSORIES

- A. Carpet base with hemmed edges:
- B. Carpet Tile Adhesive: Recommended by carpet tile manufacturer.
- C. Transitions: As indicated on drawings.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that subfloor surfaces are smooth and flat within tolerances specified for that type of work and are ready to receive carpet tile.
- B. Verify that wall surfaces are smooth and flat within the tolerances specified for that type of work, are dust-free, and are ready to receive carpet tile.
- C. Verify that subfloor surfaces are dust-free and free of substances that could impair bonding of adhesive materials to subfloor surfaces.
- D. Verify that required floor-mounted utilities are in correct location.

3.02 PREPARATION

- A. Prepare floor substrates as recommended by flooring and adhesive manufacturers.
- B. Remove subfloor ridges and bumps. Fill minor or local low spots, cracks, joints, holes, and other defects with subfloor filler.
- C. Apply, trowel, and float filler to achieve smooth, flat, hard surface. Prohibit traffic until filler is cured.

3.03 INSTALLATION

- A. Starting installation constitutes acceptance of subfloor conditions.
- B. Install carpet tile in accordance with manufacturer's instructions and CRI 104 (Commercial).
- C. Blend carpet from different cartons to ensure minimal variation in color match.
- D. Cut carpet tile clean. Fit carpet tight to intersection with vertical surfaces without gaps.
- E. Lay carpet tile in square pattern, with pile direction parallel to next unit, set parallel to building lines.
- F. Locate change of color or pattern between rooms under door centerline.
- G. Fully adhere carpet tile to substrate.
- H. Adhere carpet tile as base finish up vertical surfaces to form base. Terminate top of base with hemmed edge.
- I. Trim carpet tile neatly at walls and around interruptions.
- J. Complete installation of edge strips, concealing exposed edges.

3.04 CLEANING

- A. Remove excess adhesive without damage, from floor, base, and wall surfaces.
- B. Clean and vacuum carpet surfaces.

END OF SECTION 09 6813

**SECTION 09 6816
SHEET CARPETING**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Carpet, stretched-in with cushion underlay and direct-glued.
- B. Matching roll carpet for direct glue installation on base.

1.02 RELATED REQUIREMENTS

- A. Section 01 6116 - Volatile Organic Compound (VOC) Content Restrictions.

1.03 REFERENCE STANDARDS

- A. ASTM D2859 - Standard Test Method for Ignition Characteristics of Finished Textile Floor Covering Materials; 2016 (Reapproved 2021).
- B. ASTM E648 - Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source; 2023.
- C. CRI 104 - Standard for Installation of Commercial Carpet; 2015.
- D. NFPA 253 - Standard Method of Test for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source; 2023.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on specified products, describing physical and performance characteristics; sizes, patterns, colors available, and method of installation.
- C. Samples: Submit two samples illustrating backing, color, and pattern for each carpet specified.
- D. Maintenance Data: Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning.
- E. 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: Quantity equal to {15} percent of each type, color, and pattern installed.

1.05 QUALITY ASSURANCE

- A. Installer Qualifications: Company specializing in installing carpet with minimum three years documented experience and approved by carpet manufacturer.

1.06 FIELD CONDITIONS

- A. Store materials in area of installation for minimum period of 24 hours prior to installation.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Carpet:
 - 1. Tarkett; www.tarkett.com.
 - 2. Substitutions: See Section 01 6000 - Product Requirements.

2.02 CARPET

- A. Roll Carpet: Same manufacturer, type, color and pattern, and face fiber characteristics as carpet tile, [] feet wide, manufactured in same color dye lot as tile. Roll carpet to be used as carpet base as required.
- B. Backing: Powerbond manufactured by Tarkett
- C. Location: AS
- D. Color: As indicated on drawings
- E. Pattern: As indicated on drawings

2.03 ACCESSORIES

- A. Carpet Adhesive: Recommended by carpet manufacturer.
- B. Transitions: As indicated on drawings.

PART 3 EXECUTION

3.01 EXAMINATION

3.02 INSTALLATION - GENERAL

- A. Install carpet and cushion in accordance with manufacturer's instructions and CRI 104 (Commercial).
- B. Verify carpet match before cutting to ensure minimal variation between dye lots.
- C. 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.
- D. Install carpet tight and flat on subfloor, well fastened at edges, with a uniform appearance.

3.03 CLEANING

- A. Remove excess adhesive from floor and wall surfaces without damage.
- B. Clean and vacuum carpet surfaces.

END OF SECTION 09 6816

**SECTION 09 7505
ULTRACOMPACT SURFACING**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Interior wall finishes.
- B. Setting materials and accessories.
 - 1. Related Sections:
 - a. Division 01: Administrative, procedural, and temporary work requirements.
 - b. Section 09 2116 - Cementitious backer unit substrate.
 - c. Section 09 2116 - Gypsum board substrate.

1.02 REFERENCES

- A. American National Standards Institute (ANSI):
 - 1. A108.4 - Installation of Ceramic Tile with Organic Adhesives or Water Cleanable Tile Setting Epoxy Adhesive.
 - 2. A108.5 - Installation of Ceramic Tile with Dry-Set Portland Cement Mortar or Latex Portland Cement Mortar.
 - 3. A108.10 - Installation of Grout in Tilework.
 - 4. A118.3 - Chemical Resistant, Water Cleanable, Tile Setting and Grouting Epoxy and Water Cleanable Tile Setting Epoxy Adhesive.
 - 5. A118.4 - Latex-Portland Cement Mortar.
 - 6. A118.6 - Ceramic Tile Grouts.
- B. ASTM International (ASTM):
 - 1. C97/C97M - Standard Test Methods for Absorption and Bulk Specific Gravity of Dimension Stone.
 - 2. C99/C99M - Standard Test Method for Modulus of Rupture of Dimension Stone.
 - 3. C170/C170M - Standard Test Method for Compressive Strength of Dimension Stone.
 - 4. C370 - Standard Test Method for Moisture Expansion of Fired Whiteware Products.
 - 5. C373/C373M - Standard Test Method for Water Absorption, Bulk Density, Apparent Porosity, and Apparent Specific Gravity of Fired Whiteware Products.
 - 6. C482 - Standard Test Method for Bond Strength of Ceramic Tile to Portland Cement Paste.
 - 7. C484 - Standard Test Method for Thermal Shock Resistance of Glazed Ceramic Tile.
 - 8. C501 - Standard Test Method for Relative Resistance to Wear of Unglazed Ceramic Tile by the Taber Abraser.
 - 9. C648 - Standard Test Method for Breaking Strength of Ceramic Tile.
 - 10. C650 - Standard Test Method for Resistance of Ceramic Tile to Chemical Substances.
 - 11. C674 - Standard Test Method for Flexural Properties of Ceramic Whiteware Materials.
 - 12. C880/C880M - Standard Test Method for Flexural Strength of Dimension Stone.
 - 13. 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.
 - 14. C1353/C1353M - Standard Test Method for Abrasion Resistance of Dimension Stone Subjected to Foot Traffic Using a Rotary Platform, Double-Head Abraser. C. Greenguard Environmental Institute (GEI) - Certification Programs.

1.03 SUBMITTALS

- A. Submittals for Review:
 - 1. See Section 01 3000 - Administrative Requirements, for submittal procedures.
 - 2. Product data: Provide manufacture'd data on panel, mortar, grout, and accessories.
 - 3. Samples:
 - a. 3 x 3 inch ultracompact sheet samples showing available colors.
 - 1) 3/8 x 3/8 x 3 inch grout samples showing available colors.
 - 2) 3 inch long joint sealer samples showing available colors.

B. Closeout Submittals:

1. Maintenance Data: Include recommended cleaning materials and procedures, and list of materials detrimental to ultracompact sheet.

1.04 QUALITY ASSURANCE

A. Manufacturer Qualifications: Minimum 10 years documented experience in manufacture of solid surfacing materials.

B. Mockup:

1. Construct wall finish mockup, 6 feet wide x 6 feet high.
2. Locate where directed by architect.
3. Approved mockup may remain as part of the Work.

1.05 1.5 WARRANTY

A. Provide manufacturer's 10 year warranty against defects in materials and workmanship.

PART 2 PRODUCTS

2.01 ULTRACOMPACT SURFACING

A. Manufactures:

1. Cosentino USA, Inc.; www.dekton.com
2. Substitutions: See Section 01 6000 - Product Requirements.

B. Materials - Ultracompact Sheet

1. Ultracompact surfacing sheet:
 - a. Product: Dekton by Cosentino.
 - b. Composition: Selected raw materials formed into flat slabs utilizing sinterized particle technology.
 - c. Color: To be selected from manufacturer's full color range.
 - d. Surface finish: To be selected from manufacturer's full range.
 - e. Thickness: 8 mm.
 - f. Physical characteristics:
 - 1) Moisture expansion: 0.02 percent average, tested to ASTM C370.
 - 2) Breaking strength: 3963 lbf average, tested to ASTM C648.
 - 3) Flexural strength: 10,828 psi average, tested to ASTM C674.
 - 4) Water absorption: 0.03 percent average, tested to ASTM C373C373M.
 - 5) Static coefficient of friction (slip resistance): 0.80 dry and 0.66 wet, tested to ASTM C1028.
 - 6) Wet dynamic coefficient of friction (DCOF): 0.57 average, tested to ANSI A137.1.
 - 7) Resistance to wear: 182.2 average wear index, tested to ASTM C501. h. Thermal shock resistance: No defects, tested to ASTM C484.
 - 8) Bond strength: 423 psi average, tested to ASTM C482.
 - 9) Specific absorption and gravity, tested to ASTM C97/C97M:
 - (a) Average percent of absorption per weight: 0.02 percent.
 - (b) Average density: 156 pounds per cubic foot.
 - 10) Breaking module, tested to ASTM C99/C99M:
 - (a) Average dry breaking strength: 8128 PSI.
 - (b) Average wet flexural strength: 7490 PSI.
 - 11) Flexural strength, tested to ASTM C880:
 - (a) Average dry flexural strength: 6840 PSI.
 - (b) Average wet flexural strength: 6205 PSI.
 - 12) Resistance to compression, tested to ASTM C170/C170M:
 - (a) Average dry compression: 34,409 PSI.
 - (b) Average wet compression: 17,823 PSI.
 - 13) Resistance to abrasion, tested to ASTM C1353/C1353M: 349 average abrasion index.

- 14) Resistance to chemical substances; tested to ASTM C650:
 - (a) Acetic acid, 3 percent: No affect.
 - (b) Acetic acid, 10 percent: No affect.
 - (c) Ammonium chloride, 100 g/L: No affect.
 - (d) Citric acid solution, 30 g/L n: No affect.
 - (e) Citric acid solution 100 g/L: No affect.
 - (f) Lactic acid, 5 percent: No affect.
 - (g) Phosphoric acid, 3 percent: No affect.
 - (h) Phosphoric acid, 10 percent: No affect.
 - (i) Sulphuric acid, 30 g/L: No affect.
 - (j) Sulphuric acid, 100 G/L: No affect.
 - (k) Chemical pool products: No affect.
 - (l) Sodium hydrochlorite solution, 20 mg/L: No affect.
 - (m) Hydrochloric acid solution, 3 percent: No affect.
 - (n) Hydrochloric acid solution, 18 percent: No affect.
 - (o) Potassium hydroxide, 30 g/L: No affect.
 - (p) Potassium hydroxide, 100 g/L: No affect.

C. Materials - Mortar

1. Latex-Portland Cement Mortar: ANSI A118.4.
2. Epoxy Mortar: ANSI A118.3.

D. Materials - Grout:

1. Grout A.
 - a. ANSI A118.6, unsanded.
 - b. Color: As indicated on plans.
2. Grout B.
 - a. ANSI A108.8
 - b. Color: As indicated on plans.

E. Accessories

1. Joint Sealer:
 - a. Mapesil 100 Percent Silicone Sealant by Mapei.
 - b. Volatile organic compound (VOC) content: Per Section 01 6116.
 - c. Color: Clear.

F. Fabrication

1. Cut panels accurately to required shapes and dimensions.
2. Fabricate with 3/8 inch joints.

G. Trim: Brushed stainless steel, style as indicated on plans and dimensions to suit application, for setting using mortar or adhesive.

1. Applications:
 - a. Open edges on top of Ultracompact sheets only. Install on sheets that are below 6' in height.
 - b. Reveals
2. Manufacturers:
 - a. Schluter-Systems: www.schluter.com/#sle.
 - b. Substitutions: See Section 01 6000 - Product Requirements.

H.

PART 3 EXECUTION

3.01 PREPARATION

- A. Clean surfaces to receive panels; remove loose and foreign matter than could interfere with adhesion.
- B. Remove ridges and projections. Fill voids and depressions with patching compound compatible with setting materials.

- C. Allowable Substrate Tolerances:
 - 1. Maximum variation in substrate surface: 1/8 inch in 8 feet.
 - 2. Maximum height of abrupt irregularities: 1/32 inch.

3.02 INSTALLATION

- A. Install panels in accordance with manufacturer's instructions.
- B. Set in thin set mortar bed in accordance with ANSI A 108.5.
- C. Epoxy mortar by spot application method in accordance with ANSI A108.4 at all toilet rooms, locker rooms, and all wet areas.
- D. Furan resin mortar in accordance with ANSI A108.8 at kitchen.
- E. Install with hairline joints.
- F. Allow mortar to set for a minimum of 24 hours.
- G. Apply joint sealer to joints; finish smooth and flush.
- H. Provide control joints at changes in plane, changes in backup material, at joints between panels and adjacent construction, over joints in substrate, and at maximum 30 feet on center. Fill with joint sealer; finish flush and smooth.

3.03 INSTALLATION TOLERANCES

- A. Maximum variation from level and plumb: 1/4 inch in 10 feet, noncumulative.
- B. Maximum variation in plane between adjacent pieces at joint: Plus or minus 1/16 inch.
- C. Maximum variation in joint width: Plus or minus 1/16 inch.

3.04 CLEANING

- A. Clean panels in accordance with manufacture's instructions.

END OF SECTION 09 7505

**SECTION 09 8430
SOUND-ABSORBING WALL AND CEILING UNITS**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Sound-absorbing panels.

1.02 REFERENCE STANDARDS

- A. ASTM C423 - Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method; 2023.
- B. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2023d.
- C. ASTM E795 - Standard Practices for Mounting Test Specimens during Sound Absorption Tests; 2023.

1.03 ACTION SUBMITTALS

- A. Product Data: For each type of panel edge, core material, and mounting indicated.
- B. Shop Drawings: For PET Wall and Ceiling Panels. Include mounting devices and details; details at panel head, base, joints, and corners; and details at ceiling, floor base, and wall intersections. Include elevations showing panel sizes and direction. Indicate panel edge and core materials.
- C. Samples for Initial Selection: For each type of PET Wall and Ceiling Panels manufacturer's full range of color and thickness.
- D. Samples for Verification: For the following products. Prepare Samples from same material to be used for the Work.
 - 1. Panel Edge: 12-inch-(300mm-) long Sample showing edge profile, corner, and finish.
 - 2. Core Material: 12-inch-(300mm-) beveled or square edge sample showing each corner.
 - 3. Mounting Device: Full-size Sample.
 - 4. Sample Panels: No larger than 36 by 36 inches (914 by 914 mm). Show joints and mounting methods.
- E. Product Certificates: For each type of Sound-Tack wall panel, signed by product manufacturer.

1.04 INFORMATIONAL SUBMITTALS

- A. Coordination Drawings: Show intersections with wall base, doors, electrical outlets and switches, thermostats, lighting fixtures, air outlets and inlets, access panels, and other adjacent work.
- B. Qualification Data: For fabricator and testing agency.
- C. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for each type PET Wall and Ceiling Panels.

1.05 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For PET Wall and Ceiling Panels to include in maintenance manuals. Include written cleaning and stain-removal recommendations.
- B. Warranty: Special warranty specified in this Section.

1.06 MAINTENANCE MATERIALS SUBMITTALS

- A. Furnish extra materials described below, before installation begins, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. PET Wall and Ceiling Panels: Full-size units equal to 5 percent of amount installed, but no fewer than 5 attachment devices.

1.07 QUALITY ASSURANCE

- A. Fabricator Qualifications: Shop that employs skilled workers who custom-fabricate products similar to those required for this Project and whose products have a record of successful in-

service performance.

- B. Source Limitations: Obtain acoustical wall panels through one source from a single manufacturer.
- C. Fire-Test-Response Characteristics: Provide PET Wall and Ceiling Panels with the following surface-burning characteristics as determined by testing identical products per ASTM E 84 by UL or another testing and inspecting agency acceptable to authorities having jurisdiction and in accordance with 803.6.2 of 2016 IBC
 - 1. Flame-Spread Index: 25 or less.
 - 2. Smoke-Developed Index: 450 or less.
- D. Mockups: Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials, fabrications and installation.
 - 1. Install mockups in the location and of the size indicated or, if not indicated, as directed by Architect.
 - 2. Install mockup of typical wall area as shown on Drawings.
 - a. Include intersection at wall and ceiling corner and door opening.
 - 3. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination."
- E. DELIVERY, STORAGE, AND HANDLING
 - 1. Comply with Felt panel wall panel manufacturers' written instructions for minimum and maximum temperature and humidity requirements for shipment, storage, and handling.
 - 2. Deliver materials and panels in unopened bundles and store in a temperature-controlled dry place and adequate air circulation.
 - 3. Protect panel edges from crushing and impact.
- F. PROJECT CONDITIONS
 - 1. Environmental Limitations: Do not install PET Wall and Ceiling Panels until spaces are enclosed and weatherproof, wet work in spaces is complete and dry, work above ceilings is complete, and ambient temperature and humidity conditions are maintained at levels indicated for Project when occupied for its intended use.
 - 2. Lighting: Do not install PET Wall and Ceiling Panels until a lighting level of not less than 50 fc (538 lux) is provided on surfaces to receive PET Wall and Ceiling Panels.
 - 3. Air-Quality Limitations: Keep PET Wall and Ceiling Panels from exposure to airborne odors, such as tobacco smoke, and install panels under conditions free from odor contamination of ambient air.
 - 4. Field Measurements: Verify locations of PET Wall and Ceiling Panels by field measurements before fabrication and indicate measurements on Shop Drawings.
- G. WARRANTY
 - 1. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of PET Wall and Ceiling Panels that fail in performance, materials, or workmanship within specified warranty period.
 - a. Failures in materials include, but are not limited to, fabric sagging, distorting, or releasing from panel edge; or warping of core.
 - b. Warranty Period: Two years from date of Substantial Completion.

PART 2 PRODUCTS

2.01 FABRIC-COVERED SOUND-ABSORBING UNITS

- A. Manufacturers:
 - 1. LAMVIN; SONIC PANEL: www.lamvin.com/#sle.
 - 2. Owens Corning Conwed Designscape; Rebound: www.conweddesignscape.com/#sle.
 - 3. Substitutions: See Section 01 6000 - Product Requirements.
- B. General:
 - 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.

- C. Fabric-Covered Acoustical Panels for Walls and Ceilings:
 - 1. Panel Core: Manufacturer's standard rigid or semi-rigid fiberglass core.
 - a. Facing: 1/16 inch impact-resistant surface laminated to core.
 - 2. Noise Reduction Coefficient (NRC): 1.00 at 2" and 1.35 at 4" when tested in accordance with ASTM C423 for Type A mounting, per ASTM E795.
 - 3. Panel Sizes: As indicated on drawings.
 - 4. Panel Thickness: 2" at Cafetorium and 4" at Band inches.
 - 5. Edges: Perimeter edges reinforced by a formulated resin hardener.
 - 6. Corners: Square.
 - 7. Fabric: Guilford of Maine: www.guilfordofmaine.com.
 - 8. Color: As selected by Architect from manufacturer's full range.
 - 9. Patterns: Where fabric with directional or repeating patterns or fabric with directional weave is used, mark for installation in same direction.
 - 10. Mounting Method: Spline-mounted, concealed.

2.02 WOOD FIBER SOUND-ABSORBING UNITS

- A. Manufacturers:
 - 1. Armstrong World Industries, Inc; _____: www.armstrongceilings.com/#sle.
 - 2. Substitutions: See Section 01 6000 - Product Requirements.
- B. Wood Fiber Acoustical Panels for Walls and Ceilings: Cementitious wood fiber.
 - 1. Size: As indicated on drawings.
 - 2. Thickness: 1 inch.
 - 3. Noise Reduction Coefficient (NRC): 0.70 to 0.80 when tested in accordance with ASTM C423 for Type A mounting, per ASTM E795.
 - 4. Panel Edge: Square.
 - 5. Surface Pattern: Coarse.
 - 6. Surface Color: As indicated on drawings.
 - 7. Mounting: Use fixing clips to attach to metal hat channels anchored to wall substrate.

2.03 PLASTIC SOUND-ABSORBING UNITS

- A. Manufacturers:
 - 1. MDC; <https://www.mdcwall.com/acoustic-solutions>
 - 2. Onnit Systems; www.onnitsystems.com
 - 3. J2 Systems; <https://www.j2systems.net>.
 - 4. Substitutions: See Section 01 6000 - Product Requirements.
- B. Thermoformed Copolymer Plastic Acoustical Panels for Walls and Ceilings:
 - 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.
 - 2. Noise Reduction Coefficient (NRC): 0.4 when tested in accordance with ASTM C423 for Type B mounting, per ASTM E795.
 - 3. CNC cut materials required as indicated on the drawings
 - 4. Mounting: Back-mounted with mechanical fasteners and or adhesive.

2.04 FABRICATION

- A. Tolerances: Fabricate to finished tolerance of plus or minus 1/16 inch for thickness, overall length and width, and squareness from corner to corner.

2.05 ACCESSORIES

- A. Spline-Mounting Accessories: Manufacturer's standard concealed connecting splines of extruded aluminum designed for screw attachment to walls, with coordinating moldings and trim for interior and exterior corners and miscellaneous conditions.
 - 1. Color of Exposed Trim: As selected from manufacturer's standards.
- B. Fixing Clips: Manufacturers standard for application as indicated.
- C. Furring Strips: Metal hat channel.

- D. Panel Adhesive: Acceptable to acoustical panel manufacturer for application as indicated.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Examine substrates for conditions detrimental to installation of acoustical units. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION

- A. Install acoustical units in locations as indicated, following manufacturer's installation instructions. Comply with manufacturer's written instruction for installation of panels using type of concealed mounting accessories indicated or, if not indicated, as recommended by manufacturer. Anchor panels securely to supporting substrate.
- B. Install mounting accessories and supports in accordance with shop drawings.
- C. Match and level pattern and grain among adjacent panels.
- D. Align panels accurately, with edges plumb and top edges level. Scribe to fit accurately at adjoining work and penetrations.
- E. Furring Mounted Wood Veneer Panels:
 - 1. Install furring strip along meeting edges of adjacent panels to ensure they are attached to same furring strip along abutted edge; 24 inch on center, maximum.
 - 2. Install acoustic back-up material between furring as required for application.
 - 3. Adhere first panel from edge to furring strip, and attach subsequent panels using fixing clips.
- F. Furring-Mounted Cementitious Wood Fiber Panels:
 - 1. Install furring strip along meeting edges of adjacent panels to ensure they are attached to same furring strip along abutted edge; 24 inches on center, maximum.
 - 2. Install acoustic insulation between furring as indicated on drawings.
 - 3. Adhere first panel from edge to furring strip; attach subsequent panels using fasteners.
- G. Install acoustical units to construction tolerances of plus or minus 1/16 inch for the following:
 - 1. Plumb and level.
 - 2. Flatness.
 - 3. Width of joints.

3.03 CLEANING

- A. Remove pills and extraneous materials.
- B. Clean sound-absorptive panels upon completion of installation from dust and other foreign materials, following manufacturer's instructions.

3.04 PROTECTION

- A. Provide protection of installed acoustical panels until Date of Substantial Completion.
- B. Replace panels that cannot be cleaned and repaired to satisfaction of the Architect.

END OF SECTION 09 8430

**SECTION 09 9123
INTERIOR PAINTING**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Surface preparation.
- B. Field application of paints, stains and varnishes.
- C. Scope: Finish interior surfaces exposed to view, unless fully factory-finished and unless otherwise indicated.
 - 1. Prime surfaces to receive wall coverings.
 - 2. Mechanical and Electrical:
 - a. In finished areas, paint insulated and exposed pipes, conduit, and boxes, insulated and exposed ducts, hangers, brackets, collars and supports, mechanical equipment and electrical equipment, unless otherwise indicated.
 - b. Paint interior surfaces of air ducts and convector and baseboard heating cabinets that are visible through grilles and louvers with one coat of flat black paint to visible surfaces.
- D. Do Not Paint or Finish the Following Items:
 - 1. Items factory-finished unless otherwise indicated; materials and products having factory-applied primers are not considered factory finished.
 - 2. Items indicated to receive other finishes.
 - 3. Items indicated to remain unfinished.
 - 4. Fire rating labels, equipment serial number and capacity labels, bar code labels, and operating parts of equipment.
 - 5. Floors, unless specifically indicated.
 - 6. Glass.
 - 7. Concealed pipes, ducts, and conduits.

1.02 RELATED REQUIREMENTS

- A. Section 016116 - Volatile Organic Compound (VOC) Content Restrictions.
- B. Section 055000 - Metal Fabrications: Shop-primed items.
- C. Section 099600 - High-Performance Coatings.

1.03 REFERENCE STANDARDS

- A. ASTM D16 - Standard Terminology for Paint, Related Coatings, Materials, and Applications 2016.
- B. ASTM D4258 - Standard Practice for Surface Cleaning Concrete for Coating 2005 (Reapproved 2017).
- C. SSPC-SP 1 - Solvent Cleaning 2015, with Editorial Revision (2016).
- D. SSPC-SP 2 - Hand Tool Cleaning 1982, with Editorial Revision (2004).
- E. SSPC-SP 3 - Power Tool Cleaning 1982, with Editorial Revision (2004).
- F. SSPC-SP 6 - Commercial Blast Cleaning 2007.
- G. SSPC-SP 13 - Surface Preparation of Concrete 1997 (Reaffirmed 2003).

1.04 SUBMITTALS

- A. See Section 013000 - 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.
- C. Samples: Submit TWO paper "draw down" samples, 8" X 11" in size, and illustrating range of colors available for each finishing product specified.
 1. Where sheen is specified, submit samples in only that sheen.
- D. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
 1. See Section 016000 - Product Requirements, for additional provisions.
 2. Extra Paint and Finish Materials: 1 gallon (4 L) of each color; from the same product run, store where directed.
 3. Label each container with color in addition to the manufacturer's label.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified, with minimum three years documented experience.
- B. Applicator Qualifications: Company specializing in performing the type of work specified with minimum three years' experience and approved by manufacturer.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.
- B. Container Label: Include manufacturer's name, type of paint, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.
- C. Paint Materials: Store at minimum ambient temperature of 45 degrees F (7 degrees C) and a maximum of 90 degrees F (32 degrees C), in ventilated area, and as required by manufacturer's instructions.
- D. FIELD CONDITIONS
 1. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the paint product manufacturer.
 2. Follow manufacturer's recommended procedures for producing best results, including testing of substrates, moisture in substrates, and humidity and temperature limitations.
 3. Provide lighting level of 80 ft candles (860 lx) measured mid-height at substrate surface.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Provide paints and finishes from the same manufacturer to the greatest extent possible.
 1. In the event that a single manufacturer cannot provide specified products, minor exceptions will be permitted provided approval by Architect is obtained using the specified procedures for substitutions.
 - a. Basis-of-Design Product: Painting and coating products manufactured by
 - 1) PPG Paints: www.ppgpaints.com
 - b. Paints:
 - 1) PPG Paints: www.ppgpaints.com/#sle.
 - 2) Sherwin-Williams Company: www.protective.sherwin-williams.com/industries/#sle.
 - 3) Benjamin Moore Paints; benjaminmoore.com.

2.02 PAINTS AND FINISHES - GENERAL

- A. Paints and Finishes: Ready mixed, unless intended to be a field-catalyzed paint.
 1. Provide paints and finishes of a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating, with good flow and brushing properties, and capable of drying or curing free of streaks or sags.
 2. 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 specifically described in manufacturer's product instructions.
- B. Volatile Organic Compound (VOC) Content: Comply with Section 016116.
- 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. Extend colors to surface edges; colors may change at any edge as directed by Architect.
 3. In finished areas, finish pipes, ducts, conduit, and equipment the same color as the wall/ceiling they are mounted on/under.
 4. 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. Paint I-OP - Interior Surfaces to be Painted, Unless Otherwise Indicated: Including gypsum board, concrete, concrete masonry units, brick, wood, plaster, uncoated steel, shop primed steel, galvanized steel and aluminum.
 1. Two top coats and one coat primer.
 2. Top Coat(s): High Performance Architectural Interior Latex.
 - a. Products:
 - 1) PPG Paints Pitt-Tech Plus WB DTM Industrial Enamel, 90-1110 Series, Satin.
 3. Top Coat(s): Institutional Low Odor/VOC Interior Latex.
 - a. Products:
 - 1) PPG Paints Speed-hide zero Latex, 6-4410XI Series, Satin.
 4. Top Coat Sheen:
 - a. Satin: MPI gloss level 4; use this sheen for items subject to frequent touching by occupants, including door frames and railings.
 - b. Semi-Gloss: MPI gloss level 5; use this sheen at all locations.
 5. Primer: As recommended by top coat manufacturer for specific substrate.
- B. Paint I-OP-MD-DT - Medium Duty Door/Trim: For surfaces subject to frequent contact by occupants, including metals and wood:
 1. Two top coats and one coat primer.
 2. Top Coat(s): High Performance Architectural Interior Latex.
 - a. Products:
 - 1) PPG Paints Pitt-Tech Plus WB DTM Industrial Enamel, 90-1110 Series, Satin.
 - 2) PPG Paints Pitt-Tech Plus WB DTM Industrial Enamel, 90-1210 Series, Semi-Gloss.
 3. Top Coat Sheen:
 - a. Satin: MPI gloss level 4; use this sheen at all locations.
 - b. Semi-Gloss: MPI gloss level 5; use this sheen at all locations.
 4. Primer: As recommended by top coat manufacturer for specific substrate.
- C. Paint I-OP-MD-WC - Medium Duty Vertical and Overhead: Including gypsum board, plaster, concrete, concrete masonry units, uncoated steel, shop primed steel, galvanized steel and aluminum.
 1. Two top coats and one coat primer.
 2. Top Coat(s): Interior Light Industrial Coating, Water Based.
 - a. Products:
 - 1) PPG Paints Pitt-Tech Plus WB DTM Industrial Enamel, 90-1110 Series, Satin.
 - 2) PPG Paints Pitt-Tech Plus WB DTM Industrial Enamel, 90-1210 Series, Semi-Gloss.
 3. Primer: As recommended by top coat manufacturer for specific substrate.

- D. Paint I-OP-DF - Dry Fall: Metals; exposed structure and overhead-mounted services in utilitarian spaces, including shop primed steel deck, structural steel, metal fabrications, galvanized ducts, galvanized conduit, galvanized piping.
 - 1. Shop primer by others.
 - 2. Top Coat: Water Based Dry Fall for Galvanized Steel.
 - a. Products:
 - 1) PPG Paints Speed hide Super Tech Water Based Interior Dry-Fog, 6-735XI, Flat.
 - 2) PPG Paints Speed hide Super Tech Water Based Interior Dry-Fog, 6-727XI, Semi-Gloss.
 - 3. Primer: As recommended by top coat manufacturer for specific substrate.
- E. Paint I-TR-C - Transparent Finish on Concrete Floors.
 - 1. 2 coats sealer.
 - 2. Sealer: Water Based for Concrete Floors; MPI #99.
 - a. Products:
 - 1) PPG Paints Perma-Crete Plex-Seal WB Interior/Exterior Clear Sealer Stain, 4-6200. (MPI #99)

2.04 PRIMERS

- A. Primers: Provide the following unless other primer is required or recommended by manufacturer of top coats.
 - 1. Alkali Resistant Water Based Primer.
 - a. Products:
 - 1) PPG Paints Perma-Crete Interior/Exterior Alkali Resistant Primer, 4-603 Series.
 - 2. Interior Institutional Low Odor/VOC Primer Sealer.
 - a. Products:
 - 1) PPG Paints Speed hide zero Interior Latex Sealer, 6-4900XI.
 - 3. Interior/Exterior Latex Block Filler.
 - a. Products:
 - 1) PPG Paints Speed hide Masonry Hi Fill Latex Block Filler, 6-15.
 - 4. Interior Latex Primer Sealer.
 - a. Products:
 - 1) PPG Paints Speed hide Interior Latex Sealer, 6-2.
 - 5. Interior Drywall Primer Sealer.
 - a. Products:
 - 1) PPG Paints Speed hide Interior Latex Sealer, 6-2.
 - 6. Anti-Corrosive Alkyd Primer for Metal.
 - a. Products:
 - 1) PPG Devguard Multi-Purpose Primer, 4160 Series.
 - 7. Interior/Exterior Quick Dry Alkyd Primer for Metal.
 - a. Products:
 - 1) PPG Devguard Multi-Purpose Primer, 4160 Series.
 - 8. Interior Water Based Primer for Galvanized Metal.
 - a. Products:
 - 1) PPG Devguard Multi-Purpose Primer, 4160 Series.
 - b. PPG Paints Pitt-Tech plus DTM Industrial Primer, 90-912 Series.

2.05 ACCESSORY MATERIALS

- A. Accessory Materials: Provide primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials as required for final completion of painted surfaces.
- B. Patching Material: Latex filler.
- C. Fastener Head Cover Material: Latex filler.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Do not begin application of paints and finishes until substrates have been properly prepared.
- B. Verify that surfaces are ready to receive work as instructed by the product manufacturer.
- C. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially effect proper application.
- D. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
- E. Test shop-applied primer for compatibility with subsequent cover materials.
- F. Measure moisture content of surfaces using an electronic moisture meter. Do not apply finishes unless moisture content of surfaces are below the following maximums:
 - 1. Gypsum Wallboard: 12 percent.
 - 2. Plaster and Stucco: 12 percent.
 - 3. Masonry, Concrete, and Concrete Masonry Units: 12 percent.
 - 4. 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 repair existing paints or finishes that exhibit surface defects.
- D. Remove or mask surface appurtenances, including electrical plates, hardware, light fixture trim, escutcheons, and fittings, prior to preparing surfaces or finishing.
- E. Seal surfaces that might cause bleed through or staining of topcoat.
- F. 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 concrete according to ASTM D4258. Allow to dry.
 - 3. Prepare surface as recommended by top coat manufacturer and according to SSPC-SP 13.
- G. 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.
- H. 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.
- I. Gypsum Board: Fill minor defects with filler compound. Spot prime defects after repair.
- 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. 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. Remove rust, loose mill scale, and other foreign substances using methods recommended in writing by paint manufacturer and blast cleaning according to SSPC-SP 6 "Commercial Blast Cleaning". Protect from corrosion until coated.

3.03 APPLICATION

- A. Remove unfinished louvers, grilles, covers, and access panels on mechanical and electrical components and paint separately.
- B. Apply products in accordance with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual".
- C. Do not apply finishes to surfaces that are not dry. Allow applied coats to dry before next coat is applied.
- D. Apply each coat to uniform appearance in thicknesses specified by manufacturer.
- E. Dark Colors and Deep Clear Colors: Regardless of number of coats specified, apply as many coats as necessary for complete hide.
- F. Vacuum clean surfaces of loose particles. Use tack cloth to remove dust and particles just prior to applying next coat.
- G. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.

3.04 CLEANING

- A. Collect waste material that could constitute a fire hazard, place in closed metal containers, and remove daily from site.

3.05 PROTECTION

- A. Protect finishes until completion of project.
- B. Touch-up damaged finishes after Substantial Completion.

END OF SECTION 09 9123

**SECTION 09 9113
EXTERIOR PAINTING**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Surface preparation.
- B. Field application of paints.
- C. Scope: Finish exterior surfaces exposed to view, unless fully factory-finished and unless otherwise indicated.
- 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. Stainless steel, anodized aluminum, bronze, terne-coated stainless steel, zinc, and lead.
 - 6. Floors, unless specifically indicated.
 - 7. Ceramic and other types of tiles.
 - 8. Brick, glass unit masonry, architectural concrete, cast stone, integrally colored plaster and stucco.
 - 9. Exterior insulation and finish system (EIFS).
 - 10. Glass.
 - 11. Concealed pipes, ducts, and conduits.

1.02 RELATED REQUIREMENTS

- A. Section 01 6116 - Volatile Organic Compound (VOC) Content Restrictions.
- B. Section 05 5000 - Metal Fabrications: Shop-primed items.
- C. Section 05 5100 - Metal Stairs: Shop-primed items.
- D. Section 09 9123 - Interior Painting.

1.03 REFERENCE STANDARDS

- A. MPI (APSM) - Master Painters Institute Architectural Painting Specification Manual; Current Edition.
- B. SSPC-SP 1 - Solvent Cleaning; 2015, with Editorial Revision (2016).
- C. SSPC-SP 2 - Hand Tool Cleaning; 2018.
- D. SSPC-SP 6 - Commercial Blast Cleaning; 2007.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide complete list of products to be used, with the following information for each:
 - 1. Manufacturer's name, product name and/or catalog number, and general product category (e.g. "alkyd enamel").
 - 2. MPI product number (e.g. MPI #47).
 - 3. Cross-reference to specified paint system(s) product is to be used in; include description of each system.
 - 4. If proposal of substitutions is allowed under submittal procedures, explanation of substitutions proposed.
- C. Samples: Submit two paper chip samples, ___by___ inch in size illustrating range of colors available for each surface finishing product scheduled.
- D. 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 in addition to the manufacturer's label.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified, with minimum three years documented experience.
- B. Applicator Qualifications: Company specializing in performing the type of work specified with minimum three years experience and approved by manufacturer.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.
- B. Container Label: Include manufacturer's name, type of paint, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.
- C. Paint Materials: Store at minimum ambient temperature of 45 degrees F and a maximum of 90 degrees F, in ventilated area, and as required by manufacturer's instructions.

1.07 FIELD CONDITIONS

- A. Do not apply materials when surface and ambient temperatures are outside the 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. Provide lighting level of 80 ft candles measured mid-height at substrate surface.

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.
- B. Paints:
 1. PPG Paints; _____: www.ppgpaints.com/#sle.
 2. Sherwin-Williams Company; _____: www.sherwin-williams.com/#sle.

2.02 PAINTS AND FINISHES - GENERAL

- A. Paints and Finishes: Ready-mixed, unless required to be a field-catalyzed paint.
 1. Provide paints and finishes of a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating, with good flow and brushing properties, and capable of drying or curing free of streaks or sags.
 2. Supply each paint material in quantity required to complete entire project's work from a single production run.
 3. Do not reduce, thin, or dilute paint or finishes or add materials unless such procedure is described explicitly in manufacturer's product instructions.
- B. Volatile Organic Compound (VOC) Content: Comply with Section 01 6116.
- C. Sheens: Provide the sheens specified; where sheen is not specified, sheen will be selected later by Architect from the manufacturer's full line.
- D. Colors: As indicated in Color Schedule.

2.03 PAINT SYSTEMS - EXTERIOR

- A. Exterior Surfaces to be Painted, Unless Otherwise Indicated: Including primed metal.
 1. Two top coats and one coat primer.
 2. Top Coat(s): Exterior Light Industrial Coating, DTM Acrylic, Water Based; MPI #163.

- a. Products:
 - 1) Behr Premium Interior/Exterior Direct-To-Metal Paint Semi-Gloss [No.3200]. (MPI #163)
 - 2) PPG Paints Pitt-Tech Plus EP DTM Industrial Enamel, 90-1610 Series, Semi-Gloss. (MPI #163)
 - 3) Valspar Professional DTM Acrylic Topcoat, No. 81120 Series, Semi-Gloss.
3. Top Coat Sheen:
 - a. Semi-Gloss: MPI gloss level 5; use this sheen at all locations.
4. Primer: As recommended by top coat manufacturer for specific substrate.

2.04 PRIMERS

- A. Primers: Provide primers as required or recommended by manufacturer of top coats.

2.05 ACCESSORY MATERIALS

- A. Accessory Materials: Provide primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials as required for final completion of painted surfaces.
- B. Patching Material: Latex filler.
- C. Fastener Head Cover Material: Latex filler.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Do not begin application of paints and finishes until substrates have been properly prepared.
- B. Verify that surfaces are ready to receive work as instructed by the product manufacturer.
- C. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially affect proper application.
- D. Test shop-applied primer for compatibility with subsequent cover materials.

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 for finishing.
- D. Seal surfaces that might cause bleed through or staining of topcoat.
- E. Remove mildew from impervious surfaces by scrubbing with solution of tetra-sodium phosphate and bleach. Rinse with clean water and allow surface to dry.
- F. Galvanized Surfaces:
 1. Remove surface contamination and oils and wash with solvent according to SSPC-SP 1.
 2. Prepare surface according to SSPC-SP 2.
 - 3.
 4. Rinse the metal and let it dry completely for several hours.
 5. Rinse the metal with a weak solution of water and ammonia and allow it to dry.
 6. Remove any handles or other attachments from the metal.
 7. Sand the entire metal surface thoroughly, including crevices and dents.
 8. Wipe the entire surface with the tack cloths.
- G. 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.
 3. Remove rust, loose mill scale, and other foreign substances using methods recommended in writing by paint manufacturer and blast cleaning according to SSPC-SP 6 Commercial Blast Cleaning. Protect from corrosion until coated.

H. Metal Doors to be Painted: Prime metal door top and bottom edge surfaces.

3.03 APPLICATION

- A. Apply products in accordance with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual".
- B. Do not apply finishes to surfaces that are not dry. Allow applied coats to dry before next coat is applied.
- C. Apply each coat to uniform appearance.
- D. Vacuum clean surfaces of loose particles. Use tack cloth to remove dust and particles just prior to applying next coat.
- E. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.

3.04 CLEANING

- A. Collect waste material that could constitute a fire hazard, place in closed metal containers, and remove daily from site.

3.05 PROTECTION

- A. Protect finishes until completion of project.

END OF SECTION 09 9113

**SECTION 09 9600
HIGH-PERFORMANCE COATINGS**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. High performance coatings.
- B. Surface preparation.

1.02 RELATED REQUIREMENTS

- A. Section 016116 - Volatile Organic Compound (VOC) Content Restrictions.
- B. Section 099113 - Exterior Painting.
- C. Section 099123 - Interior Painting: Requirements for mechanical and electrical equipment surfaces.

1.03 REFERENCE STANDARDS

- A. 40 CFR 59, Subpart D - National Volatile Organic Compound Emission Standards for Architectural Coatings; U.S. Environmental Protection Agency current edition.
- B. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials 2018b.
- C. ASTM D4258 - Standard Practice for Surface Cleaning Concrete for Coating 2005 (Reapproved 2017).
- D. SSPC V1 (PM1) - Good Painting Practice: Painting Manual, Volume 1 2016.
- E. SSPC-PA 1 - Shop, Field, and Maintenance Painting of Steel 2016.
- F. SSPC-PA 2 - Procedure for Determining Conformance to Dry Coating Thickness Requirements 2015.
- G. SSPC-SP 1 - Solvent Cleaning 2015, with Editorial Revision (2016).
- H. SSPC-SP 2 - Hand Tool Cleaning 1982, with Editorial Revision (2004).
- I. SSPC-SP 3 - Power Tool Cleaning 1982, with Editorial Revision (2004).
- J. SSPC-SP 5 - White Metal Blast Cleaning 2007.
- K. SSPC-SP 6 - Commercial Blast Cleaning 2007.
- L. SSPC-SP 10 - Near-White Blast Cleaning 2007.
- M. SSPC-SP 13 - Surface Preparation of Concrete 1997 (Reaffirmed 2003).

1.04 SUBMITTALS

- A. See Section 013000 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide complete list of all products to be used, with the following information for each:
 - 1. Manufacturer's name, product name and/or catalog number, and general product category (e.g. "alkyd enamel").
 - 2. Cross-reference to specified coating system(s) product is to be used in; include description of each system.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience.

1.06 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 coating, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.

- C. Coating Materials: Store at minimum ambient temperature of 45 degrees F (7 degrees C) and a maximum of 90 degrees F (32 degrees C), in ventilated area, and as required by manufacturer's instructions.

1.07 FIELD CONDITIONS

- A. Do not install materials when temperature is below 55 degrees F (13 degrees C) or above 90 degrees F (32 degrees C).
- B. Maintain this temperature range, 24 hours before, during, and 72 hours after installation of coating.
- C. Restrict traffic from area where coating is being applied or is curing.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Provide high performance coating products from the same manufacturer to the greatest extent possible.
 - 1. Basis-of-Design Product: Painting and coating products manufactured by
 - a. PPG Paints: www.ppgpaints.com
 - 2. High-Performance Coatings:
 - a. PPG Paints: www.ppgpaints.com/#sle.
 - b. Sherwin-Williams Company: www.protective.sherwin-williams.com/industries/#sle.
 - c. Benjamin Moore Paints; benjaminmoore.com.
 - 3. Substitutions: See 01 6000 - Product Requirements.

2.02 HIGH-PERFORMANCE COATINGS

- A. Provide coating systems that meet the following minimum performance criteria, unless more stringent criteria are specified:

2.03 TOP COAT MATERIALS

- A. Coatings - General: Provide complete multi-coat systems formulated and recommended by manufacturer for the applications indicated, in the thicknesses indicated; number of coats specified does not include primer or filler coat.
 - 1. Volatile Organic Compound (VOC) Content:
 - a. Provide coatings that comply with the most stringent requirements specified in the following:
 - 1) 40 CFR 59, Subpart D--National Volatile Organic Compound Emission Standards for Architectural Coatings.
 - 2) Utah Rule R307-361 Architectural Coatings Rule.
 - 3) 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. Latex Coating Type High Performance Direct to Metal Acrylic for Hollow Metal Core Door and Window Frames and for Ferrous Metal Beams and Guardrails and Ductwork:
 - 1. Top Coat(s): Latex, Interior, High Performance Architectural.
 - a. Sheen: Satin.
 - b. Products:
 - 1) PPG Paints; Pitt-Tech HP Satin Enamel, 90-1110 Series: www.ppgpaints.com/#sle.
- C. Epoxy Coating for Concrete:
 - 1. Number of coats: Two.
 - 2. Product Characteristics:
 - a. Comply with the performance requirements specified above for moderate exposure.
 - 3. Top Coat(s): Polyamide Epoxy.
 - a. Sheen: Gloss.
 - b. Products:

- 1) PPG Paints; Amerlock 2VOC: www.ppgpaints.com/#sle
- 2) Location: As indicated on the drawings.
- 3) PPG Paints, Perma-Crete Plex-Seal WB Clear Sealer, 4-6200 for Janitor Room Floor, Storage Closets and Woodshop.
- c. Color: As selected by architect from manufacturer's full line.
- D. Top Coat(s): High Performance Institutional, Two-Component, Water Based Coating.
 1. Sheen: Semi-Gloss for Restrooms and Shower Areas, Gypsum Board Walls & Ceilings.
 2. Products:
 - a. PPG Paints; Pitt-Glaze WB Water-Borne Acrylic Epoxy 16-598 Series, Gloss/16-599 Series, Semi-Gloss: www.ppgpaints.com/#sle.
- E. High-Build Epoxy Coating for Exterior Exposed Steel Columns, Steel Angle Lintels, and Bollards:
 1. Number of Coats: Two.
 2. Product Characteristics:
 3. Top Coat(s): Epoxy, High-Build.
 - a. Sheen: Gloss.
 - b. Products:
 - 1) PPG Paints; Amerlock 400 Epoxy, Semi-Gloss, AK-400 Series; www.ppgpaints.com/#sle.
- F. Urethane Coating for Exterior Exposed Steel Columns, Steel Angle Lintels, and Bollards, Topcoat:
 1. Number of Coats: Two.
 2. Top Coat(s): Polyurethane, Two-Component.
 - a. Sheen: Semi-Gloss.
 - b. Products:
 - 1) PPG Paints; Pitthane High Build Semi-Gloss Urethane Enamel, 95-8800 Series; www.ppgpaints.com/#sle.

2.04 PRIMERS

- A. Primers: Provide the following unless other primer is required or recommended by coating manufacturer.
 1. Primer Sealer, Latex, Interior.
 - a. Products:
 - 1) PPG Paints; Speed hide Latex Quick Dry Sealer, 6-2;
 - 2) www.ppgpaints.com/#sle.
 2. Rust-Inhibitive, Water Based.
 - a. Products:
 - 1) PPG Paints; Pitt-Tech plus DTM Industrial Primer, 4020 PF Series; www.ppgpaints.com/#sle.

2.05 ACCESSORY MATERIALS

- A. Accessory Materials: Provide all primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials as required for final completion of coated surfaces.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Do not begin application of coatings until substrates have been properly prepared.
- C. Verify that substrate surfaces are ready to receive work as instructed by the coating manufacturer. Obtain and follow manufacturer's instructions for examination and testing of substrates.
- D. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially affect proper application.

- E. Test shop-applied primer for compatibility with subsequent cover materials.

3.02 PREPARATION

- A. Clean surfaces of loose foreign matter.
- B. Remove substances that would bleed through finished coatings. If un-removable, seal surface with shellac.
- C. Remove finish hardware, fixture covers, and accessories and store.
- D. Existing Painted and Sealed Surfaces:
 - 1. Remove loose, flaking, and peeling paint. Feather edge and sand smooth edges of chipped paint.
 - 2. Clean with mixture of trisodium phosphate and water to remove surface grease and foreign matter.
- 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. Prepare surface as recommended by coating manufacturer and according to SSPC-SP 13.
- F. 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.
- G. Ferrous Metal:
 - 1. Solvent clean according to SSPC-SP 1.
 - 2. Remove rust, loose mill scale, and other foreign substances using methods recommended in writing by paint manufacturer and blast cleaning according to SSPC-SP 6 "Commercial Blast Cleaning", and protect from corrosion until coated.
- H. Protect adjacent surfaces and materials not receiving coating from spatter and overspray; mask if necessary to provide adequate protection. Repair damage.

3.03 PRIMING

- A. Apply primer to all surfaces, unless specifically not required by coating manufacturer. Apply in accordance with coating manufacturer's instructions.

3.04 COATING APPLICATION

- A. Apply coatings in accordance with manufacturer's written instructions, to thicknesses specified.
- B. Apply in uniform thickness coats, without runs, drips, pinholes, brush marks, or variations in color, texture, or finish. Finish edges, crevices, corners, and other changes in dimension with full coating thickness.

3.05 CLEANING

- A. Collect waste material that could constitute a fire hazard, place in closed metal containers, and remove daily from site.
- B. Clean surfaces immediately of overspray, splatter, and excess material.
- C. After coating has cured, clean and replace finish hardware, fixtures, and fittings previously removed.

3.06 PROTECTION

- A. Protect finished work from damage.

END OF SECTION 09 9600

**SECTION 10 1100
VISUAL DISPLAY UNITS**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Porcelain enamel steel markerboards.

1.02 RELATED REQUIREMENTS

- A. Section 09 2116 - Gypsum Board Assemblies: Concealed supports in metal stud walls.

1.03 REFERENCE STANDARDS

- A. ANSI A135.4 - Basic Hardboard; 2012 (Reaffirmed 2020).
- B. ANSI A208.1 - American National Standard for Particleboard; 2022.
- C. ASTM A424/A424M - Standard Specification for Steel, Sheet, for Porcelain Enameling; 2018.
- D. ASTM C208 - Standard Specification for Cellulosic Fiber Insulating Board; 2022.
- E. PS 1 - Structural Plywood; 2023.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide manufacturer's data on markerboard, tackboard, tackboard surface covering, trim, and accessories.
- C. Shop Drawings: Indicate wall elevations, dimensions, joint locations , special anchor details.
- D. Samples: Color charts for selection of color and texture of chalkboard, porcelain enamel steel markerboard, glass markerboard, tackboard, tackboard surface covering, and trim.
- E. Test Reports: Show compliance to specified surface burning characteristics requirements.
- F. Manufacturer's printed installation instructions.

1.05 WARRANTY

- A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
- B. Provide life of the building warranty for markerboard to include warranty against discoloration due to cleaning, crazing or cracking, and staining.

PART 2 PRODUCTS

2.01 VISUAL DISPLAY UNITS

- A. Porcelain Enamel Steel Markerboards:
 - 1. Manufacturers:
 - a. ADP LEMCO, <https://www.adplemco.com/>
 - b. Substitutions: See Section 01 6000 - Product Requirements.
 - 2. Color: As selected from manufacturer's full range.
 - 3. Core: Particleboard, manufacturer's standard thickness, laminated to face sheet.
 - 4. Backing: Aluminum foil, laminated to core.
 - 5. Size: As indicated on drawings.
 - 6. Frame: Extruded aluminum , with concealed fasteners.
 - 7. Frame Finish: Anodized, natural.
 - 8. Accessories: Provide chalk tray, map rail, flag holder, and map hooks.

2.02 MATERIALS

- A. Porcelain Enameled Steel Sheet: ASTM A424/A424M, Type I, Commercial Steel, with fired-on vitreous finish.
- B. Vinyl Coated Fabric: ASTM F793/F793M Category IV.
- C. Plywood: PS 1 Grade C-D, softwood.
- D. Hardboard for Cores: ANSI A135.4, Class 1 - Tempered, S2S (smooth two sides).

- E. Particleboard: ANSI A208.1; wood chips, set with waterproof resin binder, sanded faces.
- F. Fiber Board: ASTM C208, cellulosic fiber board.
- G. Foil Backing: Aluminum foil sheet, 0.005 inch thick.
- H. Steel Sheet Backing: 28 gauge, 0.0149 inch, galvanized.
- I. Adhesives: Type used by manufacturer.

2.03 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, roller brackets, and provide 1 for each 2' of rail to fit map rail.
- C. Temporary Protective Cover: Sheet polyethylene, 8 mil thick.
- D. Flag Holders: Cast aluminum bored to receive 1 inch diameter flag staff, bracketed to fit top rail of board.
- E. Marker Tray: Aluminum, manufacturer's standard profile, one piece full length of markerboard, molded ends, concealed fasteners, same finish as frame.
- F. Mounting Brackets: Concealed.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that field measurements are as indicated.
- B. Verify that internal wall blocking is ready to receive work and positioning dimensions are as indicated on shop drawings.

3.02 INSTALLATION

- A. Install boards in accordance with manufacturer's instructions.
- B. Secure units level and plumb.
- C. Butt Joints: Install with tight hairline joints.

3.03 CLEANING

- A. Clean board surfaces in accordance with manufacturer's instructions.
- B. Cover with protective cover, taped to frame.
- C. Remove temporary protective cover at Date of Substantial Completion.

END OF SECTION 10 1100

**SECTION 10 1200
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 5969
- C. Wall mounted display cases 18D

1.02 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.

1.03 SUBMITTALS

- A. See Section 013000 - Administrative Requirements for submittal procedures.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
 - 1. Recommendations for maintenance and cleaning of finished surfaces.
- C. Shop drawings for each Display Case Assembly are required, including:
 - 1. Layout and installation details.
 - 2. Elevations
- D. Shop Drawings: Include plans, elevations, and details showing type and thickness of glass, glazing, anchoring, trim, and accessories.

1.04 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. 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.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. 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.

1.06 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.

1.07 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 017800.

PART 2 PRODUCTS

2.01 ROLLING DOORS

- A. Basis of Design Manufacturer:
 - 1. Stylmark Showcases: www.stylmark.com.

- a. Product: Model 610187 without door verticals.
2. Substitutions: See Section 016000 - Product Requirements.
- B. Display Case Doors:
 1. Top Channel (110008): 1 3/16 inch by 13/16 inch (30 m by 20.6 mm) aluminum.
 2. Door Guides (419030): Vinyl door guide.
 3. Top Moulding (110024): 7/16 inch by 3/8 inch (11 mm by 10 mm) aluminum.
 4. Door Bumpers (221015): Clear bumper.
 5. Track (110178): 1 3/16 inch by 1/2 inch (30 m by 13 mm) aluminum security track.
 6. Shoe (110140) with End Caps: 7/16 inch by 1 1/2 inch (11 mm by 38 mm) heavy duty aluminum shoe.
 7. Retainers (410381): 3/4 inch (19 mm) security door retainer.
 8. Wheel Assembly (510041): Heavy duty wheel assembly.
 9. Lock (510808): Chrome K-41 plunger lock assembly.
 10. Glazing Tape (119004): 1/4 inch (6 mm) black vinyl glazing tape.
- C. Glass: Provide flat, fully tempered glass for doors.
 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. Thickness: 1/4" inch (6.35 mm).
 3. Edge treatment: Provide bright flat polished edges with routed finger pulls.
 4. Tint: Clear
 5. All glass fabrication to be completed before tempering.
 6. Visible tong marks or tong mark distortions are not permitted in tempered glass.
- D. Fabrication:
 1. General: Fabricate Display Case Door components to designs and sizes indicated on drawings (Field verify all opening dimensions).
 - a. Do not permit cutting, drilling or other alterations to glass after tempering.
 - b. Fabricate work to accommodate required hardware, anchors, reinforcement, and accessory items.
 2. Prefabrication: Complete fabrication, assembly, finishing, hardware application and other work to the greatest extent possible before shipment to the project site. Disassemble components only as necessary for shipment and installation.
 3. Continuity: Maintain accurate relation of planes and angles with hairline fit of contracting members.
- E. Metal Finishes: Satin Clear Anodized

2.02 WALL MOUNTED DISPLAY CASE

- A. Basis of Design Manufacturer:
 1. ONNiT Systems: www.ONNiTsystems.com
 - a. Product: Wall Mount Display Case - 18D.
 2. Substitutions: See Section 01 6000 - Product Requirements.
- B. Glass Display Case: 3 sided glass with aluminum framed case. Includes, 3/8" suspended tempered glass shelves on 1/16" steel cables, top and bottom cable tensioners, 3/8" single sided shelf support, Black PET Felt Sound-Tack surface. Including sliding tempered glass doors with lock, veneer floor, and LED light fixtures by others(see electrical section)
 1. Size: As detailed on Drawings.
 2. Finishes:
 - a. Aluminum: Natural anodized aluminum.
 - b. Black PET Felt Sound Tack Panels : Or as selected by Architect from manufacturer's full range of colors.

2.03 WALL INSERT DISPLAY CASE- SINGLE OR DOUBLE SIDED

- a. Double sided see through display case with 1 side to be fixed glass on the hall

- b. Including but not limited to: 2" x 2" frame, 3/8" suspended tempered glass shelves with polished edges on 1/16" steel cables, top and bottom cable tensioners, 3/8" single sided shelf support brackets, Black PET Felt Sound-Tack tackable surface on side walls. Including sliding tempered glass doors with lock, veneer floor.

2.04 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.

2.05 CLEANING

- A. After installation clean metal and glass surfaces to remove dust, loose fibers, fingerprints, adhesives, and other foreign materials.

2.06 PROTECTION

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

END OF SECTION 10 1200

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**SECTION 10 1400
SIGNAGE**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Room and door signs.
- B. Interior directional and informational signs.
- C. Building identification signs.
- D. Plaque.

1.02 RELATED REQUIREMENTS

- A. Section 26 5100 - Interior Lighting: Exit signs required by code.

1.03 REFERENCE STANDARDS

- A. 36 CFR 1191 - Americans with Disabilities Act (ADA) Accessibility Guidelines for Buildings and Facilities; Architectural Barriers Act (ABA) Accessibility Guidelines; current edition.
- B. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.
- C. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2017.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Manufacturer's printed product literature for each type of sign, indicating sign styles, font, foreground and background colors, locations, overall dimensions of each sign.
- C. Signage Schedule: Provide information sufficient to completely define each sign for fabrication, including room number, room name, other text to be applied, sign and letter sizes, fonts, and colors.
 - 1. When room numbers to appear on signs differ from those on drawings, include the drawing room number on schedule.
 - 2. When content of signs is indicated to be determined later, request such information from Owner through Architect at least 2 months prior to start of fabrication; upon request, submit preliminary schedule.
 - 3. Submit for approval by Owner through Architect prior to fabrication.
- D. Samples: Submit two samples of each type of sign, of size similar to that required for project, illustrating sign style, font, and method of attachment.
- E. Selection Samples: Where colors are not specified, submit two sets of color selection charts or chips.
- F. Manufacturer's Installation Instructions: Include installation templates and attachment devices.
- G. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
 - 1. See Section 01 6000 - Product Requirements, for additional provisions.

1.05 QUALITY ASSURANCE

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Package signs as required to prevent damage before installation.
- B. Package room and door signs in sequential order of installation, labeled by floor or building.
- C. Store tape adhesive at normal room temperature.

1.07 FIELD CONDITIONS

- A. Do not install tape adhesive when ambient temperature is lower than recommended by manufacturer.
- B. Maintain this minimum temperature during and after installation of signs.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Flat Signs:
 - 1. Best Sign Systems, Inc; None - N/A: www.bestsigns.com/#sle.
 - 2. Mohawk Sign Systems, Inc; None - N/A: www.mohawksign.com/#sle.
 - 3. ASI Sign Systems; www.asisignage.com.
 - 4. Innerface Sign Systems; www.innerface-signage.com
 - 5. Mohawk Sign Systems; www.mohawksign.com
 - 6. Vomar Products; www.vomarproducts.com
 - 7. Substitutions: See Section 01 6000 - Product Requirements.
- B. Dimensional Letter Signs:
 - 1. ASI Signage Innovations; www.asisignage.com.
 - 2. APCO Graphics, Inc; www.apcosigns.com.
 - 3. Interface Sign Systems, Inc.; www.innerface-signage.com.
 - 4. Mohawk Sign Systems; www.mohawksign.com
 - 5. Substitutions: See Section 01 6000 - Product Requirements.
- C. Plaques:
 - 1. APCO Graphics, Inc; www.apcosigns.com.
 - 2. ASI Signage Innovations; www.asisignage.com.
 - 3. Gemini, Inc.; www.signletters.com
 - 4. Interface Sign Systems, Inc.; www.innerface-signage.com.
 - 5. Mohawk Sign Systems; www.mohawksign.com
 - 6. Substitutions: See Section 01 6000 - Product Requirements.

2.02 SIGNAGE APPLICATIONS

- A. Accessibility Compliance: Signs are required to comply with ADA Standards and ICC A117.1 2017, unless otherwise indicated; in the event of conflicting requirements, comply with the most comprehensive and specific requirements.
- B. Room and Door Signs: Provide a sign for every doorway, whether it has a door or not, not including corridors, lobbies, and similar open areas.
 - 1. Sign Type: Flat signs with engraved panel media as specified.
 - 2. Provide "tactile" signage, with letters raised minimum 1/32 inch and Grade II braille.
 - 3. Office and Classroom: Identify with room numbers to be determined later, not the numbers indicated on drawings; in addition, provide "window" section for replaceable occupant name.
 - 4. Conference and Meeting Rooms: Identify with room numbers to be determined later, not the numbers indicated on drawings; in addition, provide "window" section with sliding "In Use/Vacant" indicator.
 - 5. Service Rooms: Identify with room names and numbers to be determined later, not those indicated on drawings.
 - 6. Rest Rooms: Identify with pictograms, the names "MEN" and "WOMEN", and braille.
- C. Interior Directional and Informational Signs:
 - 1. Sign Type: Same as room and door signs.
 - 2. Sizes: As indicated on drawings.
 - 3. Wording of signs is scheduled below and locations on the drawings.
- D. Building Identification Signs:
 - 1. Use individual metal letters.
 - 2. Mount on outside wall in location indicated on drawings.
- E. Vinyl Signs:
 - 1. Fabricate letters and numbers to required sizes and styles.
- F. Plaque: See Allowance for details.

2.03 SIGN TYPES

- A. Flat Signs: Signage media without frame.
 - 1. Edges: Square.
 - 2. Corners: Radiused.
 - 3. Clear Cover: For customer produced sign media, provide clear cover of polycarbonate plastic, glossy on back, non-glare on front.
 - 4. Wall Mounting of One-Sided Signs: Tape adhesive.
- B. Color and Font: Unless otherwise indicated:
 - 1. Character Font: Font to be selected and provided by architect.
 - 2. Character Case: Upper case only.
 - 3. Background Color: manufactures full range of colors.
 - 4. Character Color: Contrasting color.

2.04 TACTILE SIGNAGE MEDIA

- A. Engraved Panels: Laminated colored plastic; engraved through face to expose core as background color:
 - 1. Total Thickness: 1/16 inch.

2.05 PLAQUES

- A. Metal Plaques:
 - 1. Metal: Aluminum casting.
 - 2. Metal Thickness: 1/8 inch, minimum.

2.06 DIMENSIONAL LETTERS

- A. Metal Letters:
 - 1. Metal: Aluminum casting.
 - 2. Finish: Brushed, satin.
 - 3. Mounting: Concealed screws.

2.07 ACCESSORIES

- A. Concealed Screws: Stainless steel, galvanized steel, chrome plated, or other non-corroding metal.
- B. Tape Adhesive: Double sided tape, permanent adhesive.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that substrate surfaces are ready to receive work.

3.02 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install neatly, with horizontal edges level.
- C. Locate signs and mount at heights indicated on drawings and in accordance with ADA Standards and ICC A117.1.
- D. Protect from damage until Date of Substantial Completion; repair or replace damaged items.
- E. Where signs are installed on glass provide a blank plate of equal size on opposite side of glass to conceal adhesive.

3.03 SIGNAGE SCHEDULE

- A. See site drawings C-101 - C-106 for site sign locations and sign types on C-501.
- B. See interior finish drawing sheets for building sign locations.
- C. Verify final room numbers with owner.

3.04 SIGNAGE GRAPHICS

- A. See site drawings C-501 for site sign types.

B. See building signage graphics in drawings A-681.

END OF SECTION 10 1400

**SECTION 10 1453
TRAFFIC SIGNAGE**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Traffic signs.

1.02 REFERENCE STANDARDS

- A. 36 CFR 1191 - Americans with Disabilities Act (ADA) Accessibility Guidelines for Buildings and Facilities; Architectural Barriers Act (ABA) Accessibility Guidelines; current edition.
- B. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.
- C. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2017.

1.03 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Manufacturer's printed product literature for each type of sign, indicating sign styles, font, foreground and background colors, locations, overall dimensions of each sign.
- C. Selection Samples: Where colors are not specified, submit two sets of color selection charts or chips.
- D. Manufacturer's Installation Instructions: Include installation templates and attachment devices.

1.04 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years of documented experience.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Package signs as required to prevent damage before installation.

PART 2 PRODUCTS

2.01 SIGNAGE APPLICATIONS

- A. Accessibility Compliance: Signs are required to comply with ADA Standards and ICC A117.1 2017, unless otherwise indicated; in the event of conflicting requirements, comply with the most comprehensive and specific requirements.
- B. Traffic Signs: Handicapped/Accessible Parking Sign
 1. Locate where indicated on drawings.
 2. Graphic design as detailed on Drawings.
 3. Size: 12 inches x 14 inches x .063 inch aluminum blank.
 4. Design: Symbol and lettering silk-screened on blank.
 5. Finish: Baked enamel.
 6. Lettering Design: Helvetica Medium.
 7. Posts: 2 inch square steel tube shop primed and painted.
- C. Traffic Signs: Stop, Speed Limit, and Directional, etc. Signs
 1. Locate where indicated on drawings.
 2. Size and type as indicated on Drawings.
 3. Size and Design: conform to requirements of "Manual on Uniform Traffic Control Devices".
 4. Finish: as indicated on Drawings and conforming to the requirements of the "Manual on Uniform Traffic Control Devices".
 5. Lettering Design: as indicated on Drawings and conforming to the requirements of the "Manual on Uniform Traffic Control Devices".
 6. Posts: 2 inch square standard galvanized post. Quality Standard: Tel Spar or approved equal.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that substrate surfaces are ready to receive work.

3.02 INSTALLATION

- A. Install in accordance with manufacturer's latest published requirements, specifications and details, and as indicated.
- B. Set steel posts as indicated on Drawings.
- C. Obtain City's approval of sign format and installation where required.

3.03 SIGNAGE SCHEDULE

- A. See approved drawings for location, type, and installation details.

END OF SECTION 10 1453

**SECTION 10 2113.17
PHENOLIC TOILET COMPARTMENTS**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Phenolic toilet and shower compartments.
- B. Urinal and vestibule screens.

1.02 RELATED REQUIREMENTS

- A. Section 10 2800 - Toilet, Bath, and Laundry Accessories.

1.03 REFERENCE STANDARDS

- A. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2023.
- B. NFPA 286 - Standard Methods of Fire Tests for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth; 2024.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Coordination: Coordinate the work with placement of support framing and anchors in walls and ceilings.

1.05 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on panel construction, hardware, and accessories.
- C. Shop Drawings: Indicate partition plan, elevation views, dimensions, details of wall supports, door swings.
- D. Samples: Submit two samples of partition panels, ____by____ inch in size illustrating panel finish, color, and sheen.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Phenolic Toilet Compartments:
 - 1. Laminating Technologies, Laminatingtech.com
 - 2. Substitutions: Section 01 6000 - Product Requirements.

2.02 PHENOLIC TOILET COMPARTMENTS

- A. Toilet Compartments: Factory fabricated doors, pilasters, and divider panels made of solid phenolic core panels with integral melamine finish, floor-to-ceiling.
 - 1. Color: Single color as selected.
- B. Doors:
 - 1. Thickness: 3/4 inch.
 - 2. Width: 24 inch.
 - 3. Width for Handicapped Use: 36 inch, out-swinging.
 - 4. Height: 58 inch.
- C. Panels:
 - 1. Thickness: 1/2 inch.
 - 2. Height: 58 inch.
- D. Pilasters:
 - 1. Thickness: 3/4 inch.
 - 2. Width: As required to fit space; minimum 3 inch.
- E. Screens: Without doors; to match compartments; mounted to wall with two panel brackets with vertical support/bracing same as compartments.

2.03 ACCESSORIES

- A. Pilaster Shoes: Formed ASTM A666 Type 304 stainless steel with No. 4 finish, 3 inch high, concealing floor fastenings.
- B. Wall and Pilaster Brackets: Polished stainless steel; manufacturer's standard type for conditions indicated on drawings.
- C. Attachments, Screws, and Bolts: Stainless steel , tamper proof type.
 - 1. For attaching panels and pilasters to brackets: Through-bolts and nuts ; tamper proof.
- D. Hardware: Polished stainless steel:
 - 1. Pivot hinges, gravity type, adjustable for door close positioning; two per door.
 - 2. Door Latch: Slide type with exterior emergency access feature.
 - 3. Door strike and keeper with rubber bumper; mounted on pilaster in alignment with door latch.
 - 4. Coat hook with rubber bumper; one per compartment, mounted on door.
 - 5. Provide door pull for outswinging doors.
 - 6. 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 installation with exposed fasteners.
 - a. Products:
 - 1) [American Specialties, Inc; None - N/A:][www.americanspecialties.com/#sle].
 - 2) [Bradley Corporation; None - N/A:][www.bradleycorp.com/#sle].
 - 3) [Bobrick: www.bobrick.com].
 - 4) Scranton Products
 - 5) Substitutions: Section 01 6000 - Product Requirements.
 - 7. Shower Curtain:
 - a. Material: Opaque vinyl, 0.008 inch thick, matte finish, with antibacterial treatment, flameproof and stain-resistant.
 - b. Grommets: Corrosion-resistant metal; pierced through top hem on 6 inch centers.
 - c. Color: White.
 - d. Shower Curtain Hooks: Chrome-plated or stainless steel spring wire designed for snap closure.
 - e. Manufacturers:
 - 1) [American Specialties, Inc; None - N/A:][www.americanspecialties.com/#sle].
 - 2) [Bradley Corporation; None - N/A:][www.bradleycorp.com/#sle].
 - 3) [Bobrick: www.bobrick.com].
 - 4) Scranton Products
 - 5) Substitutions: Section 01 6000 - Product Requirements.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that field measurements are as indicated.
- B. Verify correct location of built-in framing, anchorage, and bracing.

3.02 INSTALLATION

- A. Install partitions secure, rigid, plumb, and level in accordance with manufacturer's instructions.
- B. Maintain 3/8 inch to 1/2 inch space between wall and panels and between wall and end pilasters.
- C. Attach panel brackets securely to walls using anchor devices.
- D. Attach panels and pilasters to brackets. Locate head rail joints at pilaster center lines.

3.03 TOLERANCES

- A. Maximum Variation From True Position: 1/4 inch.
- B. Maximum Variation From Plumb: 1/8 inch.

3.04 ADJUSTING

- A. Adjust and align hardware to uniform clearance at vertical edge of doors, not exceeding 3/16 inch.
- B. Adjust hinges to position doors in partial opening position when unlatched. Return out-swinging doors to closed position.
- C. Adjust adjacent components for consistency of line or plane.

END OF SECTION 10 2113.17

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**SECTION 10 2601
WALL AND CORNER GUARDS**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Corner guards.

1.02 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Indicate physical dimensions.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Wall and Corner Guards:
 - 1. Babcock-Davis; None - N/A: www.babcockdavis.com/#sle.
 - 2. Construction Specialties, Inc; None - N/A: www.c-sgroup.com/#sle.
 - 3. Inpro; None - N/A: www.inprocorp.com/#sle.
 - 4. Substitutions: See Section 01 6000 - Product Requirements.

2.02 COMPONENTS

- A. Corner Guards - Surface Mounted:
 - 1. Material: Type 304 stainless steel, No. 4 finish, None - N/A gage, .0625 inch thick.
 - 2. Performance: Resist lateral impact force of 100 lbs at any point without damage or permanent set.
 - 3. Width of Wings: 2 inches.
 - 4. Corner: 1/8" radius.
 - 5. Length: One piece 48 inches high.

2.03 FABRICATION

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that rough openings, concealed blocking, and anchors are correctly sized and located.
- B. Verify that field measurements are as indicated on drawings.

3.02 INSTALLATION

- A. Install components in accordance with manufacturer's instructions, level and plumb, secured rigidly in position to wall framing members only.
- B. Position corner guard 4 inches above finished floor to 52 inches high.
- C. Install at all corridor locations that do not have a wainscot, or CMU.

3.03 TOLERANCES

- A. Maximum Variation From Required Height: 1/4 inch.

END OF SECTION 10 2601

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**SECTION 10 2800
TOILET, BATH, AND LAUNDRY ACCESSORIES**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Commercial toilet accessories.
- B. Commercial shower and bath accessories.
- C. Diaper changing stations.
- D. Utility room accessories.

1.02 RELATED REQUIREMENTS

- A. Section 09 2216: Concealed supports for accessories, including in wall framing and plates.
- B. Section 10 2113.16 - Plastic-Laminate-Clad Toilet Compartments.
- C. Section 22 4000 - Plumbing Fixtures: Under-lavatory pipe and supply covers.

1.03 REFERENCE STANDARDS

- A. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.
- 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; 2022.
- D. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2023.
- E. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2023.
- F. ASTM B86 - Standard Specification for Zinc and Zinc-Aluminum (ZA) Alloy Foundry and Die Castings; 2023.
- G. ASTM B456 - Standard Specification for Electrodeposited Coatings of Copper Plus Nickel Plus Chromium and Nickel Plus Chromium; 2017 (Reapproved 2022).
- H. ASTM C1036 - Standard Specification for Flat Glass; 2021.
- I. ASTM C1503 - Standard Specification for Silvered Flat Glass Mirror; 2024.
- J. ASTM F2285 - Standard Consumer Safety Performance Specification for Diaper Changing Tables for Commercial Use; 2022.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Coordinate the work with the placement of internal wall reinforcement, concealed ceiling supports, and reinforcement of toilet partitions to receive anchor attachments.

1.05 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Submit data on accessories describing size, finish, details of function, and attachment methods.
- C. Samples: Submit two samples of each accessory, illustrating color and finish.
- D. Manufacturer's Installation Instructions: Indicate special procedures and conditions requiring special attention.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Commercial Toilet, Shower, and Bath Accessories:
 - 1. American Specialties, Inc; None - N/A: www.americanspecialties.com/#sle.
 - 2. Bradley Corporation; None - N/A: www.bradleycorp.com/#sle.

3. Bobrick: www.bobrick.com.
4. Substitutions: Section 01 6000 - Product Requirements.

2.02 MATERIALS

- A. Accessories - General: Shop assembled, free of dents and scratches and packaged complete with anchors and fittings, steel anchor plates, adapters, and anchor components for installation.
 1. Grind welded joints smooth.
 2. Fabricate units made of metal sheet or seamless sheets with flat surfaces.
- B. Keys: Provide 2 keys for each accessory to Owner; master key lockable accessories.
- C. Stainless Steel Sheet: ASTM A666, Type 304.
- D. Stainless Steel Tubing: ASTM A269/A269M, Grade TP304 or TP316.
- E. Galvanized Sheet Steel: Hot-dipped galvanized steel sheet, ASTM A653/A653M, with G90/Z275 coating.
- F. Zinc Alloy: Die cast, ASTM B86.
- G. Mirror Glass: Annealed float glass, ASTM C1036 Type I, Class 1, Quality Q2, with silvering, protective and physical characteristics complying with ASTM C1503.
- H. Adhesive: Two component epoxy type, waterproof.
- I. Fasteners, Screws, and Bolts: Hot dip galvanized; tamper-proof; security type.
- J. Expansion Shields: Fiber, lead, or rubber as recommended by accessory manufacturer for component and substrate.

2.03 FINISHES

- A. Stainless Steel: Satin finish, unless otherwise noted.
- B. Chrome/Nickel Plating: ASTM B456, SC 2, polished finish, unless otherwise noted.
- C. Baked Enamel: Pretreat to clean condition, apply one coat primer and minimum two coats epoxy baked enamel.
- D. Galvanizing for Items Other than Sheet: Comply with ASTM A123/A123M; galvanize ferrous metal and fastening devices.
- E. Shop Primed Ferrous Metals: Pretreat and clean, spray apply one coat primer and bake.
- F. Back paint components where contact is made with building finishes to prevent electrolysis.

2.04 COMMERCIAL TOILET ACCESSORIES

- A. Toilet Paper Dispenser: Owner furnished, Contractor installed.
- B. Paper Towel Dispenser: Owner furnished, Contractor installed.
- C. Soap Dispenser: Owner furnished, Contractor installed.
- D. Mirrors: Stainless steel framed, 1/4 inch thick annealed float glass; ASTM C1036.
 1. Annealed Float Glass: Silvering, protective and physical characteristics in compliance with ASTM C1503.
 2. Size: as shown on the drawings.
 3. Frame: 0.05 inch angle shapes, with mitered and welded and ground corners, and tamperproof hanging system; satin finish.
 4. Backing: Full-mirror sized, minimum 0.03 inch galvanized steel sheet and nonabsorptive filler material.
- E. Grab Bars: Stainless steel, smooth surface.
 1. Heavy Duty Grab Bars: Floor supports are acceptable if necessary to achieve load rating.
 - a. Push/Pull Point Load: Minimum 1000 pound-force, minimum.
 - b. Dimensions: 1-1/2 inch outside diameter, minimum 0.125 inch wall thickness, exposed flange mounting, 1-1/2 inch clearance between wall and inside of grab bar.
 - c. Length and Configuration: As indicated on drawings.

- F. Combination Sanitary Napkin/Tampon Dispenser with Disposal: Stainless steel, surface-mounted.
 - 1. Door: Seamless 0.05 inch door with returned edges and tumbler lock.
 - 2. Cabinet: Fully welded, 0.03 inch thick sheet.
 - 3. Operation: 25 cent coin required to operate dispenser. Provide locked coin box, separately keyed.
 - 4. Identify dispensers slots without using brand names.
 - 5. Minimum capacity: 15 napkins and 20 tampons.
- G. Sanitary Napkin Disposal Unit: Stainless steel, surface-mounted, self-closing door, locking bottom panel with full-length stainless steel piano-type hinge, removable receptacle.

2.05 COMMERCIAL SHOWER AND BATH ACCESSORIES

- A. Folding Shower Seat: Wall-mounted surface; welded tubular seat frame, structural support members, hinges, and mechanical fasteners of Type 304 stainless steel, L-shaped, right hand and L-shaped, left hand seat.
 - 1. Seat: Phenolic or polymeric composite one-piece seat or seat slats, of Ivory color.
 - 2. Size: ADA Standards compliant.
- B. Wall-Mounted Soap Dish: Heavy duty, seamless stainless steel, surface-mounted with drain holes, without grab bar, satin finish; with concealed mechanical fastening suitable for substrate and backplate.
- C. Robe Hook: Heavy-duty stainless steel, double-prong, rectangular-shaped bracket and backplate for concealed attachment, satin finish.

2.06 UNDER-LAVATORY PIPE AND SUPPLY COVERS

- A. Specified in 22 4000 - Plumbing Fixtures.

2.07 DIAPER CHANGING STATIONS

- A. Diaper Changing Station: Wall-mounted folding diaper changing station for use in commercial toilet facilities, meeting or exceeding ASTM F2285.
 - 1. Material: Polyethylene.
 - 2. Mounting: Surface.
 - 3. Color: Gray.
 - 4. Minimum Rated Load: 250 pounds.

2.08 UTILITY ROOM ACCESSORIES

- A. Mop and Broom Holder: 0.05 inch thick stainless steel, Type 304, hat-shaped channel.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Verify exact location of accessories for installation.
- C. Verify that field measurements are as indicated on drawings.

3.02 PREPARATION

- A. Deliver inserts and rough-in frames to site for timely installation.
- B. Provide templates and rough-in measurements as required.

3.03 INSTALLATION

- A. Install accessories in accordance with manufacturers' instructions in locations indicated on drawings.
- B. Install plumb and level, securely and rigidly anchored to substrate.
- C. Mounting Heights: As required by accessibility regulations, unless otherwise indicated.
 - 1. Grab Bars: As indicated on drawings.
 - 2. Other Accessories: As indicated on drawings.

3.04 PROTECTION

- A. Protect installed accessories from damage due to subsequent construction operations.

END OF SECTION 10 2800

**SECTION 10 4116
EMERGENCY KEY CABINETS**

PART 1 GENERAL

1.01 SUMMARY

- A. Work required for this section includes fire department key keeper and supplementary items necessary for their proper installation.

1.02 QUALITY ASSURANCE

- A. Local Authority Approval: Obtain approval of local fire department for keyway access and exact location of key keeper box prior to product data submittal.
- B. Key keeper will be required at entrances to the following:
 - 1. Building entrance designated by the fire department.

1.03 SUBMITTALS

- A. Product Data: Manufacturer's product data, marked specifically to indicate compliance with these specifications.
- B. Samples: 3 inch square sample of exposed metal to indicate compliance with finish specified.

PART 2 PRODUCTS

2.01 KEY KEEPER

- A. Product Standard: Knox Co. "Knox Box" 3200 Series. Provide with sub key and marked by Fire Marshal.
- B. Size: As follows:
 - 1. Surface Mount: 5 inches wide, 4 inches high, 3 inches deep.
- C. Finish: Manufacturer's standard weather resistant polyester powder coat.
 - 1. Color: As selected from manufacturer's standard colors.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install in accordance with manufacturer's latest published requirements and where directed by Fire Marshal.

END OF SECTION 10 4116

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**SECTION 10 4400
FIRE PROTECTION SPECIALTIES**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Fire extinguishers.
- B. Fire extinguisher cabinets.
- C. Accessories.

1.02 RELATED REQUIREMENTS

- A. Section 09 2116 Gypsum Board Assemblies: Roughed-in wall openings.

1.03 REFERENCE STANDARDS

- A. ASTM E814 - Standard Test Method for Fire Tests of Penetration Firestop Systems; 2023a.
- B. FM (AG) - FM Approval Guide; Current Edition.
- C. NFPA 10 - Standard for Portable Fire Extinguishers; 2022.
- D. UL (DIR) - Online Certifications Directory; Current Edition.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide extinguisher operational features.
- C. Shop Drawings: Indicate locations of cabinets and cabinet physical dimensions.
- D. Manufacturer's Installation Instructions: Indicate special criteria and wall opening coordination requirements.
- E. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

1.05 FIELD CONDITIONS

- A. Do not install extinguishers when ambient temperature may cause freezing of extinguisher ingredients.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Fire Extinguishers:
 - 1. Ansul, a Tyco Business; None - N/A: www.ansul.com/#sle.
 - 2. Fire Engineering Co.; www.fireengineering.com.
 - 3. JL Industries; www.jlindustries.com
 - 4. Larsen's Manufacturing Co; www.larsensmfg.com/#sle.
 - 5. Substitutions: See Section 01 6000 - Product Requirements.
- B. Fire Extinguisher Cabinets and Accessories:
 - 1. Ansul, a Tyco Business; None - N/A: www.ansul.com/#sle.
 - 2. Larsen's Manufacturing Co; AL 2409-6R or AL FS 2409-6R: www.larsensmfg.com/#sle.
 - 3. JL Industries; jlindustries.com.
 - 4. Substitutions: See Section 01 6000 - Product Requirements.

2.02 FIRE EXTINGUISHERS

- A. Fire Extinguishers - General: Comply with product requirements of NFPA 10 and applicable codes, whichever is more stringent.
 - 1. Provide extinguishers labeled by UL (DIR) or FM (AG) for purpose specified and as indicated.
- B. Multipurpose Dry Chemical Type Fire Extinguishers: Carbon steel tank, with pressure gauge.
 - 1. Stored Pressure Operated: Deep Drawn.
 - 2. Size: 10 pound.
 - 3. Finish: Baked polyester powder coat, red color.

- C. Dry Chemical Type Fire Extinguishers: Stainless steel tank, with pressure gauge.
 - 1. Class: K type.
 - 2. Size: 1.6 gallons.
 - 3. Finish: Polished stainless steel.

2.03 FIRE EXTINGUISHER CABINETS

- A. Fire Rating: Listed and labeled in accordance with ASTM E814 requirements for fire resistance rating of walls where being installed.
- B. Cabinet Construction: Non-fire rated.
 - 1. Formed aluminum; ____ inch thick base metal.
- C. Fire Rated Cabinet Construction: One-hour fire rated.
 - 1. Steel; double wall or outer and inner boxes with 5/8 inch thick fire barrier material.
- D. Cabinet Configuration: Semi-recessed type.
 - 1. Size to accommodate accessories.
 - 2. Trim: Flat rolled edge, with 1-1/2 inch wide face.
- E. Door: 0.036 inch metal thickness, reinforced for flatness and rigidity with lock and breakable window access. Hinge doors for 180 degree opening with continuous piano hinge.
- F. Door Glazing: Tempered glass, clear, 1/8 inch thick, and set in resilient channel glazing gasket.
- G. Cabinet Mounting Hardware: Appropriate to cabinet, with pre-drilled holes for placement of anchors.
- H. Fabrication: Weld, fill, and grind components smooth.
- I. Finish of Cabinet Interior: White colored enamel.

2.04 ACCESSORIES

- A. Extinguisher Brackets: Formed steel, chrome-plated.
- B. Extinguisher Theft Alarm: Battery operated alarm, 10 second delay for disarming, activated by opening cabinet door.
- C. Cabinet Signage: FIRE EXTINGUISHER.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Verify rough openings for cabinet are correctly sized and located.

3.02 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Secure rigidly in place.
- C. Place extinguishers in cabinets.

END OF SECTION 10 4400

**SECTION 10 5100
LOCKERS**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Metal lockers.
- B. Locker benches.

1.02 RELATED REQUIREMENTS

- A. Section 03 3000 - Cast-in-Place Concrete: Concrete base construction.
- B. Section 06 1000 - Rough Carpentry: Wood base construction.
- C. Section 06 1000 - Rough Carpentry: Wood blocking and nailers.

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; 2023.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Manufacturer's published data on locker construction, sizes and accessories.
- C. Shop Drawings: Indicate locker plan layout, numbering plan.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Protect locker finish and adjacent surfaces from damage.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Metal Lockers:
 - 1. Art Metal Products; None - N/A: www.artmetalproducts.com/#sle.
 - 2. Lyon Workspace Products; None - N/A: www.lyonworkspace.com/#sle.
 - 3. Penco Products, Inc; None - N/A: www.pencoproducts.com/#sle.
 - 4. Republic Storage Systems Co; None - N/A: www.republicstorage.com/#sle.
 - 5. Substitutions: See Section 01 6000 - Product Requirements.

2.02 LOCKER APPLICATIONS

- A. Student Lockers: Two tier metal lockers, recessed mounted.
 - 1. Width: 12 inches.
 - 2. Depth: 12 inches.
 - 3. Height: 72 inches.
 - 4. Fittings: Hat shelf at ADA lockers, 2 coat hooks.
 - 5. Locking: Built-in combination locks.
 - 6. Provide sloped top.
- B. PE Lockers: Five tier metal lockers, On 4" preinstalled concrete curb - wall mounted or back to back as per plan.
 - 1. Width: 12 inches.
 - 2. Depth: 12 inches.
 - 3. Height: 72 inches.
 - 4. Locking: Padlock hasps, for padlocks provided by Owner.
 - 5. Provide sloped top.
- C. Kitchen Lockers: Two tier metal lockers, wall mounted with matching closed base.
 - 1. Width: 12 inches.
 - 2. Depth: 12 inches.
 - 3. Height: 72 inches.

4. Fittings: shelf at 15" at ADA lockers, 2 side coat hooks, and one double prong ceiling hook.
 5. Locking: Padlock hasps, for padlocks provided by Owner.
 6. Provide sloped top.
- D. Locker Room Benches: Stationary type; Honed CMU Base with precast concrete cap. See drawings for details.
1. Height: 18 inches
 2. Length: Varies as indicated on drawings.

2.03 METAL LOCKERS

- A. Lockers: Factory assembled, made of formed sheet steel, ASTM A653/A653M SS Grade 33/230, with G60/Z180 coating, stretcher leveled; metal edges finished smooth without burrs; baked enamel finished inside and out.
1. Where ends or sides are exposed, provide flush panel closures.
 2. Provide filler strips where indicated, securely attached to lockers.
 3. Color: Custom allow up to six (6) different colors.
 4. Pattern: As indicated on drawings.
- B. Locker Body: Formed and flanged; with steel stiffener ribs; electric spot welded.
1. Body and Shelves:
 - a. At Student Lockers: 24 gage body/shelves, 24 gage backing
 - b. At PE Lockers: 16 gage body/shelves, 18 gage backing
 - c. At Athletic Lockers: 16 gage body/shelves, 18 gage backing
 - d. At Coaches Lockers: 16 gage body/shelves, 18 gage backing
 - e. At Kitchen Lockers: 24 gage body/shelves, 24 gage backing
- C. Frames: Formed channel shape, welded and ground flush, welded to body, resilient gaskets and latching for quiet operation.
1. Door Frame: 16 gage, 0.0598 inch, minimum.
- D. Doors: Hollow channel edge construction, 1 inch thick minimum; welded construction, channel reinforced top and bottom with intermediate stiffener ribs, grind and finish edges smooth.
1. Door Metal thickness:
 - a. At Student Lockers: 16 gage doors
 - b. At PE Lockers: 14 gage doors
 - c. At Athletic Lockers: 14 gage doors
 - d. At Coaches Lockers: 14 gage doors
 - e. At Kitchen Lockers: 16 gage doors
 2. Form recess for operating handle and locking device.
 3. Provide ventilation louvers in top and bottom of face of door at student and kitchen lockers. Doors at PE, Athletic, and Coaches office to be diamond perforated metal.
- E. Hinges: Two for doors under 42 inches high; three for doors over 42 inches high; weld securely to locker body and door.
1. Hinge Thickness: 14 gage, 0.0747 inch.
- F. Sloped Top: 20 gage, 0.0359 inch, with closed ends.
- G. Trim: 20 gage, 0.0359 inch.
- H. Number Plates: Provide oval shaped brass plates. Form numbers 1/2 inch high of block font style with ADA designation, in contrasting color.
- I. Locking device supplied by Owner at athletic, coaches, PE, and kitchen lockers.
- J. Student lockers are to be supplied with a built in combination lock, five (5) combinations available, master key controlled. Provide ADA compliant locks at ADA lockers.
- K. Base:
1. Continuous Z base - except at Athletic Team and P.E. lockers.
 2. Pre-poured 4 inch concrete base only at Athletic Team and P.E. lockers. Concrete curb by others.

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. PE Lockers: Install alternating 2-tier and 6-tier in sequence.
- B. Install in accordance with manufacturer's instructions.
- C. Install lockers plumb and square.
- D. Place and secure on prepared base.
- E. Secure lockers with anchor devices to suit substrate materials. Minimum Pullout Force: 100 lb.
- F. Bolt adjoining locker units together to provide rigid installation.
- G. Install end panels.
- H. Install accessories.
- I. Replace components that do not operate smoothly.

3.03 CLEANING

- A. Clean locker interiors and exterior surfaces.

END OF SECTION 10 5100

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**SECTION 10 7500
FLAGPOLES**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Aluminum Flagpoles.

1.02 RELATED REQUIREMENTS

- A. Section 03 3000 - Cast-in-Place Concrete: Concrete base and foundation construction.

1.03 REFERENCE STANDARDS

- A. AASHTO M 36 - Standard Specification for Corrugated Steel Pipe, Metallic-Coated, for Sewers and Drains; 2016 (Reapproved 2020).
- B. ASTM B241/B241M - Standard Specification for Aluminum and Aluminum-Alloy Seamless Pipe and Seamless Extruded Tube; 2022.
- C. NAAMM FP 1001 - Guide Specifications for Design Loads of Metal Flagpoles; 2007.

1.04 PERFORMANCE REQUIREMENTS

- A. Structural Performance: Provide flagpole assemblies, including anchorages and supports, capable of withstanding the effects of wind loads, determined according to NAAMM FP 1001, "Guide Specifications for Design of Metal Flagpoles."
 - 1. Base flagpole design on polyester, nylon or cotton flags of maximum standard size suitable for use with flagpole or flag size indicated, whichever is more stringent.
 - 2. Basic Wind Speed: 90 mph (40 m/s)]; 3-second gust speed at 33 feet (10 m) aboveground.

1.05 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on pole, accessories, and configurations.
- C. Shop Drawings: Indicate detailed dimensions, base details, anchor requirements, and imposed loads.
- D. Structural Calculations: For flagpoles indicated to comply with design loads, include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
- E. Finish Samples for Verification: For each finished material used for flagpoles and accessories.

1.06 QUALITY ASSURANCE

- A. Source Limitations: Obtain flagpole as a complete unit, including fittings, accessories, bases, and anchorage devices, from a single manufacturer.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Spiral wrap flagpole with protective covering and pack in protective shipping tubes or containers.
- B. Protect flagpole and accessories from damage or moisture.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Flagpoles:
 - 1. American Flagpole: www.americanflagpole.com/#sle.
 - 2. Concord Industries, Inc: www.concordindustries.com/#sle.
 - 3. Substitutions: See Section 01 6000 - Product Requirements.

2.02 FLAGPOLES

- A. Flagpoles: Designed in accordance with NAAMM FP 1001
 - 1. Material: Aluminum.

2. Design: Cone tapered.
3. Mounting: Ground mounted type.
4. Outside Butt Diameter: 7 inches.
5. Outside Tip Diameter: 3 inches.
6. Nominal Wall Thickness: 188 inches.
7. Nominal Height: 35 ft; measured from adjacent nominal ground elevation.
8. Halyard: Interior type.

2.03 POLE MATERIALS

- A. Aluminum: ASTM B241/B241M , 6063 alloy , T6 temper.

2.04 ACCESSORIES

- A. Finial Ball: Aluminum, 6 inch diameter.
- B. Truck Assembly: Cast aluminum; revolving, stainless steel ball bearings, non-fouling.
- C. Flag: US Flag design, 6 ft by 10 ft size, nylon fabric, brass grommets, hemmed edges.
- D. Cleat Box: Aluminum, with built-in hinge and hasp assembly, attached to pole with tamper proof screws inside box.
- E. Halyard: 5/16 inch diameter stainless steel aircraft cable.

2.05 OPERATORS

- A. Hand Crank: Removable type.

2.06 MOUNTING COMPONENTS

- A. Foundation Tube Sleeve: AASHTO M 36, corrugated 16 gage, 0.0598 inch steel, galvanized, depth of 60 inches as indicated.
- B. Lighting Ground Rod: 12 inch long steel rod, 3/4 inch diameter.

2.07 FINISHING

- A. Aluminum: Mill finish.
- B. Finial: Spun finish.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that concrete foundation is ready to receive work and dimensions are as indicated on shop drawings.

3.02 PREPARATION

- A. Coat metal sleeve surfaces below grade and surfaces in contact with dissimilar materials with asphaltic paint.

3.03 INSTALLATION

- A. Install flagpole , base assembly, and fittings in accordance with manufacturer's instructions.
- B. See Section on Architectural Site drawings for placement of anchor devices and foundation sleeve.
- C. Fill foundation tube sleeve with concrete specified in Section 03 3000.
- D. Install foundation plate and centering wedges for flagpoles base set in concrete base and fasten.

3.04 TOLERANCES

- A. Maximum Variation From Plumb: 1 inch.

3.05 ADJUSTING

- A. Adjust operating devices so that halyard and flag function smoothly.

END OF SECTION 10 7500

**SECTION 11 3013
RESIDENTIAL APPLIANCES**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Kitchen appliances - Owner Provided / Contractor Installed.
- B. Laundry appliances - Owner Provided / Contractor Installed.

1.02 RELATED REQUIREMENTS

- A. Section 22 1005 - Plumbing Piping: Plumbing connections for appliances.
- B. Section 26 0583 - Wiring Connections: Electrical connections for appliances.

PART 2 PRODUCTS

2.01 KITCHEN APPLIANCES

2.02 LAUNDRY APPLIANCES

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify utility rough-ins are provided 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 equipment to provide efficient operation.

3.04 CLEANING

- A. Remove packing materials from equipment and properly discard.
- B. Wash and clean equipment.

END OF SECTION 11 3013

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SECTION 114000 - FOOD SERVICE EQUIPMENT

PART 1 - GENERAL

1.01 Conditions:

All the applicable requirements of Division 0 and Division 1 apply to the work of this section.

1.02 This specification and the accompanying drawings must be considered together; any work called for in one or on the other, together with such work as can reasonably be considered a part of the installation and necessary to complete same shall be included.

1.03 Scope:

A. Work included: It is the intention of these specifications to designate an inclusive job, complete, ready to use, except plumbing, heating and electrical connections which shall be made by other contractors. All equipment shall be set in place, leveled, and after utility connections have been made, ready for use.

B. Uniformity of Construction: All specially built equipment shall be made by one manufacturer, and shall be uniform throughout as to method and type of construction used. All equipment shall carry a nameplate identifying the manufacturer.

C. Bid Performance: All bidders must show evidence of their ability to perform the contract and must be regular furnishers and fabricators of such equipment.

D. Specifications, Substitutions: The successful contractor will be bound to furnish equipment in strict accordance with the specifications, including specific manufacturer, model number, size, utilities requirements, capacities, etc., as well as options and accessories. Supplemental to the base bid for the prime equipment as specified, the Food Service Contractor may propose substitution (alternate) equipment other than that specified. The Contractor must clearly and separately state that they are offering an alternate. The Contractor shall submit complete illustrations, capacities, and utilities, as well as all operational data for all proposed alternates as well as applicable price differences. It is the Contractor's responsibility to prove that the item or items submitted as alternatives are equal to the prime specified items. The Owner with counsel from the Food Service Consultant will be the final determining authority as to acceptability or equality of alternates. Items of standard equipment must be the latest model and new at time of delivery. Approval prior to the bid date to submit alternates is not required. At a time requested in writing by the Owner and/or the Foodservice Consultant, the Contractor will be responsible for determining all relative costs associated with the use of alternate equipment. Should substitution be accepted and should the substitute material, specialty or manufactured article prove to be defective or otherwise unsatisfactory for the service intended and with the guarantee period, the Contractor shall replace this material, specialty or manufactured article with that specified.

E. Equipment Protection: All equipment shall be received at the building fully protected. It will be the responsibility of the Kitchen Contractor to protect the equipment until completely installed.

F. Building Codes, Regulations, National Sanitation Foundation Standards: All kitchen equipment shall be manufactured and installed in compliance with all city, state and Federal regulations and code requirements, and in accordance with the latest revised standard of the National Sanitation Foundation Testing Laboratory, Ann Arbor, Michigan, and shall bear their seal of approval.

G. Field Dimensions: The Contractor shall be required to take all field measurements and be responsible therefor. It shall also be the duty of this contractor to coordinate the location of chases and passageways for supply lines in the building. It is recommended that where time does not permit the use of finished field dimensions in fabrication of this equipment, that measurements be determined by General Contractor & Architect and then given to the Kitchen Contractor in writing.

H. Refrigeration Units: All refrigeration units, hereinafter specified, are to be completely installed by the Food Service Equipment Contractor except for final electric, water (if water connections are specified) and drain units, the Food Service Equipment Contractor shall furnish necessary charge of refrigerant, start and adjust equipment and service same for a period of one year final acceptance by the Owner.

1.04 Related Work in Other Sections:

A. Plumbing: Plumbing connections to equipment will be provided under another section of the specifications including shutoff valves, piping and sink traps necessary to connect up after equipment is installed in place. The Food Service Equipment Contractor shall furnish all necessary faucets and sink drains.

The steam and gas connection of equipment shall be provided in another section of the specifications, which will include all final connections to the equipment with the shutoff valves and the supply and return.

B. Electrical: The electrical contractor will furnish disconnect switches and do all wiring to motor starters, motors, automatic controls, protective devices, etc. The Food Service Equipment Contractor shall supply, for each motor driven appliance, for electrically heated units, a suitable control switch or starter of proper type in accordance with Underwriters Code. Loose controls or switches furnished with brand name equipment are to be completely installed by Electrical Contractor.

All electrical equipment shall be correct for the type of electrical current available.

1.05 Supervision and Instruction:

A. Supervision: The Food Service Equipment Contractor shall visit the job site to check mechanical rough-ins prior to the pouring of the floor slabs and advise the General Contractor of any discrepancy. Cost to relocate or add utility lines due to the failure of the Food Service Equipment Contractor to verify their proper location prior to the pouring of the floor slabs will be assumed by said Food Service Contractor.

Food Service Equipment Contractor shall remove all debris accumulated during the delivery and installation of his equipment immediately upon completion of said installation. He will provide a representative, when necessary, to correlate final hook-up related contractors, so as not to impede job progress. After final hook-up, he shall lubricate, start up and check all equipment turn over to the Owner, for acceptance, in first class condition, all items in his contract.

The Food Service Equipment Contractor shall provide a capable representative or representatives to demonstrate the proper use of the equipment, at the times selected by the Owner. The Owner is to give said Food Service Equipment Contractor a minimum of seven calendar days prior to this demonstration date.

B. Final Adjustment and Instructions to Owner:

1. When directed by the Architect at completion of this work, provide a competent service representative to be present when installation is put into operation.
2. Lubricate, clean with soap and water and put into proper operation all equipment and instruct the Owner's employees in the proper use and maintenance of all items in this contract, and set up a maintenance schedule to be followed thereafter.
3. Prepare a letter documenting the fact that instructional work has been accomplished, obtain signature of the Owner thereon, and submit to the Architect before final acceptance of the installation will be considered.
4. Furnish four bound sets of specification sheets of all standard manufactured items complete with service manuals and parts lists, to the Architect, along with shop drawings showing the plan and all mechanical and electrical hookups as installed.

1.06 Guarantee:

The Food Service Equipment Contractor shall fully guarantee all work and material for a period of one year from the date the equipment is put into operation and accepted by the Owner.

Guarantee and condition of service on items of brand name manufacture, as established by the manufacturer, shall apply where extending beyond the guarantee and services set forth in these specification.

PART 2 - PRODUCTS AND PART 3 - EXECUTION

2.01 Stainless Steel: All Stainless steel shall be of the gauge specified (U.S. Standard) 18-8 composition which is generally known as Type 302 or Type 304 and shall have a Number 4 finish, as manufactured within the continental limits of the United States. All sheets will have a genuine mill finish of not less than 180 grit on one side with not less than 100 grit on the back side. All stainless steel sheets which bear the manufacturer's trademark designation of type and heat number. All stainless shall have the following content:

Chromium -18 per cent minimum

Nickel -8 per cent minimum

Carbon -2 tenths per cent maximum

Straight chrome iron or copper bearing straight chrome iron will not be acceptable. All stainless steel sheets shall be stretcher leveled. All sheets shall be free of buckles, warps and surface imperfections. Bidders are particularly cautioned that a hard ground finished will not be acceptable.

2.02 Galvanized Iron: Wherever specified, iron shall be of an approved grade of wither low carbon steel or copper bearing steel to one of the following brands:

All sheets are to be commercial quality, stretcher level, bonderized and rerolled to insure a smooth surface.

Where galvanized iron is specified, it shall be copper bearing sheets used in the largest sizes with as few joints as possible. All welded joints are to be sandblasted and refinished with rustproof galvanized zinc compound. All galvanized iron it to be finished with a prime coat plus two finished coats of gray hammerloid enamel.

2.03 Welding: All welding shall be done in a thorough manner with all welds of the same composition as sheets or parts welded. Welds shall have full penetration the entire length of the joint and shall be flat without buckles, voids or imperfections. Welds shall be strong, ductile, with excess metal ground off and joints finished smooth to match the adjoining surface. Welds shall be of the same color as the adjacent metal, ground and polished on the exposed side and ground on the back side. Welds to be free of imperfections such as pits, runs, splatter, cracks, etc. All joints in the tops of fixtures, drainboards, shelving, sinks, etc. shall not be welded with the carbon arc welding or by any method permitting carbon pickup. Soldering riveting, bolting or spot welding of seams in tops is not acceptable for full arc welding. It is the intention of this specification that all welded joints shall be homogenous with the sheet metal itself.

2.04 Grinding, Polishing and Finishing: All exposed welded joints, including field joints, shall be suitable ground flush with the adjoining material and neatly finished to harmonize with same. Wherever material has been depressed or sunken in by the welded operation, such depressions shall be suitably hammered and peened flushed with the adjoining surfaces and, if necessary, again ground to eliminate low spots. All ground surfaces shall then be polished or buffed to match adjoining surfaces, consistent with good workmanship. Care shall be exercised in all grinding operations to avoid excessive heating of the metal and metal discoloration. In all cases

the grain of rough grinding shall be removed by successive finer polishing operations. The texture of the final polishing operation shall be uniform and smooth, consistent with reasonable care and good workmanship. The general finish of all metal shall be of a high grade. Wherever break bends occur they shall be free of open texture or orange peel appearance: and where such break work does not mar the uniformity of the appearance of the material, all such marks shall be removed by suitable grinding, polishing and finishing. Wherever sheared edges occur, they shall be free of burrs, projections and fins to obviate all danger of cutting and laceration when the hand is drawn over such sheared edges. Where miters of bullnose corners occur, they shall be neatly finished with the under edges of the material neatly ground to a uniform condition and in no case shall overlapping material be acceptable.

ITEM 1 - THREE (3) COMPARTMENT SINK (1 REQ'D)

Advance Tabco Model 94-83-60-24RL

Regaline Sink, 3-compartment, with left & right-hand drainboards, 28" front-to-back x 20"W sink compartments, 14" deep, with 11"H backsplash, stainless steel legs with adjustable left-to-right and front cross rails, 24" drainboards, 1" adjustable bullet feet, 14 gauge 304 stainless steel, overall 36" F/B x 115" L/R, NSF

Alternate Mfg: Custom, John Boos

3 ea Model K-15 Lever Waste Drain, twist handle operated with built in overflow, fits 3-1/2" drain opening, 2" NPT & 1-1/2" IPS outlet connections

3 ea Model K-4 Support Bracket, for lever waste drain handle, (1) support required for each lever drain

ITEM 1.1 - WALL / SPLASH MOUNT FAUCET (2 REQ'D)

T&S Brass Model B-0231-CR

Faucet, 12" swing nozzle, 8" wall mount base, 1/2" NPT female Inlets, quarter-turn Cerama cartridges, low lead, ADA Compliant

2 kt Model B-0230-KIT Inlet Kit, 1/2" NPT nipple, close elbows, 24" flex supply hoses

ITEM 2 - SHELVING, WALL MOUNTED (1 REQ'D)

Advance Tabco Model WS-12-120

Shelf, wall-mounted, 120"W x 12"D, 1-5/8" bullnose front edge, 1-1/2"H rear up-turn, 18/430 satin finish stainless steel, NSF (units 84" & longer have (3) support brackets)

Alternate Mfg: Custom

ITEM 3 - HAND SINK (4 REQ'D)

John Boos Model PBHS-W-1410

Pro-Bowl Hand Sink, wall mount, 14"W x 10" front-to-back x 5" deep bowl, splash mount faucet holes with 4" centers, 1-7/8" drain opening with basket drain, includes mounting bracket, all stainless steel construction, NSF, CSA-Sanitation (faucet NOT included)

4 ea T&S Brass Model B-0342 Faucet, splash mounted, rigid gooseneck, 4" OC, 1/2" IPS female with flange, lever handles, 5-1/4" center line of body to tip of outlet, 10-1/4" to top, 6" spread, Eterna cartridges, low lead, ADA Compliant

ITEM 4 - BUN / SHEET PAN RACK (1 REQ'D)

Winholt Equipment Model AL-1820B

Cache County School District

Pan Rack, mobile, full height, open sides, with slides for (40) 14" x 18" or (20) 18" x 26" sheet pans capacity, welded angle-type aluminum frame, end loading, 5" casters, NSF

ITEM 5 - PROOFER CABINET, MOBILE (2 REQ'D)

Cres Cor Model 121PHUA11D

Proofer/Hot Cabinet, non-insulated, removable bottom heater, wire universal slides for 12" x 20" thru 18" x 26" pans, on 4-1/2" centers, adjustable on 1-1/2", capacity (11) 18" x 26" sheet pans or (22) 12" x 20" pans, aluminum construction, field reversible Lexan door, integral drip trough, (4) 5" swivel casters (2) braked, CSA, cCSAus

2 ea , 6' 12/3 ga. power cord, standard

2 ea Right-hand door swing, standard

ITEM 6 - DOUGH DIVIDER (1 REQ'D)

Dutchess Bakers Model BMIH-36

Dough Divider, manual, 36-piece (1 oz. - 4 oz. each), (1) stainless steel pan, white powder coated finish, NSF, USDA

1 ea 2 years parts & labor warranty, standard

1 ea Model B4-436-0072 Portable Stand with shelf for BMIH models

ITEM 7 - PLANETARY MIXER (1 REQ'D)

Hobart Model HL200-1STD

; Bench type mixer; with bowl, beater, whip & spiral dough arm, US/EXP configuration - Legacy Planetary Mixer, Bench, 20 quart, (3) fixed speeds plus stir speed, gear-driven transmission, 15-minute SmartTimer™, #12 taper hub, manual bowl lift, stainless steel bowl, aluminum "B" beater, stainless steel "D" wire whip, aluminum "ED" spiral dough arm, stainless steel bowl guard, 1/2 hp, cord with plug

1 ea Model TABLEHW-HL2012 Mixer Table; 27"W x 32"D x 26"H, the top shelf is drilled for mounting an HL120 or HL200 mixer, includes 4 posts for storing attachments, a lower shelf for additional storage, & (4) locking 5" diameter wheels

ITEM 8 - WORK TABLE, STAINLESS STEEL TOP (1 REQ'D)

Advance Tabco Model TSS-488

Work Table, 96"W x 48"D, 14 gauge 304 stainless steel top, stainless steel legs with center & side crossrails, adjustable stainless steel bullet feet, NSF

Alternate Mfg: Custom, John Boos

ITEM 8.1 - INGREDIENT BIN (8 REQ'D)

Cambro Model IBS27148

Ingredient Bin, mobile, 27 gallon capacity, 1-pc seamless polyethylene bin, 2-pc sliding polycarbonate lid, scoop holder included (scoop sold separately), (4) 3" heavy duty casters (2 front swivel, 2 fixed), white with clear cover, NSF

1 ea Model SCP12CW135 Camwear® Scoop, 12 oz., polycarbonate, clear, NSF

1 ea Model SCP24CW135 Camwear® Scoop, 24 oz., polycarbonate, clear, NSF

1 ea Model SCP64CW135 Camwear® Scoop, 64 oz., polycarbonate, clear, NSF

ITEM 8.2 - POT RACK (1 REQ'D)

Advance Tabco Model SC-84

Cache County School District

Pot Rack, ceiling hung, triple bar design, 84"W x 22"D, constructed of 1/4" x 2" stainless steel, includes: (18) plated double pot hooks & 24" plated hanging chains

ITEM 9 - HD RANGE, 18", 2 OPEN BURNERS (1 REQ'D)

Vulcan Model V2B18B

V Series Heavy Duty Range, gas, 18", (2) 35,000 BTU open burners, cast iron grates, storage base with cabinet doors, stainless steel front, front top ledge, sides, base, burner box & stub back, 6" adjustable legs, 70,000 BTU, CSA, NSF

1 ea Natural gas (specify elevation if over 2,000 ft.)

1 ea Model PRESREG-NA11/4 1-1/4" NPT pressure regulator (Natural gas)

1 ea 1-1/4" rear gas connection, standard

1 ea Rear gas connection: cap & cover, both ends

1 kt Dormont Model 1675KIT48 Dormont Blue Hose™ Moveable Gas Connector Kit, 3/4" inside dia., 48" long, covered with stainless steel braid, coated with blue antimicrobial PVC, (1) SnapFast® QD, (1) full port valve, (2) 90° elbows, coiled restraining cable with hardware, 180,000 BTU/hr minimum flow capacity, limited lifetime warranty

ITEM 10 - CONVECTION OVEN, GAS (2 REQ'D)

Southbend Model SLGS/22SC

(QUICK SHIP) SilverStar Convection Oven, gas, double-deck, standard depth, solid state controls, stainless steel front, top & sides, aluminized steel rear, 60/40 dependent doors, interior light, 6" stainless steel legs, 144,000 BTU, (2) 1/2 HP, CSA, NSF (Ships within 2 days, maximum quantity = 2 per order)

2 ea Quick Ship items have limited configurations & that standard configuration may not apply.
Contact factory for details

2 ea Domestic Shipping, inside of North America

2 ea Natural Gas

2 ea Standard power system

2 ea (2) , standard

1 kt Dormont Model 1675KIT48 Dormont Blue Hose™ Moveable Gas Connector Kit, 3/4" inside dia., 48" long, covered with stainless steel braid, coated with blue antimicrobial PVC, (1) SnapFast® QD, (1) full port valve, (2) 90° elbows, coiled restraining cable with hardware, 180,000 BTU/hr minimum flow capacity, limited lifetime warranty

ITEM 11 - SHELVING, DRY STORAGE (1 It REQ'D)

Olympic

Super Adjustable Super Erecta® wire shelving, chrome plated finish, corner release system, NSF

85 ea Model J2448C Shelf, wire, 24" x 48", chromate finish, NSF

68 ea Model J74C Post 74", stationary, grooved at 1" intervals, includes leveling bolt & cap, chrome finish, NSF

ITEM 11.1 - DUNNAGE RACK (4 REQ'D)

Metro Model HP2248PD

Quick Ship - Metro Bow-Tie™ Dunnage Rack, 22" x 48" x 12"H, slotted, with separate polymer tie for joining racks, corrosion proof polymer construction, NSF

ITEM 12 - SHELVING, WALK-IN (14 It REQ'D)

Metro Model -

Shelving, walk-in

- 4 ea Model A2448NK3 Quick Ship - Super Adjustable Super Erecta® Shelf, wire, 48"W x 24"D, Metroseal 3 (corrosion-resistant) finish, corner release system, with Microban® antimicrobial protection, NSF
- 52 ea Model A2460NK3 Quick Ship - Super Adjustable Super Erecta® Shelf, wire, 60"W x 24"D, Metroseal 3 (corrosion-resistant) finish, corner release system, with Microban® antimicrobial protection, NSF
- 56 ea Model 63PK3 Quick Ship - Super Erecta® SiteSelect™ Post, 62-7/16"H, adjustable leveling bolt, posts are grooved at 1" increments & numbered at 2" increments, double grooved every 8", Metroseal 3 Green epoxy coated corrosion-resistant finish with Microban® antimicrobial protection

ITEM 13 - CORNER GUARDS (19 REQ'D)

Custom Model -

Corner guards, 16 gauge 304 stainless steel, 3" x 3" x 72" long, 3" x wall width x 3" x 72" long per details.

Utilities: None

Installation Notes: Provide at all outside wall corners in kitchen area. Attach to wall as required as per plan.

ITEM 14 - CAN OPENER (1 REQ'D)

Edlund Model 266/115V

Can Opener, electric, single speed, recommended usage is up to 75 cans per day

ITEM 15 - KETTLE, GAS, TILTING (1 REQ'D)

Vulcan Model K40GLT

Tilting Kettle, Gas, 40-gallon true working capacity, 2/3 jacketed, 316 series stainless steel liner with ellipsoidal bottom, manual tilt, faucet bracket on tilting console, stainless steel construction, tri-leg base, 100,000 BTU

- 1 ea Natural gas (specify elevation if over 2,000 ft.)
- 1 ea cord, standard
- 1 ea NOTE: This unit includes: embossed gallon/liter markings, 316 stainless steel liner & heavy bar rim standard
- 1 ea Model KTD0V PLUG2 K Series Plug Draw-off valve, 2" with perforated strainer
- 1 ea Model STRAINR DPS40 Perforated Strainer, for draw-off valve, for K40
- 1 ea Model SACOVER K40GLT Spring assist cover with condensate ring, field installed
- 1 ea Model STRAINR K40 Tilting kettle pouring lip strainer, 40 gallon
- 1 ea Model SUPPORT PANGLT Stainless steel receiving pan support (K tilt kettles, gas)
- 1 ea Model 20X4 DRNPAN Drain pan & hose assembly
- 1 ea Model DBLTS 18NZLJ DOUBLE Pantry Deck-Mount Faucet, 18" double jointed swivel spout, includes 4" & 12" riser, NSF & Lead Reduction Compliant (Note: water connection required)

ITEM 16 - FLOOR TROUGH (1 REQ'D)

John Boos Model FTSG-1836-X

Floor Trough, 36"W x 18"D, subway-style stainless steel grating, 4" deep all-welded drain pan with built-in pitch, accommodates up to a 4" diameter pipe, includes stainless steel removable perforated strainer, 14/300 stainless steel (Available in Effingham and Nevada)

ITEM 17 - FOOD PROCESSOR, BENCHTOP / COUNTERTOP (1 REQ'D)

Hobart Model FP100-1B

Food Processor, angled continuous feed design, half-size hopper, 11 lb per/min production cap., 420 rpm, stainless steel cutting surfaces, planetary gear transmission, triple safety interlocks, aluminum housing, rubber feet, includes plate package PLTSS-6PACK, 1/3 HP, UL, NSF

Single speed model

ITEM 18 - COMBI OVEN, GAS (2 REQ'D)

RATIONAL Model ICP 6-FULL ON 6-FULL NG 208/240V 1 PH

Two (2) (CC1GRRR.0000238) iCombi Pro® 6-Full Size Combi Ovens, double stack, natural gas, (12) 18" x 26" sheet pan or (24) 12" x 20" steam pan or (12) 2/1 GN pan capacity, (6) stainless steel grids included, intelligent cooking system with (4) assistants; iDensityControl, iCookingSuite, iProductionManager, & iCareSystem, (6) operating modes, (5) cooking methods, (3) manual operating modes, 85° to 572°F temperature range, quick clean, care control, eco mode, 6-point core temperature probe, retractable hand shower, Ethernet interface, Wi-Fi enabled, 106,500 BTU each, 208/6 ft. cord, each, CE, IPX5, cCSAus, NSF, ENERGY STAR-®

2 kt Model 60.75.752 Combi-Duo Universal Stacking Kit, for iCombi 6-half size or 6-full size (electric or gas) on iCombi 6-full size (gas only)

2 ea NOTE: All discounts subject to approval by manufacturer

2 ea Model CAP Chef Assistance Program, a RATIONAL certified Chef conducts 4 hours/location specialized application training with personnel, no charge

2 ea Model 1900.1150US Water Filtration Double Cartridge System, for full-size Combi-Duos or if used for more than (2) units, includes: (1) double head with pressure gauge, (2) R95-CL filter & (1) filter installation kit (for each additional unit add (1) additional head & additional cartridge. Maximum (4) cartridges)

2 ea NOTE: The RATIONAL Water Filtration Systems helps provide consistent high quality water to your RATIONAL cooking systems. The patented carbon block technology reduces the effects of sediment, chloramines and chlorine while providing the required flow rates

ITEM 19 - WORK TABLE, STAINLESS STEEL TOP (1 REQ'D)

Advance Tabco Model VSS-368

Work Table, 96"W x 36"D, 14 gauge 304 stainless steel top with countertop non drip edge, adjustable stainless steel undershelf, stainless steel legs & adjustable bullet feet, NSF

1 ft Model TA-94 16 gauge 304 stainless steel undershelf upgrade (per linear foot)

2 ea Model SHD-2020 Drawer, 20"W x 20"D x 5" deep drawer pan insert, heavy duty, self-closing, stainless steel, NSF

ITEM 19.1 - WORK TABLE, STAINLESS STEEL TOP (1 REQ'D)

Advance Tabco Model VSS-368

Work Table, 96"W x 36"D, 14 gauge 304 stainless steel top with countertop non drip edge, adjustable stainless steel undershelf, stainless steel legs & adjustable bullet feet, NSF

1 ft Model TA-94 16 gauge 304 stainless steel undershelf upgrade (per linear foot)

Cache County School District

- 2 ea Model SHD-2020 Drawer, 20"W x 20"D x 5" deep drawer pan insert, heavy duty, self-closing, stainless steel, NSF
- 1 ea Model TA-228-3 Mid mounting provision for 96" or longer
- 1 ea Model SCT-96 Pot Rack, table mounted, circular design, 96" long, stainless steel, includes: (18) plated pot hooks & (1) AUR-96 utensil rack

ITEM 20 - SPARE NO. <Spare No.>

ITEM 21 - PLANETARY MIXER (1 REQ'D)

Hobart Model HL300-1STD

Mixer; with bowl, beater, & "D" whip; US/EXP configuration - Legacy Planetary Mixer, 3/4 hp, 30 quart capacity, (3) fixed speeds, gear-driven transmission, 15-Minute SmartTimer™, #12 taper attachment hub, manual bowl lift, bowl guard, stainless steel bowl, "B" beater, "D" whip

1 ea Model TRUCK-HL4030 Legacy® Mixer Bowl Truck, aluminum, for 30 & 40 quart mixers

ITEM 22 - TWO (2) COMPARTMENT SINK (1 REQ'D)

Advance Tabco Model 94-42-48-36RL

Regaline Sink, 2-compartment, with left & right-hand drainboards, 24" front-to-back x 24"W sink compartment, 14" deep, with 11"H backsplash, stainless steel legs with adjustable left-to-right and front cross rails, 36" drainboards, stainless steel bullet feet, 14 gauge 304 stainless steel, overall 32" F/B x 125" L/R, NSF

2 ea Model K-15 Lever Waste Drain, twist handle operated with built in overflow, fits 3-1/2" drain opening, 2" NPT & 1-1/2" IPS outlet connections

ITEM 22.1 - PRE-RINSE FAUCET ASSEMBLY, WITH ADD ON FAUCET (1 REQ'D)

T&S Brass Model 5PR-8WWS12

Equip Pre-Rinse Unit, 8" centers, wall mount faucet, wall bracket, 12" add-on-faucet, wrist action handles, quarter-turn Cerama cartridges, low lead

ITEM 22.2 - SHELVING, WALL MOUNTED (1 REQ'D)

Advance Tabco Model WS-12-48

Shelf, wall-mounted, 48"W x 12"D, 1-5/8" bullnose front edge, 1-1/2"H rear up-turn, 18/430 satin finish stainless steel, NSF

ITEM 22.3 - PRE-RINSE FAUCET ASSEMBLY, WITH ADD ON FAUCET (1 REQ'D)

T&S Brass Model 5PR-8WWS12

Equip Pre-Rinse Unit, 8" centers, wall mount faucet, wall bracket, 12" add-on-faucet, wrist action handles, quarter-turn Cerama cartridges, low lead

ITEM 23 - HAND SINK (1 REQ'D)

John Boos Model PBHS-W-1410

Pro-Bowl Hand Sink, wall mount, 14"W x 10" front-to-back x 5" deep bowl, splash mount faucet holes with 4" centers, 1-7/8" drain opening with basket drain, includes mounting bracket, all stainless steel construction, NSF, CSA-Sanitation (faucet NOT included)

1 ea T&S Brass Model B-0342 Faucet, splash mounted, rigid gooseneck, 4" OC, 1/2" IPS female with flange, lever handles, 5-1/4" center line of body to tip of outlet, 10-1/4" to top, 6" spread, Eterna cartridges, low lead, ADA Compliant
Provide with right side splash

ITEM 24 - PASS-THRU REFRIGERATOR (2 REQ'D)

True Manufacturing Co., Inc. Model STA2RPT-2S-2S-HC

SPEC SERIES® Refrigerator, pass-thru, two-section, (2) stainless steel doors front & rear with locks, cam-lift hinges, digital temperature control, (6) chrome shelves, LED interior lights, stainless steel front & sides, aluminum interior, 5" castors, R290 Hydrocarbon refrigerant, 1/2 HP, cULus, UL EPH Classified, Made in USA

2 ea Thermometer side: Left door hinged on left, right door hinged on right, standard
2 ea Rear: Left door hinged on left, right door hinged on right, standard
2 st 5" castors (set of 4), standard

ITEM 25 - PASS-THRU HEATED CABINET (2 REQ'D)

True Manufacturing Co., Inc. Model STA2HPT-2S-2S

SPEC SERIES® Heated Cabinet, pass-thru, two-section, (2) stainless steel doors front & rear with locks, cam-lift hinges, digital temperature control, (6) chrome shelves, stainless steel front & sides, aluminum interior, 5" castors, (requires hard wiring), cULus, UL EPH Classified, Made in USA

2 ea Thermometer side: Left door hinged on left, right door hinged on right, standard
2 ea Rear: Left door hinged on left, right door hinged on right, standard
2 ea (3) chrome shelves & shelf supports standard per section
2 st 5" castors (set of 4), standard

ITEM 26 - ICE MAKER, CUBE-STYLE (1 REQ'D)

Manitowoc Model IYT0450A

Indigo NXT™ Series Ice Maker, cube-style, air-cooled, self-contained condenser, 30"W x 24"D x 21-1/2"H, production capacity up to 490 lb/24 hours at 70°/50° (378 lb AHRI certified at 90°/70°), easyTouch display with 13 different language options, date/time stamp display, automatic reminder/alert icon, one touch asset information, automatic detection of accessories, continuous operating status, programmable production options (time, weight, day or night), one touch cleaning with displayed instructions, Alpha-San anti-microbial protection, acoustical ice sensing probe, self-diagnostic technology, DuraTech™ exterior, half-dice size cubes, Refrigerant, NSF, cULus, CE, ENERGY STAR®

1 ea (-161)
1 ea Legs, 6" adjustable stainless steel, standard
1 ea Everpure Model EV932401 Insurice® Water Filtration System, Insurice® Single-i2000², Single, (1) i2000² Micro-Pure® II Precoat primary filtration cartridge, reduces chlorine, taste & odor, inhibits scale, outlet pressure gauge, flushing valve, 9,000 gallons, 1.67 gpm, 0.5 micron, 3/8" inlet, 3/8" outlet, NSF 42 & 53 (EV932401)
Alternate Mfg: Scotsman

ITEM 26.1 - ICE BIN FOR ICE MACHINES (1 REQ'D)

Manitowoc Model D400

Cache County School District

Ice Bin, 30"W x 34"D x 38"H, with side-hinged front-opening door, side grips, 365 lbs. application capacity, AHRI certified 12.3 cu. ft., for top-mounted ice maker, Duratech exterior, NSF
1 ea Legs, 6" adjustable stainless steel, standard

ITEM 27 - WORK TABLE, STAINLESS STEEL TOP (1 REQ'D)

Advance Tabco Model KSS-3010

Work Table, 120"W x 30"D, 14 gauge 304 stainless steel top with 5"H backsplash, 18 gauge stainless steel adjustable undershelf, stainless steel legs with stainless steel bullet feet, NSF

2 ea Model SHD-1520 Drawer, 15"W x 20"D x 5" deep drawer pan insert, heavy duty, self-closing, stainless steel, NSF

1 pr Model TA-90 Drawer Adapter/Non Catalog Tables, specify table width (pair)

2 ea Model SHD-2020 Drawer, 20"W x 20"D x 5" deep drawer pan insert, heavy duty, self-closing, stainless steel, NSF

ITEM 28 - SERVING COUNTER - MAIN ENTREE (1 REQ'D)

Custom Model -

Custom Serving Counter to be constructed size and shape as shown. Countertop to be 14 gauge stainless steel to overhang body 1 " on back side. Top reinforced with 1 1/2" x 1 1/2" x 1/8" hot rolled steel angle iron frame studded to underside and welded to cabinet body. Underbracing not to exceed 30" centers. Counter body to be constructed of 18 gauge, type 304, stainless steel. Counter to be 36" high with tray slide at 34" A.F.F. to comply with ADA requirements, with body enclosed on front and ends. Counter to be mounted on 6" high stainless steel legs.

Utilities: None.

Installation Notes: Set-in-place as shown on plans.

ITEM 28.1 - SNEEZE GUARD (2 REQ'D)

Custom

Sneeze Guard as per detail- See detail

ITEM 29 - SERVING COUNTER - PIZZA & POTATOS (1 REQ'D)

Custom Model -

Custom Serving Counter to be constructed size and shape as shown. Countertop to be 14 gauge stainless steel to overhang body 1 " on back side. Top reinforced with 1 1/2" x 1 1/2" x 1/8" hot rolled steel angle iron frame studded to underside and welded to cabinet body. Underbracing not to exceed 30" centers. Counter body to be constructed of 18 gauge, type 304, stainless steel. Counter to be 36" high with tray slide at 34" A.F.F. to comply with ADA requirements, with body enclosed on front and ends. Counter to be mounted on 6" high stainless steel legs.

Utilities: None.

Installation Notes: Set-in-place as shown on plans.

ITEM 29.1 - SNEEZE GUARD (1 REQ'D)

Custom

Sneeze Guard as per detail- See Detail in 4 sections

ITEM 30 - HOT FOOD WELL UNIT, DROP-IN, ELECTRIC (3 REQ'D)

Hatco Model HWBI-4MA

Drop-In Modular/Ganged Heated Well, with manifold drains & auto-fill, (4) full size pan capacity, insulated, top mounted, remote thermostat with separate power switch, stainless steel & Aluminized construction (standard watt), CE, cULus, UL EPH Classified, Made in USA

3 ea

3 ea Single remote control configuration

3 ea Model HWBI-BOTTOM Copper Manifold drain with bottom exit, 1" NPT, field selectable left or right side (not available on HWBI-1 or 120v units) (available at time of purchase only)

3 ea Model BALLVALVE1INCH High Temperature NPT Ball Valve, 1", for units with drains & manifold (ganged heated wells only)

3 ea 23-5/8" bezel depth, standard

ITEM 31 - SPARE NO. <Spare No.>

ITEM 32 - MILK COOLER (3 REQ'D)

True Manufacturing Co., Inc. Model TMC-49-HC

Mobile Milk Cooler, forced-air, (12) 13" x 13" x 11-1/8" crate capacity, stainless steel drop front/hold-open flip-up lid with lock, 33 - 38°F temperature range, (3) heavy-duty floor racks, digital thermometer, white vinyl exterior, aluminum interior with stainless steel floor, R290 Hydrocarbon refrigerant, 4" castors, 1/5 HP, cULus, UL EPH Classified, Made in USA, ENERGY STAR®

3 ea NOTE: Commonly stocked model in stainless steel exterior; verify availability with factory

3 ea Self-contained refrigeration standard

3 ea 4" Castors, standard

ITEM 33 - DISHTABLE, WITH POTSINKS (1 REQ'D)

Custom Model DISHTABLE WITH SINK

Dishtable with 3-compartment sink, size and shape per plan, with left & right-hand drainboards, 28" front-to-back x 20"W sink compartments, 14" deep, with 11"H backsplash,

Construction to be in accordance with NSF standard No. 2

Top to be fabricated to 14 gauge, type 304, stainless steel with a No.4 polished finish. Cove all corners on 5/8" radius. Front edge to have 3" high rolled rim. Edges adjacent to walls to have 11" high backsplash with 2" return at 45 degrees to wall and flanged down 3/4". Top to be reinforced with 1 1/2"x1 1/2"x1/2" hot rolled steel angle studded to underside. Underbracing not to exceed 30" centers. Tables to be supported on 1 5/8" O.D. stainless steel tubular legs fitted with NSF approved adjustable bullet feet of like material. Legs to fit in sanitary, die-stamped, reinforced stainless steel gussets, welded to 12 gauge stainless steel triangle gusset plates. Gusset Plates to be heliarc welded to top. Cross rails of 1 5/8" O.D., 16 gauge stainless steel tubing to be heliarc welded in place 10" above floor with welds ground smooth. Leg sections not to exceed 65" centers. Provide with 16 ga. under shelf as shown on elevation.

Installation Notes: Set & Level as Per Plan Clip and seals splash to wall.

Cache County School District

- 1 ea Advance Tabco Model K-15 Lever Waste Drain, twist handle operated with built in overflow, fits 3-1/2" drain opening, 2" NPT & 1-1/2" IPS outlet connections
- 1 ea Advance Tabco Model K-4 Support Bracket, for lever waste drain handle, (1) support required for each lever drain

ITEM 33.1 - WALL / SPLASH MOUNT FAUCET (2 REQ'D)

T&S Brass Model B-0231-CR

Faucet, 12" swing nozzle, 8" wall mount base, 1/2" NPT female Inlets, quarter-turn Cerama cartridges, low lead, ADA Compliant

ITEM 34 - DISHWASHER, CONVEYOR TYPE (1 REQ'D)

Hobart Model CL54EN-BAS+BUILDUP

Conveyor Dishwasher, single tank, (245) racks/hour, insulated hinged doors, .56 gallon/rack, stainless steel enclosure panels, controls with low temperature & dirty water indicators, NSF Pot & Pan mode, programable de-lime notification, ENERGY STAR®, Free factory startup for installations within a 100 mile radius of a Hobart service office; installation beyond 100 miles will be charged at the quoted rate by the local Hobart service office

- 1 ea Oversized units with crated shipping dimensions greater or equal to 72" in length and/or 90" in height. If delivery is to a facility without a standard height dock, additional shipping charges will apply depending on the service requested. consult Factory.
- 1 ea Model CL54EN-BASHT15K Electric tank heat
- 1 ea Model CL54EN-BASERH0NO Without internal booster
- 1 ea Single Point (1) service connection standard (Field convertible options available)
- 1 ea Model CL54EN-BASELE0AX
- 1 ea Model CL54EN-BASHGTSTD Standard height
- 1 ea Model CL54EN-BASDIR0LR Left to right operation
- 1 ea Model CL54EN-BASFETSTD Standard feet
- 1 ea Model CLE/TBL-SWITCH Table limit switch CLE-Series

ITEM 34.1 - BOOSTER HEATER, ELECTRIC (1 REQ'D)

Hubbell Water Heaters Model J615

Booster Heater, electric, 6-gallon storage capacity, ASME stamped stainless steel tank with CFC/HCFC free closed cell foam insulation, electronic display controller with low water cut-off & leak detection, stainless steel exterior, pressure reducing valve with by-pass, T&P gauge, T&P relief valve, adjustable plastic legs, UL, cUL, ASME, UL EPH (ANSI/NSF 5)

- 1 ea Model J615R

ITEM 35 - SOILED DISHTABLE WITH PASS THRU WINDOW (1 REQ'D)

Custom Model DIRTY DISHTABLE

Soiled dishtable with pass thru window.

Size shape per plan Construction to be in accordance with NSF standard No. 2

Top to be fabricated to 14 gauge, type 304, stainless steel with a No.4 polished finish. Cove all corners on 5/8" radius. Front edge to have 3" high rolled rim. Edges adjacent to walls to have 10" high backsplash with 2" return at 45 degrees to wall an flanged down 3/4". Top to be reinforced with 1 1/2"x1 1/2"x1/2" hot rolled steel angle studded to underside. Underbracing not to exceed 30" centers. Angle reinforcement to be sound deadened with hard drying, petroleum base mastic. Undercoating painted with two coats of aluminum colored enamel. Tables to be supported on 1 5/8" O.D. stainless steel tubular legs fitted with NSF approved adjustable bullet feet of like material. Legs to fit in sanitary, die-stamped,

reinforced stainless steel gussets, welded to 12 gauge stainless steel triangle gusset plates. Gusset Plates to be heliarc welded to top. Cross rails of 1 5/8" O.D., 16 gauge stainless steel tubing to be heliarc welded in place 10" above floor with welds ground smooth. Leg sections not to exceed 65" centers. Provide Pass-Thru Shelf through wall opening, as shown with front edge to have 1/2" high, die formed, marine edge turned 2" at 90 degrees. Sides to turn up thru wall opening. Wall Opening to be cased with S/S. backsplash to be capped at opening. Provide 18 gauge, type 304, stainless steel channels fabricated to fit wall opening as required. Weld and polished to a No. 4 finish.

Quick drain trough with perf. insert. 5" wide x 24" long x 1" deep. 14 gauge, type 304 stainless steel coved corner construction.
Provide with cutout for Item 36 collector

Utilities: 1 1/2" indirect waste to floor sink
Installation Notes:
Set & Level as Per Plan
Clip and seal splash to wall.

ITEM 36 - WASTE COLLECTOR (1 REQ'D)

Salvajor Model S914

Scrap Collector™, scrapping, pre-flushing & collecting system (widely accepted in areas where disposers are restricted), NEMA 4 HYDROLOGIC® control panel with patented operator sensor, two water saving modes (timed run & auto start/stop), safety line disconnect, LCD readout, salvage basin & silverware trap, scrap basket, 3/4 HP corrosion-resistant pump, pump intake screen, stainless steel construction, UL, CSA, CE, NSF

1 ea Collector top is available to ship to the fabricator in advance of unit (additional shipping charges will apply). Please provide instructions on order

1 ea

ITEM 37 - HAND SINK (1 REQ'D)

John Boos Model PBHS-W-1410

Pro-Bowl Hand Sink, wall mount, 14"W x 10" front-to-back x 5" deep bowl, splash mount faucet holes with 4" centers, 1-7/8" drain opening with basket drain, includes mounting bracket, all stainless steel construction, NSF, CSA-Sanitation (faucet NOT included)

1 ea T&S Brass Model B-0342 Faucet, splash mounted, rigid gooseneck, 4" OC, 1/2" IPS female with flange, lever handles, 5-1/4" center line of body to tip of outlet, 10-1/4" to top, 6" spread, Eterna cartridges, low lead, ADA Compliant

ITEM 38 - HOSE REEL (1 REQ'D)

T&S Brass Model B-7232-U05XS1E

Hose Reel Assembly, open, 3/8" x 35 ft. hose with high flow spray valve with swivel, 8" wall mount mixing faucet, adjustable centers, quarter-turn Eterna compression cartridges with spring checks, lever handles with color coded indexes, continuous pressure vacuum breaker, 36" flexible water hose connector with stainless steel quick disconnect, ratcheting system, multi-fit bracket & adjustable hose bumper, (2) 2-3/8" wall brackets, EasyInstall 16" & 40" risers, epoxy coated steel hose reel, polished chrome-plated brass faucet body, 1/2" NPT female inlets

1 ea Model MV-2516-24 Water Gun, rear trigger, 5/16" orifice, without coupling, stainless steel, blue rubber cover

1 ea Model G019430-45 EasyInstall Universal Hose Reel Swing Bracket, fits 1/2" & 3/8" hose reels, includes mounting hardware, stainless steel

ITEM 39 - PRE-RINSE FAUCET ASSEMBLY (1 REQ'D)

T&S Brass Model B-0133-CR-BJ-SW

EasyInstall Pre-Rinse Unit, wall mount base mixing faucet with 8" adjustable centers, quarter-turn Cerama cartridges & check valves, chrome-plated lever handles with color coded indexes, EasyInstall 18" riser, 44" flexible stainless steel hose with heat-resistant gray handle & hold down ring, 1.07 GPM spray valve, 6" wall bracket, 1/2" NPT female inlets with 2" dia. flanges, polished chrome-plated faucet body, riser & spray valve body, low lead compliant, CSA, ASME, PRSV, NSF

ITEM 40 - WALK-IN COOLER (1 REQ'D)

Kolpak Model -

Cooler with NO floor to be sized as per plan x 8'-6" high.

Panels shall consist of foamed-in-place "tongue and groove" with "Posi-Loc" locking assemblies foamed-in-place at time of fabrication.

Each panel shall be filled with ridge "foamed-in-place" urethane having a thermal conductivity (K-factor) of 0.121 BTU/HR/SQ.FT. per degrees Fahrenheit/inch and an overall coefficient of heat transfer (U factor) of not more than 0.030, "R" factor shall be 33.3. Insulation shall have a 97% closed cell structure, average in-place density of 2.2 lbs. per cubic foot, and a compression strength at yield point of 19 lbs. per square inch. Overall thickness shall be 4". Fire hazard classification according to ASTM E-84 (UL 723) has a flame spread of 25" or less and certified with UL label, box shall have a FM-25 rating.

Provide (2) 48"L.E.D. lights as shown on drawing.

Exterior ceiling shall be galvalume. Interior and exterior wall shall be galvalume steel. Interior ceiling and walls to be white. Front exposed wall and door to be stainless steel #4 finish. Door jamb and door perimeter shall be made of Fiberglass Reinforced Plastic (F.R.P.).

A digital thermometer shall be included with each door section to indicate inside temperature. All walk-ins shall be fabricated to comply with National Sanitation Foundation Standard #7. The NSF label shall be affixed to the interior door pan. Interior corners and floor shall be coved to meet NSF specifications.

Provide enclosure panels from top of walk-in to ceiling of same material as exterior of walk-in. Also, provide enclosure panels between walk-in sides and walls, same material. No common walls with freezer.

Provide the following:

Stainless steel coved base on interior and exterior

Custom threshold to fit to create smooth transition from kitchen to inside of walk-in

Installation Notes: Assemble and set-in-place as per plans.

Verify size and location prior to fabrication.

General Contractor to provide RECESSED PIT for walk-in box.

ALTERNATE MANUFACTURER: American Panel

ITEM 40.1 - WALK-IN COOLER EVAPORATER (1 REQ'D)

Kolpak Model -
WALK-IN COOLER EVAPORATOR

- A. (To be connected to emergency power)
- B. 5/8" indirect line to floor sink
- C. Size to maintain 35 degree F. in box as per plan
- D. Electrical Contractor to interconnect refrigeration system as required.
- E. Plumber Contractor to provide and install drain lines and heat trace from blower coils in box.

ITEM 40.2 - WALK-IN COOLER CONDENSER (1 REQ'D)

Kolpak Model -
WALK-IN COOLER CONDENSER

- A. (To be connected to emergency generator)
- B. Interconnect refrigeration lines with Item
- C. Include Prepiped hermetice compressors with dryers, sigh glasses and head pressure controls. per-wired electrical panel, defost cloc, prssure controls and crankcase heaters. (Verify all requirements with manufacturer)
- D. Verify location of unit.
- E. Provide with mounting skids.
- F. Size to maintain 35 degree F in box as per plan
- G. Electrical Contractor to inconnect refrigeraton system as required.
- H. Plumbing Contractor to provide and install drain lines from blower coils in box
- I. General Contractor to provide wall penetratons from ceiling to blower coils at walk-in

ITEM 41 - WALK-IN FREEZER (1 REQ'D)

Kolpak Model -

Freezer with floor to be sized as per plan x 8'-6" high.

Panels shall consist of foamed-in-place "tongue and groove" with "Posi-Loc" locking assemblies foamed-in-place at time of fabrication.

Provide with floor and reinforced plywood.

Each panel shall be filled with ridge "foamed-in-place" urethane having a thermal conductivity (K-factor_ of 0.121 BTU/HR/SQ.FT. per degrees Fahrenheit/inch and an overall coefficient of heat transfer (U factor) of not more than 0.030, "R" factor shall be 33.3. Insulation shall have a 97% closed cell structure, average in-place density of 2.2 lbs. per cubic foot, and a compression strength at yield point of 19 lbs. per square inch. Overall thickness shall be 4". Fire hazard classification according to ASTM E-84 (UL 723) has a flame spread of 25" or less and certified with UL label, box shall have a FM-25 rating.

Provide (2) 48"L.E.D. lights as shown on drawing.

Exterior ceiling shall be galvalume. Interior and exterior wall shall be galvalume steel. Interior ceiling and walls to be white. Front exposed wall and door to be stainless steel #4 finish. Door jamb and door perimeter shall be made of Fiberglass Reinforced Plastic (F.R.P.).

A digital thermometer shall be included with each door section to indicate inside temperature. All walk-ins shall be fabricated to comply with National Sanitation Foundation Standard #7. The NSF label shall be affixed to the interior door pan. Interior corners and floor shall be coved to meet NSF specifications.

Provide enclosure panels from top of walk-in to ceiling of same material as exterior of walk-in. Also,

provide enclosure panels between walk-in sides and walls of same material.

Provide the following:

Diamond tread aluminum on floor

Stainless steel coved base on interior and exterior

Custom threshold to fit to create smooth transition from kitchen to inside of walk-in

Installation Notes: Assemble and set-in-place as per plans.

Verify size and location prior to fabrication.

General Contractor to provide RECESSED PIT for walk-in box.

ALTERNATE MANUFACTURER: American Panel

ITEM 41.1 - WALK-IN FREEZER EVAPORATER (1 REQ'D)

Kolpak Model -

WALK-IN FREEZER EVAPORATOR

A. (To be connected to emergency power)

B. 5/8" indirect line to floor sink

C. Size to maintain 10 degree F. in box as per plan

D. Electrical Contractor to interconnect refrigeration system as required.

E. Plumber Contractor to provide and install drain lines and heat trace from blower coils in box.

Note: Drain lines MUST be wrapped with heat tape/strips.

ITEM 41.2 - WALK-IN FREEZER CONDENSER (1 REQ'D)

Kolpak Model -

WALK-IN FREEZER CONDENSER-

A. (To be connected to emergency generator)

B. Interconnect refrigeration lines with Item

C. Include Prepiped hermetice compressors with dryers, sigh glasses and head pressure controls. per-wired electrical panel, defost cloc, prssure controls and crankcase heaters. (Verify all requirements with manufacturer)

D. Verify location of unit.

E. Provide with mounting skids.

F. Size to maintain 35 degree F in box as per plan

G. Electrical Contractor to inconnect refrigeraton system as required.

H. Plumbing Contractor to provide and install drain lines from blower coils in box

I. General Contractor to provide wall penetratons from ceiling to blower coils at walk-in

ITEM 42 - FRENCH FRY WARMER (1 REQ'D)

Hatco Model GRFF

Cache County School District

Glo-Ray® Portable Strip Heater, with special stand for food holding pans, with metal sheathed element, NSF, cULus, Made in USA

- 1 ea NOTE: Sale of this product must comply with Hatco's Minimum Resale Price Policy; consult order acknowledgement for details
- 1 ea NOTE: Includes 24/7 parts & service assistance, call 414-671-6350
- 1 ea (domestic voltage)
- 1 ea Model STANDARD Clear Anodized Aluminum housing, finish, standard (available at time of purchase only)

ITEM 43 - SPARE NO. <Spare No.>

ITEM 44 - CASHIER COUNTER (RIGHT SERVING) (2 REQ'D)

Custom Model CASHIER COUNTER

Custom built as size & shape as shown (34" Wide to fit thru 36" door)--to be same general construction as other counters. Provide 1 ea. cash drawer with lock. Provide with soft rubber casters

Utilities:

Installation Notes: Set and Level as per plan.

ITEM 45 - CASHIER COUNTER (LEFT SERVING) (2 REQ'D)

Custom Model CASHIER COUNTER

Custom built as size & shape as shown (34" Wide to fit thru 36" door)--to be same general construction as other counters. Provide 1 ea. cash drawer with lock. Provide with soft rubber casters

Utilities:

Installation Notes: Set and Level as per plan.

ITEM 46 - ONE (1) COMPARTMENT SINK (1 REQ'D)

IMC/Teddy Model DL-2

Utensil/Can Washer, 16 gauge #304 stainless steel construction., one-piece wash basin, 1" OD stainless steel tubing wash supports, fully welded, removable scrap drawer, integrated 12" backsplash, double foot pedal valve, return-mounted faucet, with 48" flexible stainless steel hose & spray head

ITEM 47 - UTILITY DISTRIBUTION SYSTEM - WALL (1 REQ'D)

Captive-Aire Model -

A Utility Distribution System shall provided be as indicated on drawings. Systems shall have two vertical risers, one on each end, with one dedicated to electrical and the other to plumbing. The horizontal distribution raceway between the risers shall be separated into electrical and plumbing compartments and each shall be completely enclosed and water tight with removable access panels. The risers and raceway

shall be constructed of 16 gauge, type 304 stainless steel, #4 finish. A circuit protected dual convenience outlet shall be provided on each riser. Service connections shall be located behind easily removable access panels.

ITEM 48 - MICROWAVE OVEN (1 REQ'D)

ACP Model HDC182

Amana® Commercial Microwave Oven, 0.6 cu. ft. capacity, heavy volume, 4-stage cooking, (11) power levels, (100) memory settings, 60-minute max cooking time, LED display, touch control, interlock safety switch, ADA-compliant Braille touch pads, audible end of cycle signal, side hinged door with tempered glass, sealed ceramic interior shelf, lighted interior, stainless steel exterior & interior, 20 MCA, (total), , cETLus, ETL-Sanitation

ITEM 49 - CONDENSATE HOOD (1 REQ'D)

Captive-Aire

Condensate hood for Dishwasher. Hood shall be of the exhaust only, full canopy type. Hood shall be constructed of 18 gauge, Type 304 stainless steel. Joints and seams shall be continuously welded liquid-tight, and all exposed external welds shall be ground and polished to match the original finish of the metal.

Hood shall include full-length, removable condensate baffles constructed of 18 gauge Type 304 stainless steel. Baffles shall be pitched to drain into a full perimeter, welded, condensate collecting gutter (with one-half inch N.P.T. stainless steel drain fitting). Provide stainless steel matching closure panels from top of hood to finished ceiling. Hood shall be fabricated in accordance with NFPA #96 and shall bear the NSF seal of approval.

Utilities: (see mech. for fan.)

Installation Notes: Mount from ceiling as per plan. Gen. contractor to provide support from structure above as required to mount hood. Interconnect at exhaust duct , collars with exhaust system provided by mech. section

ITEM 50 - EXHAUST HOOD (1 REQ'D)

Captive-Aire Model ND-2-PSP-F

Furnish as shown on plans and in accordance with the following specifications. (District does NOT want Aquamatic)

The model ND-2 is an exhaust only canopy hood rated for all types of cooking equipment. The hood shall have the size, shape and performance specified on drawings and in accordance with the following specifications. Each exhaust hood shall be a high efficiency with stainless steel grease filters, make up air plenum, front discharge via perforated grilles, recognized or listed by UL, ETL and NSF, and built in accordance with the NFPA-96. The hood shall be a minimum 20 gauge, 304 stainless steel with NO. 4 finish on all surfaces. Construction shall be constructed with a double wall front to minimize distortion and other defects. All seams, joints and penetrations of the hood enclosure to the lower outermost perimeter that directs and captures grease-laden vapor and exhaust gases shall have a liquid-tight continuous external weld in accordance with NFPA 96. The hood shall be furnished with U.L. classified high efficiency stainless steel filters. Exhaust duct collar to be 4" high with 1" flange. Duct sizes, CFM and static pressure requirements shall be as shown on drawings. Static pressure requirements shall be precise and accurate; air velocity and volume information shall be accurate within 1-ft increments along the length of the ventilator. Corner hanging angles have a 5/8" x 1-1/2" slot pre-punched at the factory, allowing hanging rods to be used for quick and safe installation. Concealed grease trough with collection cup, to be easily

accessible and removable. Recessed LED light fixtures shall be factory prewired to a single point on hood. Stainless steel matching closure panels from top of hood to finished ceiling, if required, by KEC.

Utilities: for lights

Installation Notes: Mount from ceiling as per plan 6'-8" above floor. Gen. contractor to provide support from

structure above as required to mount hood. Interconnect at exhaust duct, collars with exhaust system, provided by mech. section.

ITEM 51 - EXHAUST HOOD (1 REQ'D)

Captive-Aire Model ND-2-PSP-F

Furnish as shown on plans and in accordance with the following specifications. (District does NOT want Aqua-Matic)

The model ND-2 is an exhaust only canopy hood rated for all types of cooking equipment. The hood shall have the size, shape and performance specified on drawings and in accordance with the following specifications. Each exhaust hood shall be a high efficiency with stainless steel grease filters, make up air plenum, front discharge via perforated grilles, recognized or listed by UL, ETL and NSF, and built in accordance with the NFPA-96. The hood shall be a minimum 20 gauge, 304 stainless steel with NO. 4 finish on all surfaces. Construction shall be constructed with a double wall front to minimize distortion and other defects. All seams, joints and penetrations of the hood enclosure to the lower outermost perimeter that directs and captures grease-laden vapor and exhaust gases shall have a liquid-tight continuous external weld in accordance with NFPA 96. The hood shall be furnished with U.L. classified high efficiency stainless steel filters. Exhaust duct collar to be 4" high with 1" flange. Duct sizes, CFM and static pressure requirements shall be as shown on drawings. Static pressure requirements shall be precise and accurate; air velocity and volume information shall be accurate within 1-ft increments along the length of the ventilator. Corner hanging angles have a 5/8" x 1-1/2" slot pre-punched at the factory, allowing hanging rods to be used for quick and safe installation. Concealed grease trough with collection cup, to be easily accessible and removable. Recessed LED light fixtures shall be factory prewired to a single point on hood. Stainless steel matching closure panels from top of hood to finished ceiling, if required, by KEC.

Utilities: for lights

Installation Notes: Mount from ceiling as per plan 6'-8" above floor. Gen. contractor to provide support from

structure above as required to mount hood. Interconnect at exhaust duct, collars with exhaust system, provided by mech. section.

ITEM 51.1 - FIRE SUPPRESSION SYSTEM (1 REQ'D)

Ansul Fire Protection Model R102

Model # R102 as manufactured by Ansul.

Utilities: Electrician to provide shunt trip switch to shut off electrical equip. under hood when system trips.

K.E.C. to provide mechanical gas valve installed by plumber to shut off gas equip. under hood when

system trips.

ITEM 52 - MOBILE HEATED CABINET (1 REQ'D)

Cres Cor Model H137UA12D

Cabinet, Mobile Heated, insulated, top-mount heater assembly, recessed push/pull handles, (12) sets of chrome plated wire universal angle slides on 4-1/2" centers adjustable 1-1/2" centers, solid state electronic control, LED digital display, field reversible dutch doors, (4) heavy duty 5" swivel casters (2) braked, anti-microbial latches, aluminum exterior & interior, NSF, cCSAus

1 ea 10 ft power cord, , standard

1 ea Right-hand door swing (top & bottom doors), standard

ITEM 53 - REFRIGERATED MERCHANDISER (1 REQ'D)

True Manufacturing Co., Inc. Model GDM-43-HC~TSL01

Refrigerated Merchandiser, two-section, True standard look version 01, (8) shelves, (2) Low-E thermal glass hinged doors, bottom mounted self-contained refrigeration, powder coated steel exterior, white interior with stainless steel floor, frame rail fitted with leg levelers, R290 Hydrocarbon refrigerant, 1/2 HP, , cULus, UL EPH Classified, Made in USA, ENERGY STAR®

1 ea NOTE: Commonly stocked model in black exterior, & white exterior; verify availability with factory

1 ea Self-contained refrigeration standard

1 ea Exterior: Black powder coated steel, standard

1 ea Interior: White aluminum, with white shelving, standard

1 ea Left door hinged left, right door hinged right standard

1 ea Illuminated sign decal: S-TS-02 "TRUE Stripe" graphic, standard

ITEM 54 - SHELVING, WALK-IN (2 It REQ'D)

Metro Model -

Shelving, walk-in

8 ea Model A2448NK3 Quick Ship - Super Adjustable Super Erecta® Shelf, wire, 48"W x 24"D, Metroseal 3 (corrosion-resistant) finish, corner release system, with Microban® antimicrobial protection, NSF

8 ea Model 63PK3 Quick Ship - Super Erecta® SiteSelect™ Post, 62-7/16"H, adjustable leveling bolt, posts are grooved at 1" increments & numbered at 2" increments, double grooved every 8", Metroseal 3 Green epoxy coated corrosion-resistant finish with Microban® antimicrobial protection

**SECTION 11 5013
VOCATIONAL SHOP EQUIPMENT**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Wood shop equipment - Owner Provided / Contractor Installed.
- B. Metal shop equipment - Owner Provided / Contractor Installed.
- C. Electric kiln - Owner Provided / Contractor Installed.

1.02 RELATED REQUIREMENTS

- A. Section 22 1005 - Plumbing Piping: Plumbing connections for appliances.
- B. Section 26 0583 - Wiring Connections: Electrical connections for appliances.

PART 2 PRODUCTS

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify utility rough-ins are provided 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 equipment to provide efficient operation.

3.04 CLEANING

- A. Remove packing materials from equipment and properly discard.
- B. Wash and clean equipment.

END OF SECTION 11 5013 11 5013

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**SECTION 11 5300
LABORATORY EQUIPMENT**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. CMGC Contractor -furnished laboratory equipment including CFOI equipment installed by Owner.
- B. Installation of CMGC Contractor -furnished (CFCI) equipment.

1.02 ABBREVIATIONS AND ACRONYMS

- A. CFCI - Contractor Furnishes and Contractor Installs.

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. SMACNA (SRM) - Seismic Restraint Manual Guidelines for Mechanical Systems; 2008.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Preinstallation Meeting: Convene one week before starting work of this section.
- B. Sequencing: Ensure that utility connections are achieved in an orderly and expeditious manner.

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, clearances, and locations; required accessories and optional features; point loads and _____.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Package each piece of equipment to ensure protection from damage during shipment and delivery. Legibly indicate on the exterior of each container or crate, the shipping address and a brief description of its contents. Outside of the container, fasten a waterproof envelope containing a packing list and complete instructions for uncrating and setting the equipment in place.
- B. Protect finished surfaces during handling and installation with protective covering of polyethylene film or another suitable material.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Goggle UV Sanitizer Cabinets:
 - 1. Flinn Scientific; SE1000, <https://www.flinnsci.com>
 - 2. EISCO; GGSN10, <https://www.eiscolabs.com/>
 - 3. Substitutions: See Section 01 6000 - Product Requirements
- B. Chemical Storage Cabinets:
 - 1. ASECOS, CS-Classic CS.195.105, https://www.asecos.com/EN_index_1000.html
 - 2. Substitutions: See Section 01 6000 - Product Requirements

2.02 EQUIPMENT

- A. CMGC Contractor furnishes and installs equipment noted as CFCI.
- B. Prewire and prepipe each unit of equipment complete with trim and fittings. Include reduced pressure or atmospheric type backflow preventer fitting to prevent backflow of polluted water or waste into water supply system or equipment. Comply with applicable code requirements.
- C. Installation Accessories: Provide all rough-in frames, anchors, supports, accessories and closure trim required for complete installation.

- D. Use corrosion-resistant materials for all rivets, bolts, nuts, studs, spacers, and welding metal.
- E. Fully assemble equipment in factory, except for those items which cannot be moved to their final locations as single item due to new construction space restrictions.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that utility connections, rough-in frames, anchors and supports are accurately placed and deliver building services at specified characteristics and/or within acceptable functional ranges.
- B. Examine areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of equipment.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION

3.03 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Mounting: Anchor equipment securely in place.
 - 1. Mount equipment in compliance with SMACNA (SRM) requirements.
- C. Touch-up minor damaged surfaces caused during installation. Replace damaged components as directed by Architect.

3.04 CLOSEOUT ACTIVITIES

- A. See Section 01 7800 - Closeout Submittals, for closeout submittals.
- B. Final Acceptance: Remove labels, fingerprints, and clean all surfaces both inside and out. Repair any marred or damaged surfaces that affect appearance, such as both interior and exterior of cabinets in a manner acceptable to Owner. Replace any parts that cannot be repaired in such a manner.

END OF SECTION 11 5300

SECTION 115561
THEATRICAL LIGHTING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 GOVERNING CLAUSE

- A. For the sake of brevity these specifications shall omit phrases such as "Contractor shall furnish and install", "unless otherwise indicated or specified", etc., but these phrases are nevertheless implied. Mention of materials and operations requires the Contractor to furnish and install such materials and perform such operations completely to the satisfaction of the Owner.

1.3 SCOPE OF WORK

- A. One company shall be responsible for the installation of all aspects of the stage equipment in the Auditorium, Little theater, and Green Screen room. Work under this section and related sections shall include the furnishing of all labor, materials, tools, transportation services, supervision, etc., necessary to complete installation of new stage equipment as well as any other items as herein listed, all as described in these specifications and related sections, as illustrated on the accompanying drawings; or as directed by the Architect or his Representative. Work includes the following:
 - 1. Stage Lighting, Dimming & Control System: Specified herein.
 - a. Theatrical lighting is shown in the electrical plans. See electrical plans for more information.
 - 2. Motorized Rigging: Specified in 116133 – Rigging Systems
 - 3. Other rigging systems: Specified in 116133 – Rigging Systems
 - 4. Stage Curtains & Tracks: Specified in 116133 – Rigging Systems

1.4 RELATED SECTIONS:

- A. 116133 – RIGGING SYSTEMS

1.5 SUBSTITUTIONS:

- A. Specific items of equipment are specified by trade names. It has been determined by the Owner that these are the items desired by the owner and established a standard of quality, equipment function and/or process. It is not the purpose nor intent of these documents to eliminate competitive bids. To allow proper and fair comparison of pricing, contractors are required to submit their base bid price on the specified equipment. A contractor may submit an alternate bid based on equipment different from that specified only if that Contractor has received prior approval in writing from the Owner or Engineer at least 10 days prior to bid. Accompanying each request shall be a letter specifically detailing each substitution including catalog data, specifications, swatches, operative samples, technical information, drawings, performance and test data, and complete descriptive and functional information to assist in a fair evaluation. Failure to submit any substitution for prior approval or not providing sufficient data for evaluation shall require the exact item specified to be furnished. Owner's approval of a substitution for bid purposes will not relieve the contractor from the responsibility of meeting all specification criteria. If an approval of a substitution is granted, the Contractor shall be fully responsible for all changes (wiring, power, distribution, support structure, etc.) such substitution shall require.

1.6 DEFECTIVE OR NON-APPROVED MATERIALS

- A. Should any stage equipment be found defective, not meeting specifications, or that which has not been approved in writing by the Owner shall, upon discovery (including any time within the period of the guarantee), be replaced with the specified equipment or material at no additional cost.

1.7 PRE-APPROVED STAGE EQUIPMENT CONTRACTORS

- A. One company shall be responsible for the installation of all aspects of the stage equipment as specified in this section. This shall include but not be limited to all rigging, curtains, tracks, motors and control, stage lighting fixtures, stage/house dimming, and dimming controls and miscellaneous equipment. The following companies have prior approval as STAGE EQUIPMENT CONTRACTORS:

- 1. Barbizon Light of the Rockies - Utah
 - a. Braden Howard
 - b. 97 South Main St #243, Perry UT, 84302
 - c. bhoward@barbizon.com
 - d. 801-871-5483
- 2. Oasis Stagewerks
 - a. Tim Hansen
 - b. 249 S Rio Grande St, Salt Lake City, UT, 84101
 - c. main@oasis-stage.com
 - d. 801-363-0364

3. Upstage
 - a. Richard Sidal
 - b. 1435 S 4800 W #300, Salt Lake City UT 84104
 - c. richard@upstage-rentals.com
 - d. 801-779-3030

4. Performance Audio
 - a. 2456 S. West Temple
 - b. Salt Lake City, UT 84115
 - c. (800)771-8330

- B. To be considered as a Stage Equipment Contractor on this project, each Contractor requesting approval must submit to the Architect at least ten (10) days prior to the date of bid opening a letter expressing his intent to bid. This letter shall include a list of at least five (5) projects of similar size and scope completed by this firm within the last five (5) years. If motorized line-shaft rigging is required on this project, the letter shall indicate the number of line-shaft set provided and installed and the manufacturer of the equipment on each of the five projects. Inspection of one completed installation may be requested by the Architect/Architect's Representative prior to consideration of request to bid. The stage equipment contractor shall have been in business under the same name for five (5) full years preceding the date of this bid doing work similar to the type specified. The decision of the Architect as to the capability of the Bidder to successfully complete and maintain the system, based on this pre-qualification information shall be final.

- C. Pre-Bid request letter shall include a statement that all major items of equipment shall be bid and supplied as specified or shall contain details of all proposed substitute equipment for review by the Architect/Architect's Representative. Substitute equipment items to include specifications, parts numbers, and details of interconnection to proposed system. The decision of the Architect/Architect's Consultant as to the acceptability of substitute equipment shall be final.

- D. The Stage Equipment Contractor shall employ only fully trained stage riggers and mechanics, assisted by common laborers, 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 Stage Equipment Contractor and all directions given by him shall be as binding as if given by the Stage Equipment Contractor.

1.8 THEATRICAL LIGHTING SUMMARY

- A. Section Includes:
 1. Relay Panels
 2. Control console and control devices.
 3. Luminaires and accessories.
 4. Distribution components.

1.9 DEFINITIONS

- A. Fade Time: The time it takes all zones to fade from one lighting scene to another, with all zones arriving at the next scene at the same time.
- B. Control Voltage: As defined in NFPA 70, term for circuits and equipment operating at less than 50 V or for remote-control, signaling, and power-limited circuits.
- C. Scene: The lighting effect created by adjusting several zones of lighting to the desired intensity.
- D. Channel: An individual control output on a control console, accessed and regulated by a slider, switch, or button; or in some cases, accessed by a discretely assigned address and regulated by a data input apparatus.

1.10 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: For theatrical lighting.
 - 1. Include plans, elevations, sections, mounting, and attachment details.
 - 2. Detail fabrication and installation for dimmer racks and arrangements, characteristics, and circuit assignments of various modules and rack-mounted accessories.
 - 3. Elevation views of front, rear, and side panels indicating devices and controls, including illustrations and dimensioned outline drawings.
 - 4. Include diagrams for power, signal, and control wiring. Show connections, circuits, and channel assignments.
 - 5. Equipment legend showing a unified system of designations for lighting instruments, panels, dimmers, circuits, and equipment.

1.11 INFORMATIONAL SUBMITTALS

- A. Coordination Drawings: Floor plans, reflected ceiling plan(s), and other details drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved:
 - 1. Required working clearances for operation, maintenance, and environmental conditions.
 - 2. Areas above and around dimming equipment where piping and ducts are prohibited.
 - 3. Rack layout and relationships between components and adjacent structural and mechanical elements.
- B. Qualification Data: For Installer.
- C. Seismic Qualification Certificates: For lighting equipment and distribution equipment from manufacturer.
 - 1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.

2. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions.
3. Detailed description of equipment anchorage devices on which the certification is based and their installation requirements.

D. Field quality-control reports.

1.12 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For luminaires, distribution components, software operating manuals, and controls to include in emergency, operation, and maintenance manuals.

1. In addition to items specified in Section 017823 "Operation and Maintenance Data," include the following:
 - a. Instructional DVD: Professionally produced informational presentation to provide comprehensive instructions for equipment installation, connectivity, programming, and functional use. Information provided shall be specific to equipment provided for Project and shall include ancillary equipment and its integration into the theatrical lighting control system.
2. In addition to items specified in Section 017823 "Operation and Maintenance Data," include the following:
 - a. Control-Console Introduction:
 - 1) Descriptions of controls and features.
 - 2) Software instruction manuals.
 - 3) Setup requirements for unit and related equipment.
 - 4) Default settings.
 - 5) Maintenance procedures and schedules.
 - b. Control-Console Operation:
 - 1) Elementary on-off operation.
 - 2) How to set cues manually.
 - 3) How to patch dimmer to channels electronically.
 - 4) How to operate presets manually.
 - 5) How to operate fundamental memory.
 - 6) How to set and record simple cues.
 - 7) How to recall, play back, and revise cues and scenes.
 - 8) How to use submasters, groups, focus points, fader channels; and how to split cues, store and recall programs, set up special effects, and print out cues.
 - 9) How to set up and run system for a typical event or performance.
 - 10) How to get help.
 - c. Relay Panels:

- 1) Descriptions of features, functions, and safety and security precautions.
- 2) Descriptions of relay module features, software-driven functions, non-dim functions, and associated systems.
- 3) How to terminate basic power-in and power-out connections.
- 4) Basic maintenance requirements, including need for qualified electrician for internal maintenance; basic maintenance schedule; techniques for keeping terminals properly tightened, and techniques for performing other required servicing.
- 5) How to get help.
- 6) Description of warranty.

d. System Troubleshooting: Procedures for handling problems with common software, programming, control console, and distribution system; include information on how to get help.

B. Software and Firmware Operational Documentation:

1. Software operating and upgrade manuals.
2. Program Software Backup: On USB drive or compact disk, complete with data files.
3. Device address list if applicable.
4. Printout of software application and graphic screens.

1.13 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Relay Modules: One of each type and rating installed.
2. Fuses: Three of each kind.

1.14 QUALITY ASSURANCE

A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.

1.15 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace components of the complete dimming control system and luminaires that fail in materials or workmanship within specified warranty period.

1. Warranty Period: Cost to repair or replace parts for two years from date of Substantial Completion.
2. Extended Warranty Period: Cost of replacement parts (materials only, f.o.b. the nearest shipping point to Project site), for eight years.
3. Theatrical Lighting fixtures shall have a 5-year fixture and 10-year LED warranty.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers / Installers: Subject to compliance with requirements, provide products by one of the following and as indicated on the Drawings and in Related Sections:
1. The equipment herein specified shall be manufactured by Strand Lighting
 2. Permission to bid does not imply acceptance of the manufacturer. It is the sole responsibility of the electrical contractor to ensure that any price quotations received and submittals made are for controls systems that meet or exceed the specifications.

2.2 ARCHITECTURAL CONTROL PROCESSOR MODULES

- A. Control Processor Modules
1. The Architectural Control Processor shall be the Unison Paradigm P-ACP Series Control Processor as manufactured by Electronic Theatre Controls, Inc., or equal.
 2. The Architectural Control Processor (ACP) assembly shall be designed for use in DRd Series Dimming Enclosures and ERn Series Control Enclosures.
 3. The processor shall utilize microprocessor based, solid state technology to provide multi-scene lighting and building control.
 - a. ACP shall support functions such as station programming, macro sequencing, electronic lockout, room combine and astronomical time clock events. ACP station processor shall allow configuration of the control system via the menus. See software section for additional system details.
 - b. When used in a dimming enclosure, the ACP shall allow access to dimming control menus including the status screen, dimming configuration screen, backup menu, test menu and configuration menu.
 4. One ACP shall be rated to drive 1024 channels of control, 1024 zones, 64 rooms, 512 presets, 63 button or button/fader stations and 6 Touchscreen Stations
 5. ACP module electronics shall be convection cooled.
 6. The ACP shall provide front-panel RJ45 jack, Secure Digital (SD) card slot, and Universal Serial Bus (USB) Port for configuration and data exchange.
 7. Architectural Lighting System configuration and program information shall be stored in flash memory, which does not require battery backup.
 8. The ACP shall be contained in a plug-in assembly and require no discrete wiring connections; all wiring shall be terminated into Dimming or Control Enclosure.
 - a. The ACP shall support the following communications:
 - 1) Echelon LinkPower

- 2) 10/100BaseTX, auto MDI/MDIX, 802.3af compliant Ethernet networking with TCP/IP, ESTA BSR E1.17 Advanced Control Networks (ACN) and ESTA BSR E1.31 (sACN) Protocols
- 3) EIA-232 serial protocol
- 4) ESTA DMX512A, configurable as input or output ports
- 5) Dry contact closure inputs
- 6) Dry contact closure outputs, rated at 1A@30VDC

2.3 ARCHITECTURAL CONTROL STATION POWER MODULES

A. Station Power Modules

1. The Station Power Module shall be the Unison Paradigm P-SPM-E Series Station Power Module as manufactured by Electronic Theatre Controls, Inc., or equal.
 - a. The Station Power Module (SPM) assembly shall be designed for use in DRD Series or ERn Rack Enclosures.
2. The SPM shall convert input power into low-voltage (Class II) power with data line and a secondary auxiliary low-voltage line to energize button, button/fader, touchscreen, and interface devices for multi-scene lighting and building control.
3. The SPM, in conjunction with a matching Architectural Control Processor (ACP), shall support Echelon LinkPower communications with remote devices, including button, button/fader, touchscreen and interface stations, and shall interoperate with LonMARK-approved third-party devices.
 - a. The LinkPower network shall utilize polarity-independent, low-voltage Class II twisted pair wiring, type Belden 8471 (unshielded) or Belden 8719 (shielded) or equivalent. One # 14 AWG drain wire will be required for system not using grounded metal conduit.
 - b. The LinkPower network shall be topology free. Network wiring may be bus, loop, home run, star or any combination of these.
 - c. Link power wiring shall permit a total wire run of 1640 ft. (500m)
 - d. Link power wiring between stations shall not exceed 1313 ft. (400m).
 - e. The SPM shall support auxiliary power for certain remote devices, including touchscreen and interface stations, as required by the device.
 - 1) The auxiliary power network shall utilize polarity-dependent, low-voltage Class II wiring, consisting of two # 16 AWG wires.
 - 2) Auxiliary wiring shall permit a total wire run of 1640 ft. (500m)
 - 3) The SPM shall supply 1.25 amps at 24v DC continuously.
4. ACP module electronics shall be convection cooled.
5. Each P-ACP shall support up to (5) NSPS and (1) SPM per processor
 - a. Each P-ACP shall support up to (128) stations and sensors across these power supplies
6. Each SPM shall

- a. Supply power for up to 63 button and button/fader stations.
- b. Supply auxiliary power for a similar number of interface stations.
- c. Shall supply auxiliary power for up to four Touchscreen stations, when a like number of other stations are deducted from the total.
 - 1) Repeaters and dual-repeaters allow two additional Touchscreens (six total) when a like number of other stations are deducted from the total

2.4 TOUCHSCREEN CONTROL STATIONS

- A. The Touchscreen Control Stations shall be the Unison Paradigm Touchscreen P-TS7 Series Control Stations as manufactured by ETC, Inc., or equal.
- B. General
 1. Touchscreen stations shall support default and fully graphical control pages.
 2. The Touchscreen station shall operate using graphic buttons, faders and other images on at least 30 separate programmable control pages.
 3. Touchscreen stations shall also allow programming of page pass-code, lock out and visibility levels.
- C. Mechanical
 1. Touchscreen stations shall consist of a seven inch, backlit liquid crystal display (LCD) with a minimum resolution of 800 by 400 pixels and 24-bit color depth with a capacitive touch interface.
 2. Touchscreen bezels shall be constructed of cast aluminum finished in a fine texture powder coat.
 - a. Touchscreen shall be available in five standard colors
 - 1) Cream (RAL 9001)
 - 2) Ivory (RAL 1015)
 - 3) Gray (RAL 7001)
 - 4) Black (RAL 9004)
 - 5) Signal White (RAL 9003)
 - b. The bezel shall have no visible means of attachment.
 - c. The bezel shall allow the touchscreen to be installed and removed without the use of tools
 - d. The bezel shall provide two working positions for the Touchscreen: service and normal operation.
 3. Touchscreen shall offer optional hinged locking covers
 - a. Locking covers shall be made from cast aluminum and be painted to match standard touchscreen color options

- b. Locking covers shall allow for viewing of system status on the touchscreen through a smoked Lexan window
- 4. The manufacturer shall provide back boxes for all LCD stations.
 - a. Flush back box for Touchscreens with or without locking covers shall be 7.94" wide x 5.33" high x 3.25" deep
 - b. Surface back box dimensions shall be 8.3" wide x 5.6" high x 2.75" deep
 - c. Surface back box for Touchscreens with locking cover dimensions shall be 10.0" wide x 6.7" high x 2.75" deep

D. Electrical

- 1. Touchscreens shall be powered entirely by the System network.
- 2. Touchscreens shall connect to the System using an Ethernet network with Power over Ethernet (PoE) or the Unison control station Echelon® Link power network.
 - a. Ethernet Network
 - 1) Ethernet network shall be 10/100BaseTX, auto MDI/MDIX, 802.3af (PoE) compliant.
 - 2) Network shall utilize Unshielded Twisted Pair (UTP) Category 5, or better wiring.
 - 3) PoE power consumption shall be PoE class 2, consuming no more than 6 watts.
 - b. Echelon® Link power network.
- 3. Link power shall utilize low-voltage Class II unshielded twisted pair, type Belden 8471 or equivalent, and one #14 ESD drain wire (when not installed in grounded metal conduit).
 - 1) Touchscreen stations shall also require (2) #16 AWG stranded wires for 24Vdc operating power. 24Vdc wiring shall be topology free.
 - 2) Network wiring may be bus, loop, home run, star or any combination of these.
 - 3) Network insulation displacement connectors shall be provided with all stations.

E. Functional

- 1. System
 - a. The Touchscreen shall support configuration firmware upload from a Paradigm Processor as proxy
 - b. The Touchscreen shall support configuration or firmware upload from local removable media
- 2. Setup Mode
 - a. There shall be a setup display that is separate from any user-defined configuration

- b. It shall be possible to view and modify connectivity settings
 - c. It shall be possible to view status information
 - d. It shall be possible to view and modify LCD screen settings
 - e. It shall be possible to perform Touchscreen calibration
 - f. It shall be possible to view and modify audio settings
 - g. The appearance of the setup display shall be standard and not editable
 - h. The setup display may be invoked from within the user-defined configuration and/or physical button on the Touchscreen
 - i. There shall be a default protected method to invoke the setup display
3. Configurations
- a. It shall be possible to have multiple configurations stored within an LCD Station
 - b. Where multiple configurations are stored there shall be a boot menu to allow selection of a configuration
4. Operation
- a. The Unison Paradigm Control System shall be designed to allow control of lighting and associated systems via Touchscreen controls. System shall allow the control of presets, sequences, macros and time clock events.
 - 1) System presets shall be programmable via Button, Button/Fader, Touchscreen, or LightDesigner software.
 - a) Presets shall have a discrete fade time, programmable from zero to 84,600 seconds with a resolution of one hundred milliseconds.
 - b) Presets shall be selectable via Touchscreen stations.
 - 2) System macros and sequences shall be programmable via LightDesigner system software.
 - a) Macro and sequence steps shall provide user selectable steps, and allow the application of conditional logic.
 - b) Macro and sequences shall be activated by button, time clock event or LightDesigner software.
 - 3) System time clock events shall be programmable via the Touchscreen, LightDesigner system software, the processor user interface, or the internal web server.
 - a) Time clock events shall be assigned to system day types. Standard day types include: anyway, weekday, weekend, Sunday, Monday, Tuesday, Wednesday, Thursday, Friday and Saturday. System shall support programming of additional custom or special day types.
 - b) Time clock events shall be activated based on sunrise, sunset, time of day or periodic event. System shall automatically compensate for regions using a fully configurable daylight saving time.

- 4) A Color picker, supporting Hue, Saturation and Brightness (HSB) color selection shall be available for color selection of color changing fixtures and provide visual feedback of the current color produced by the associated fixture.
 - a) The color picker shall be provided with a default layout that requires no user configuration
 - b) The Color Picker shall provide RGB faders in addition to the default HSB color wheel for color selection
 - c) Color picker values shall allow for numerical value input in addition to color wheel and fader control
 - d) The color picker shall be compatible with color mixing systems that use up to seven discrete color control channels
- b. Touchscreen stations shall be designed to operate standard default or custom system functions. Components shall operate default functions unless re-assigned via LightDesigner, the Windows-based configuration program.
 - 1) Optional button functions include: preset selection, manual mode activation, record mode activation, station lockout, raise, lower, macro activation, and cue light, or room join/separate.
 - 2) Optional fader functions include master control, individual channel control, fade rate control or preset master control.
- c. Touchscreen stations shall allow programming of station and component electronic lockout levels via LightDesigner.
- d. It shall be possible to adjust LCD contrast and brightness.
- e. It shall be possible to program the station to dim during periods of inactivity.

2.5 DIGITAL BUTTON AND FADER STATIONS

A. Button and Fader Stations

1. General

- a. The control station shall be the Paradigm Inspire Station Series as manufactured by ETC, Inc., or equal
- b. It shall be a remote station on a LinkConnect network that can recall presets, provide direct zone control, play macros, and provide room combine actions for a control system
- c. The station shall consist of a dual function (control/ record) push-button with an integral tri-color backlight for each corresponding button and fader

2. Mechanical

- a. Control stations shall operate using one, two, four, six or eight buttons. A four button with fader station shall also be available

- b. All button stations shall be available with cream, grey, black, or white decorator style faceplates
 - 1) Manufacturer's standard colors shall conform to the RAL CLASSIC Standard
 - c. Stations shall have tri-color backlights for each button and fader
 - 1) Indicators shall utilize a configurable color backlight for active status
 - 2) Indicators shall utilize a configurable color backlight for inactive status to assist in locating stations in dark environments. Stations that do not support a lit inactive or deactivated state shall not be accepted
 - 3) Stations shall support an off-backlight state of inactive status when required
 - d. All faceplates shall be designed for flush or surface mounting and have no visible means of attachment
 - e. Station faceplates shall be constructed of ABS plastic and designed based on a standard decorator style faceplate.
 - f. Buttons shall be indelibly laser marked for each button function
 - g. Control station electronics shall mount directly behind the faceplate. The entire assembly shall mount into a single gang back box. Back boxes for flush mounted stations shall be industry standard back boxes. The manufacturer shall supply back boxes for surface mounted stations.
3. Electrical
- a. Control station wiring shall be LinkConnect control wiring utilizing low-voltage, Class II unshielded twisted pair, type Belden 8471 or equivalent, and one #14 ESD drain wire (when not installed in grounded metal conduit).
 - b. The station shall operate on class 2 voltage provided by the control system via the LinkConnect network.
 - c. Station wiring must be topology free. It may be point-to-point, bus, loop, home run or any combination of these.
 - d. Wiring termination connectors shall be provided with all stations.
 - e. Control stations shall be UL/ cUL listed and CE marked and meet WEEE Compliance
4. Functional
- a. The Control System shall be designed to allow control of lighting and associated systems via Button and Fader controls.
 - 1) System presets shall be programmable via LightDesigner configuration software.
 - a) Presets shall have a discrete fade time, programmable from zero to 1,000 hours with a resolution of one millisecond.
 - 2) System macros and sequences shall be programmable via LightDesigner configuration software.

- a) Macro and sequence steps shall provide user selectable steps and allow the application of conditional logic.
 - b) Macro and sequences shall be activated by button, time clock event or LightDesigner software.
- b. Control components shall be designed to operate default or custom system functions. Components shall operate default functions unless re-assigned via LightDesigner, the software-based configuration program.
- 1) Optional button functions include: preset selection, manual mode activation, record mode activation, station lockout, raise, lower, macro activation, or room join/separate.
 - 2) Optional fader functions include manual master control, individual zone control, color control fade rate control or preset master control.

2.6 LIGHTING CONSOLE AND ACCESSORIES

A. General

1. The lighting control console shall be a microprocessor-based system specifically designed to provide complete control of stage, studio, and entertainment lighting systems. The console shall be the Ion Xe as manufactured by Electronic Theatre Controls, Inc., or equal from Chauvet or Strand.
2. The system shall provide control of either 2,048 or 12,288 outputs on a maximum of 32,768 control channels, which may be any number from 1 to 99,999. Systems that require external co-processing to control 12,288 outputs shall not be acceptable. Output shall be distributed over a 10/100 MB Ethernet network using Net3/ACN, ETCNet2, Avab and/or Artnet (multi-cast) protocols. The user shall be able to control the application of protocols at an individual address level.
3. The system shall support full bi-directional RDM communication with compatible devices via Net3 DMX/RDM Gateways. RDM communication shall adhere to ANSI standard E1.20-2006 Entertainment Technology – RDM – Remote Device Management Over DMX512 Networks. Supported RDM features shall include:
 - a. Discovery and Identification of RDM capable devices
 - b. Setting of start addresses, operating modes and additional settings as exposed by connected devices and controllable via RDM
 - c. Viewing of Sensor data as provided by connected devices
 - d. Error reporting as provided by connected device
4. A maximum of 10,000 cues, 1000 groups, 1000 presets, 4 x 1000 palettes (Intensity, Focus, Color and Beam), 99,999 macros, 1000 effects, 1000 curves, 1000 Color Paths and 1000 snapshots may be contained in non-volatile electronic memory and stored to an onboard solid-state hard drive or to any USB storage device.
5. Recorded cue lists may be played back simultaneously on a maximum of 200 faders. Channels shall respond to cue information by last instruction with discrete rate control provided for all cues. The console may be placed in Tracking or Cue Only mode by the

user as a system default and overridden on individual record actions as required. HTP/LTP intensity flags, assert, proportional, intensity master or manual master fade control. Priority and Background Priority may be placed on each cue list. It shall also be possible for a cue list to contribute to playback background states or to withhold such contributions.

6. A Master Playback fader pair shall be provided. The fader pair may execute crossfades or all-fades, with IFCB cue level timing,
7. Fader wings (standard or motorized) provide additional playback faders (up to 200), additive or inhibitive submasters (up to 999), and grand master control. Presets and IFCB palettes may be loaded to faders for playback control, either individually or in user-defined lists. Virtual fader control is also provided.
8. A high-resolution level wheel shall be provided to control intensity for selected channels and scrolling within selected displays. Four pageable encoders shall be provided for control of non-intensity parameters. Non-intensity encoders toggle between coarse and fine control. The expand function for frame table devices shall provide a graphic representation of all images and colors in the associated device for instant selection. A graphic shutter representation shall provide additional control of shutter parameters. The display shall also provide an indication of the current value for the associated parameter, based on channel selection. A high-resolution rate wheel, which may also be used for fader paging shall be provided.
9. Control surface buttons shall be backlit. This backlighting provides indication of functional states. Backlight intensity shall be user controllable and shall automatically dim after a defined period of inactivity.
10. Control and programming features for automated fixtures shall also include: a standard library of fixture profiles, the ability to copy and edit existing profiles and create new profiles, patch displays including channel and output addressing, 16-bit fade resolution, color characterization allowing color in up to six different color spaces.
11. System information, including playback status, live output and blind values for all record targets shall be displayed on a maximum of two external high-resolution monitors, which may also be multi-touch touch-screens. Every display shall support three user-definable workspaces. Each of these workspaces shall provide individually configured frames, with size/scaling controls. Any Windows 7 compatible display may be used.
12. 12. A context sensitive on-line Help feature shall explain and provide an example of the operation of each feature of the system. This help system shall be integrated into the on-board user manual via hyperlinks.
13. 13. A fully integrated Virtual Media Server feature shall allow user to map images and animations to a rig array. 40 such maps may be created, each with 12 layers. System that rely on external hardware or software for this functionality shall not be acceptable.
14. User-definable, interactive displays may be created. These displays, which can be used in live and blind operating modes, allow graphical layout of channels, desk buttons and programming tools. Standard symbols are provided, and the user may import their own symbols or graphics. Each symbol may be individually defined with data feedback characteristics. Non-interactive status information, such as a mirror of other user' s command lines, may also be included in the display. A graphical browser is provided for fast selection of these views. Multiple zoom factors and placements may be stored and recalled for each display.
15. A detachable alphanumeric keyboard shall be provided. The keyboard shall allow labeling of all show content. An integrated virtual alphanumeric keyboard shall also be provided.

16. Console software upgrades shall be made by the user via flash drive. It shall be possible to install software updates in all consoles, processor units and remotes from one device over the network.
17. The console operating software shall be loaded into program execution memory from the internal hard drive when the console is powered. In the event of an uncontrolled shutdown, the console shall return to its last output state when power is restored. Devices requiring a UPS to provide such protections shall not be acceptable.
18. Integrated dimmer monitoring features shall be provided to allow indication of dimming system status, error states and dimmer load monitoring. Adjustment of dimmer configuration from the console shall also be supported. Communications with the dimming system shall utilize ANSI E1.17 2006 - Entertainment Technology - Architecture for Control Networks.
19. 19. Integrated RDM device features shall be provided. The console shall discover and patch RDM devices. The console shall monitor RDM devices to allow indication of RDM device online/offline status error states. The console shall be capable of changing settings of RDM devices such as the DMX start address. Communications with the RDM devices shall utilize ANSI E1.20 2006 – Remote Device Management.
20. Network configuration tools shall be provided from within the desk.
21. Show data may be created and modified on a personal computer, using either Windows 7 or higher or a Macintosh platform running OS 10.11 or later via a free offline editing application. The program shall run natively on Apple operating systems. Applications requiring PC emulation programs shall not be acceptable.
22. A PC, using either Windows 7 (or higher), or a Macintosh running OS 10.11 (or later) using the offline software application shall be able to connect to a control system via the network and view or modify current show data in an independent display environment, using an ETCnomad key. When connected without the key, the computer shall operate in Mirror Mode, with the device to be mirrored selectable by the user.
23. Synchronized backup shall be provided via another full console on the network, an ETCnomad/Puck, or by use of a remote processor unit. The backup console/RPU shall maintain synchronized playback with the master and shall take over control of the lighting system upon loss of communication with the master. Use of two RPUs to service and backup system output is also supported.
24. A maximum of 99 users may access and interact with show data simultaneously. Each user shall have an individual workspace. User identification may be assigned to more than one control device, allowing users to work in tandem, or allowing a designer/ALD to mirror the current display format, mode and command line of the associated programmer. Partitioned control allows discrete control of channel/parameter groupings by user. Partitioned control may be easily enabled and disabled with no need to merge show data from multiple users.
25. The system shall support up to 32 individual simultaneous Time Code inputs or Event lists using Show Control Gateways.
26. Systems that do not provide the above capabilities shall not be acceptable.

B. Controls and Playback

1. Manual Control and Programming Section

- a. The console keyboard shall be grouped by function. Major groupings shall be record target functions, numeric keys, level assignment functions, display navigation functions and controls, as well as non-intensity parameter controls.
- b. The command keypad shall be fully interactive with direct selects and other virtual controls, which provide "one touch" selection of channels, groups, palettes, presets, effects, snapshots and macros.
- c. Non-intensity parameters may be set numerically via an extensible keypad. This control shall be fully interactive with the moving light encoder controls and the virtual controls. The controls shall also access available modes for each parameter type, min and max values for each parameter as applicable, as well as home position on a parameter basis. Each encoder shall support shift functions for fine control. The range of motion of coarse control may be set by the user. Tactile feedback shall indicate full and half frame positioning of certain controls.
- d. Only those parameters available for control in the active lighting system shall be displayed for control. Displays shall condense or lowlight parameters not available to selected channels. Alternatively, the encoders may be placed in a state allowing parameters not applicable to the current selection to be suppressed.
- e. Lamp controls provide direct access to luminaire functions such as striking and dousing arc lamps and calibrating entire fixtures or individual mechanisms of fixtures, as provided by the luminaire manufacturer. User access to these features is normalized across all manufacturers for ease of use. Use of a "control channel" for accessing these functions shall not be required and systems requiring use of control channels for these functions shall not be acceptable.
- f. Fan functions shall be provided both via command line operation and through encoder controls.
- g. Highlight shall be supported, with user definable highlight values. Lowligh conditions may be defined for selected, but not specified channels. Rem Dim commands, at specific levels by channel, may be optionally and automatically called with the highlight command.
- h. Advanced color control functions provide color mixing in any of six different color spaces. Gel matches are provided via gel picker or by command line control. Tinting tools allow adjusting the color mix irrespective of the native mixing system. Spectrum tools support adjusting the output of additive color systems with more than three emitter types, allowing the X/Y coordinate to be held while adjusting the recipe that achieves that mix. Color Path tools allow the user to control the live fade of fixtures through the color space.
- i. The Virtual Media Server function shall allow the user to create layouts of devices, identified as pixel maps. Media content (images, movies, text and procedurally generated effects) may then be applied, manipulated and stored. Stock content is provided and the user may import his own imagery and animations.
- j. Macros may be set to run as default. Default macros called manually shall post to the command line, but executed via cue lists shall run in the background. The user may override this behavior by defining the macro to always execute in the foreground or background, regardless of the recall method. Startup, Shutdown and Disconnect macros may also be defined.

2. Playback Section

- a. The playback faders shall consist of a 100mm Master Fader pair with three control buttons.
- b. Additional playbacks may be defined via external wings and/or virtual fader controls. Faders may be grouped for playback with user definable controls.
- c. It shall be possible to instantaneously halt an active cue, back to the previous cue, manually override the intensity fade or manually override the entire fade.
- d. It shall be possible for a cue list to contribute to the background state or for the contents of each cue list to be withheld from such. Priority and background priority states may be established.
- e. Playback faders shall have the following associated controls:
 - 1) Freeze, which halts the output of the fader
 - 2) Stop Effect, which stops the action of an effect
 - 3) Filter, to assign filter states to a fader
 - 4) Go To Cue 0, to reset a cue list
 - 5) Off, to turn off the contents of a playback, releasing control to the background state or to set to null.
 - 6) Assert, to replay an active cue
 - 7) Release, to release control to the background and reset the cue list.
 - 8) Timing disable, channel filters, parameter filters, priority and background priority status may also be defined.
 - 9) The potentiometer shall be configurable as a proportional master, an intensity master, or manual master. Support for rate, effect rate, effect size and Master Only controls is also provided. Filtered manual timing masters and effects masters may be configured.
 - 10) Rate override and fader paging are supported with a wheel encoder and associated controls.

3. Submasters

- a. Up to 999 proportional, fully overlapping additive or inhibitive submasters may be defined. Submasters shall have colored LEDs to indicate submaster status. Each submaster may have fade up, dwell and down fade times. Submasters may be set to priority and background priority status.
- b. Submasters may be set to HTP or LTP intensity. Non-intensity parameters on submasters shall be LTP only.
- c. Exclusive mode for a submaster shall prohibit the live contribution of that submaster from storing to cues or other submasters. Shield mode prohibits access of associated channels from any other playback or manual control operations.
- d. A submaster potentiometer may be defined as proportional, master only or intensity master. When set as an intensity master, a mark and unmark feature is supplied.
- e. The submaster blind buffer shall be linked directly to live playback.
- f. It shall be possible to set submaster values directly from the command line.
- g. Submasters may be set to fade to background or to minimum value when the fader is returned toward zero.
- h. Submaster values may contribute to the background state or withheld from such.

4. Grand Master Faders

- a. The location of the Grand Master shall be user definable. The grand master shall have associated blackout and blackout enable buttons.
- b. Blackout shall send all associated intensity outputs to zero. Non-intensity outputs shall not be affected.

C. Display Controls

1. Format shall change the view of selected displays.
2. It shall be possible for the user to choose which parameter categories or parameters (s)he wishes to display.
3. Flexichannel modes shall change which channels are viewed in selected displays, as follows:
 - a. No modes
 - b. Masters only/cells only
 - c. Use Partitions
4. Flexichannel states shall change which channels are viewed in selected displays, modified by the modes, as follows:
 - a. All channels
 - b. Patched channels
 - c. Show channels
 - d. Active/Moved channels
 - e. Selected channels
 - f. Manual Channels
 - g. View channels (user identified list)
 - h. Channels with discrete timing
5. Expand shall extend the selected view sequentially across connected displays, vertically or horizontally.
6. [Time] depressed shall display discrete timing data. [Data] suppressed shall display absolute values of referenced data. These functions may be latched.
7. Displays may also be toggled to show stored data currently manually overridden, the source of the current parameter data, output level, patch assignment, part structure and referenced marking data.
8. Playback status displays are provided with a variety of different formats. Indications are provided per cue for live moves (lights fading from zero and also moving non-intensity parameters) and dark moves (inactive lights which have stored non-intensity parameter moves).
9. Display content including which of the workspaces is in focus on any of the two monitors and what views are docked in those workspaces may be instantly recalled using snapshots.

D. Operating Modes

1. Live Mode

- a. Channel lists may be constructed using the +, -, and Thru keys as well as the direct selects. Channel selection and deselection is fully interactive, regardless of the method used.
- b. Levels may also be set with the keypad, level wheel and non-intensity encoders. "Selected" channels shall be those last addressed and under keypad control. Controls are provided for single button access to the last selected channel list, all channels with manual levels and all active channels.
- c. Channels may be set at a user defined default level using the Level key. +% and -% keys adjust channels quickly by user definable values.
- d. Channels and/or channel parameters may be captured. Capture mode shall allow the user to selectively capture channel data at specific levels. Captured data shall be indicated on the Live display.
- e. Sneak shall be used to restore specified channels to background states, default values, or to send them to specified values, in user specified times.
- f. Selected channels may be set at a level or held to current values while all other channels are set to zero using Rem Dim. Toggling Rem Dim shall restore all unselected channels to original levels. The Rem Dim level shall be user definable via the command line or with a default setup value.
- g. Channels may be recorded into groups for fast recall of commonly used channels. 1000 groups shall be available. Groups shall store selection order. The Offset function supports rapid creation of ordered groups, including reverse and random order.
- h. Parameter settings may be stored to Intensity, Focus, Color and Beam Palettes and to Presets. All referenced data may be stored to whole numbers or to up to 99 decimal places between each whole number.
- i. The following conditions may be placed on a channel or channel parameter to be included with a cue record action.
 - 1) Discrete fade time and/or delay
 - 2) Block flag
 - 3) Assert flag
 - 4) IFCB Filters, which may be set at a parameter level.
 - 5) and Restore
- j. 999 cue lists may be stored. Cues may be recorded in any order. Up to 99 decimal cues may be inserted between any two whole number cues. Each cue may contain a maximum of twenty parts.
- k. It shall be possible to record cues and cue parts with the following information:
 - 1) Any collection of channel data, as determined by the use of "Record", "Record Only" or selective store commands, combined with parameter filters.
 - 2) Cue Level timing and delays for Intensity Up, Intensity Down, Focus, Color and Beam.
 - 3) Follow or hang time
 - 4) Link instruction
 - 5) Loop value
 - 6) Block, Assert, Preheat, and/or Mark Flag
 - 7) Curve

- 8) Allfade
- 9) Label and note
- 10) Execute list to trigger other activity

- l. Non-intensity channel parameters may be marked (preset), in two ways. Automark presets any parameters transitions in the cue just prior to intensity becoming active. Automark may be disabled on a cue or cue part basis, enabling a "live" move. Alternatively, non-intensity parameters may be marked to a specific cue with a single command instruction. It shall not be necessary to store these parameters directly into the cue in which the movement is to occur.
 - m. Any channel parameter may be stored with an effect instruction. These effects may contain relative offsets from current value, or absolute instructions. Effects may be progressive action or on/off states. Entry and exit behaviors shall modify the channel parameters activity when beginning and ending the effect.
 - n. Update may be used to selectively add modified parameter data quickly to that parameter' s current source. Update may be specified to modify referenced data content or break the link to that content. A dialogue informs the user of the content that will be updated. A trace command may be used to modify the data to the original source of its move instruction. It shall be possible to update inactive record targets.
 - o. Recall From quickly pulls specified data from record targets or other channels into the current view.
 - p. Copy To quickly copies selected data to specified channels or other record targets.
 - q. Address and channel check functions shall be provided.
 - r. Channel parameters may be "parked" at levels. Those levels are not added to any live record operations, nor may they be changed until the parked element is "unparked". Scaled park provides real time proportional adjustment of stored intensity values. Address Park shall also be provided.
 - s. About shall provide detailed status of selected channels or specified record targets. This shall include current source, current value, discrete timing, parked value, marked to and for indications. Background levels and current DMX output are also displayed. Channel usage indicates submaster and cue information and also provide a "dark moves" report on a per channel basis.
 - t. 1000 snapshots may be stored which instantly recall specified front panel and display configurations.
 - u. Live data may be displayed in a summary view or detailed table orientation.
 - v. Query shall allow selection of channels by their current or possible state. Keywords and fixture types shall allow quick access to fixtures.
 - w. User definable home positions, on a per channel basis, may be defined.
 - x. Channel level offset commands provide channel ordering and sub-grouping functions.
 - y. Undo shall be used to sequentially step back through manual operations or to undo record and delete actions. It shall be possible to undo multiple commands in one action.
2. Blind
- a. The Blind display allows viewing and modification of all record targets without affecting stage levels.

- b. Record target data may be displayed in a summary view, a detailed table orientation or a spreadsheet view, which allows quick data comparisons, move and replace functions.
 - c. Changes to blind data shall be automatically stored. Range selection of both record targets and channels shall be supported.
3. Patch Display
- a. Patch shall be used to display and modify the system control channels with their associated library data.
 - b. Each channel may be provided with a proportional patch level, curve, label, swap and invert functions, as well as keywords to service Query.
 - c. Offset functions in patch shall allow selection of channel ranges and shall allow the user to establish a "custom" footprint for any device output.
 - d. Custom color wheels, color scrolls and gobo wheels shall be defined in patch. These devices shall be created with a simple table and graphical user interface supported by images of major manufacturers.
 - e. RDM discovery and device monitoring shall be supported.
 - f. Copy to and Move functions shall be supported in patch.
4. Setup/Browser
- a. Setup shall access system, user and device configurations.
 - b. It shall be possible to partially import Eos show files. Users shall be able to select as much or as little of the show file as required, with renumber tools.
 - c. It shall be possible to import ASCII and Lightwright data files. It shall be possible to export as ASCII or .csv.
 - d. Setup shall also access show data storage, import, export, print to .pdf and clear functions, as well as show data utilities.
 - e. The system shall support programming and playback of real time clock events, including cue, submaster and macro execution at specific times of specified days or at a time based on astronomical events.
 - f. A control screen shall be provided for network configuration, selecting date/time, software update controls, selecting functional language and/or keyboard for labeling option, as well as other system level tools.
 - g. Available languages for prompts, advisories and help messages shall include English, Bulgarian, German, Spanish, French, Italian, Japanese, Korean, Russian, Chinese, simplified and Chinese, traditional.
 - h. Supported keyboards shall include American, United Kingdom, French, German, Italian, Korean, Norwegian, Russian, Slovakian, Turkish, Swiss, Swedish, Finnish and Bulgarian.

E. Dimmer Monitoring and Configuration

- 1. The lighting control system shall provide communication with an ETC Sensor+, Sensor3 or FDX dimming system for remote monitoring and configuration of show specific functions from within the software application.
- 2. Circuit level configuration and monitoring functions shall include but not be limited to:

- a. Control mode (dimnable, switched, latch-lock, always on, off or fluorescent).
 - b. Curves
 - c. Control threshold
 - d. Min and Max Scale Voltage
 - e. Preheat
 - f. Scale load
3. Rack status messages shall include but not be limited to:
- a. State of UL924 panic closure
 - b. DMX port error/failure
 - c. Network error/failure
 - d. A, B, C Phase below 90 or above 139 volts and headroom warning
 - e. Ambient temperatures out of range
4. Circuit status shall include but not be limited to:
- a. Module type and location
 - b. Output level
 - c. Control Source
 - d. Overtemp
5. Advanced circuit feedback shall include but not be limited to:
- a. Load higher or lower than recorded value
 - b. DC detected on output
 - c. SCR failed on/off
 - d. Breaker trip
 - e. Module has been removed
 - f. Load failure
 - g. Shutdown due to Overtemp

F. Interface Options

1. The console shall support a variety of local interfaces.
 - a. AC input
 - b. USB (five ports for items such as alpha-numeric keyboard, mouse, touch screens, USB Flash drive)
 - c. Ethernet (two ports)
 - d. Two Display Port output connectors, supporting Windows 7 compliant monitors as 1280x1024 resolution minimum. Touchscreen/multi-touch support of any/all of these monitors is provided.
 - e. Contact Closure trigger via D-Sub connector
 - f. 4 DMX/RDM ports
 - g. Alternative Contact Closure trigger through Gateway
 - h. OSC Transmit/Receive
 - i. MIDI In/Out, MSC and MIDI Notes through Gateway
 - j. SMPTE Timecode through Gateway

G. Accessories

1. ETCPad (ETC Portable Access Device)
2. iRFR and iRFR Preview (applications for iPhone, iPod Touch and iPad units)
3. aRFR (application for Android devices)
4. Net3 Remote Video Interface
5. 20 Fader or 40 Fader non-motorized fader wings
6. 10 Fader or 20 Fader motorized fader wings
7. Gateways
 - a. Net3/ETCNet 2 to DMX/RDM Gateways (one to four ports)
 - b. MIDI/SMPTE Gateway
 - c. I/O Gateway with 12 analog inputs, 12 SPDT contact outputs, RS-232 interface

H. Synchronized Backup

1. An optional Backup system shall consist of one of the following combinations of devices:
 - a. Two networked Consoles.
 - b. One (or more) Console with one Remote Processor Unit (RPU)
 - c. One (or more) Consoles with two Remote Processor Units (RPUs)
 - d. ETCnomad/Puck

I. Physical

- J. All operator controls and console electronics for a standard system shall be housed in a single desktop console, not to exceed 20" wide, 15" deep, 4.5" high, weighing 12.7 pounds. Console power shall be 90 – 240V AC at 50 or 60Hz, supplied via a detachable locking power cord.

2.7 DATA PLUG-IN STATIONS

A. General

1. The Plug-in Stations shall consist of the appropriate connectors required for the functional intent of the system. These stations shall be available with DMX input or output, Remote Focus Unit, Network, or architectural control connectors. Custom control connectors shall be available.

B. Connector Options

1. The following standard components shall be available for Plug-in Stations:
 - a. 5-Pin male XLR connectors for DMX input
 - b. 5-Pin female XLR connectors for DMX output
 - c. 6-Pin female XLR connectors for RFU and ETCLink connections
 - d. RJ45 connectors for Network connections - Twisted Pair
 - e. 6-Pin female DIN connectors for Unison connections
 - f. DB9 female serial connector for architectural control from a computer

2. Custom combinations and custom control connections shall be available.

C. Physical

1. Station faceplates shall be .80" aluminum, finished in fine texture, scratch-resistant black powder coat. Silk-screened graphics shall be white.
2. The station panel shall mount into an industry standard back box, depending on size and quantity of connectors. A terminal block shall be supplied for contractor terminations.

2.8 GENERAL NETWORK

A. General

1. The Electronic Theatre Controls Net3 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, Net3 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.
 - a. 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.

- b. The lighting system shall support assignment of DMX offsets, truncation of DMX universes, and provide choice of DMX port prioritization.
 - c. 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.
 - d. Lighting systems that do not support the above mentioned address patching capabilities shall not be suitable.
3. The system shall allow assignable labels for all network devices to allow easy identification by system users.
 4. 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.
 5. 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.
 6. 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.
 7. 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.
 8. The Net3 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.
 9. 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 without 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.

2.9 CONTROL SYSTEM CONFIGURATION SOFTWARE

A. System Configuration

1. The Lighting Control System Configuration software shall be the Concert software as manufactured by Electronic Theatre Controls, Inc., or equal.
2. Definitions
 - a. A system is more than one Net3 or RDM device
 - b. A fixture is a controllable entity with one or more attributes
 - c. An attribute is a parameter of control such as IP address or dimmer number
 - d. A group is a selection of devices that can be stored and recalled
 - e. A space is defined area where other system objects reside. A space defines the scope of Control for other objects.
 - f. An indicator is a single point of feedback from the system (e.g. LED, Label on LCD)
 - g. Linking is the process of associating a logical instance of a device within the configuration with a physical device discovered at runtime
3. Environment
 - a. There shall be clipboard functionality (cut, copy, paste) for entire objects, settings, and text.
 - b. The application interface shall be based around (i) a tree-view; (ii) a workspace area; (iii) a properties inspector; (iv) item selector.
 - c. It shall be possible to represent data about the workspace area graphically (plan) or in spreadsheet form.
 - d. Plan views shall support zoom.
 - e. Plan views shall support a layout grid with user-defined spacing and color with associated snap-to-grid functionality.
 - f. The properties inspector shall be used to view and modify the properties of one or multiple devices.
 - g. It shall be possible to enter user-configurable names in any language supported by the device(s).
 - h. User-configurable device names
 - i. Help functionality shall be accessed from within the application.

4. System Configuration

- a. It shall be possible to create Logical Spaces that contain a subset of devices or objects from a parent logical space, or from the world view.
- b. It shall be possible to add devices by selecting a device from the provided library.
- c. It shall be possible to work online with a live system, or offline.
- d. It shall be possible to create a system based on discovery of online devices by generating a logical network map of all supported, online devices.
- e. It shall be possible to export system configuration data to individual device configuration files
- f. There shall be a process for linking physical and logical devices
- g. There shall be a 2-dimensional plan view that displays devices
- h. Items displayed on the plan may be arranged using standard graphical interaction methods (e.g. drag-and-drop)
- i. It shall be possible to import images JPEG, BMP and GIF formats as a background image to the plan view

5. Device Configuration

- a. There shall be functionality to configure RDM devices by connection through a DMX gateway or other protocol converter.
- b. There shall be support for configuration of supported ETC networked products based Ethernet devices.
- c. New devices shall be added using a simple device package import, without the need for a new software version.
- d. Device configuration shall be supported by editing properties in the property editor, or through use of a purpose built mini-editor.

6. Network

- a. Shall display a topological view of devices connected
- b. Can associate a device with a specific view or views
- c. Shall report online status of all supported devices
- d. Shall allow for configuration of network properties (IP) of devices
- e. Shall allow for upload of configuration data to all or individual device or an entire system
- f. Shall allow for download of configuration data from a single device or an entire system
- g. Shall allow for download of logging data from a system with ETC Conductor
- h. Shall allow for discovery and linking of devices

B. Minimum Computer Requirements

- 1. The software shall require the following minimum hardware specification
 - a. PC
 - 1) Windows /10 (any full version)
 - 2) 2GHz processor (dual or quad core recommended)

- 3) 1GB RAM (2GB or more recommended)
- 4) Video card capable of 1024 x 768 resolution (1280 x 1024 or higher recommended)
- 5) Support for OpenGL
- 6) Ethernet port
- 7) Keyboard, mouse and monitor, USB port (to use Gadget for RDM device configuration)

b. Mac

- 1) OS X Mojave (v10.14.3) or later
- 2) Multi-core processor with clock frequency higher than 2.0 GHz

2.10 DMX ETHERNET GATEWAY – ONE PORT

A. General

1. The lighting control gateway shall be a microprocessor-based unit specifically designed to provide DMX-512 control of lighting systems and transport of RDM configuration and status messages. 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 Response Mk2 1-port DMX 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 E1.17 Architecture for Control Networks (ACN)
 - b. ANSI E1.31 Streaming ACN (sACN)
 - c. ANSI E1.11 USITT DMX512-A
 - d. ANSI E1.20 Remote Device Management (RDM)
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 UKCA compliant.
9. The gateway shall have a backlit OLED display and four buttons for identification (soft-labeling), configuration, status reporting and troubleshooting
 - a. Labeling shall be user configurable using ANSI E1.17 Architecture for Control Network (ACN), or a purpose built software configuration tool.
 - b. The OLED display shall show DMX port configuration indication as well as indicate the presence of valid signal.
 - c. Gateways that do not indicate port configuration (input/output) and valid data shall not be acceptable.
10. Each gateway shall have LED indicators for Power and network activity

B. DMX Ports

1. The DMX Port shall comply with the requirements of ANSI E1.11 USITT DMX512-A standards.
2. The DMX port shall be software-configurable for either input or output functionality.
3. DMX input shall be optically-isolated from the gateway electronics.
4. DMX port shall provide at least 500V isolation to ground and the rest of the electronics
5. The DMX port shall incorporate one DMX512-A Connection
 - a. Gateways shall be available with the following connection options: 5-pin male XLR, 5-pin female XLR, or Ethercon RJ-45, for DMX wiring.
6. Network gateways that do not indicate input/ output port configuration or indication of valid data shall not be accepted

C. Processor

1. Each gateway shall have sufficient processing power to manage up to 63,999 universes (32,767,488 addresses).
2. Maximum delay time from input to output shall not be greater than one packet time (approximately 22 mSec.).
3. 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 shall be available in two versions
 - a. Wall-mount gateway
 - 1) The gateway faceplate shall be constructed of injection molded plastic and be formed for use with any standard Decorator style faceplate
 - 2) A color matched faceplate shall be provided with the gateway
 - 3) Gateways shall be available in four standard colors
 - a) Cream (RAL 9001)
 - b) Gray (RAL 7001)
 - c) Black (RAL 9004)
 - d) Signal White (RAL 9003)
 - 4) The gateway shall support flush mounting using a standard RACO 1-gang, deep back box or equivalent.
 - a) Surface mounting shall also be supported using a manufacturer supplied back box.
 - b. Portable gateway

- 1) The portable gateway shall include a complete enclosure finished in a black or white fine texture powder coat paint
- 2) Wiring connections shall be required for connection to the lighting system
 - a) Ethernet connection that supports standard Cat5 patch cables or Ethercon cables. Gateways that do not support the use of Ethercon cables shall not be accepted
 - b) DMX input or output connections using is 5-pin XLR or RJ45 Ethercon style connector
 - c) Optional low-voltage DC power input connection

E. Power

1. Power for the gateway shall be provided over the Category 5 (or better) cable, utilizing IEEE 802.3af compliant Power over Ethernet (PoE). Power consumption using shall not be greater than 4 watts.
2. An optional 12-24vDC power input shall be available for all wall-mount gateways

F. Configuration

1. The Gateway must support local or remote configuration.
2. Each gateway on the network shall be individually configurable using freely available software configuration tools. The primary configuration tool shall be Net3 Concert configuration software running on a network connected computer. The computer shall only be required for configuration, and shall not be required for normal operation of the system.
3. Each DMX gateway shall control up to 512 DMX addresses, within the confines of 63,999 universes.
4. The specific DMX data input or output by the gateway shall be freely configurable by the user.
5. Multiple DMX universes may be configured with any length up to 512 total addresses. Any range of DMX input addresses shall support selection and routing to the specified sACN output.
6. Multiple sACN sources may be combined with a priority may be assigned to each source sending data to the gateway.
7. All relevant routing information shall be stored in non-volatile memory at each gateway. The system shall recover from a power outage without requiring the configuration PC to be online. Gateways that do not support non-volatile storage of data routing shall not be accepted

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 E1.17 Architecture for Control Networks (ACN) and ANSI E1.31 streaming ACN (sACN) shall be supported. Gateways that do not support ANSI E1.17 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 63,999 universes (32,767,488 addresses) using Streaming ACN (sACN).
 - a. Any range of DMX addresses may be selected for each universe.
 - b. 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.
 - c. Each DMX port shall support its own universe and start address.
7. Gateways shall support 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 channel 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 Net3 Concert Configuration and monitoring 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.

2.11 DMX ETHERNET GATEWAY – TWO PORT

A. General

1. C
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 E1.17 Architecture for Control Networks (ACN)

- b. ANSI E1.31 Streaming ACN (sACN)
 - c. ANSI E1.11 USITT DMX512-A
 - d. ANSI E1.20 Remote Device Management (RDM)
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 UKCA compliant.
9. The gateway shall have a graphic OLED display and four buttons for identification (soft-labeling), configuration, status reporting and troubleshooting
 - a. Labeling shall be user configurable using ANSI E1.17 Architecture for Control Network (ACN), or a purpose built software configuration tool.
 - b. The OLED display shall show DMX port configuration indication as well as indicate the presence of valid signal.
 - c. Gateways that do not indicate port configuration (input/output) and valid data shall not be acceptable.
10. Each gateway shall have power and network activity LEDs on the front of the gateway

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. DMX input shall be optically-isolated from the gateway electronics.
4. DMX Port shall provide at least 500V isolation to ground and the rest of the electronics
5. Each port shall incorporate one DMX512-A Connection
 - a. Gateways shall be available with the following connection options: 5-pin male XLR, 5-pin female XLR, or Ethercon RJ-45, for DMX wiring.
6. Network gateways that do not indicate input/ output port configuration or presence of valid data shall not be accepted

C. Processor

1. Each gateway shall have sufficient processing power to manage up to 63,999 universes (32,767,488 addresses).
2. Maximum delay time from input to output shall not be greater than one packet time (approximately 22 mSec.).
3. 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. Gateway bezels shall be constructed of cast zinc finished in a fine texture powder coat.
 - a. Gateways shall be available in four standard colors

- 1) Cream (RAL 9001)
- 2) Gray (RAL 7001)
- 3) Black (RAL 9004)
- 4) Signal White (RAL 9003)

b. The bezel shall have no visible means of attachment

2. Gateways shall support surface, flush and portable mounting options

- a. Flush-mount to industry standard 2-gang back box
- b. Surface back box dimensions shall be 7.3" wide x 4.8" high x 3.5" deep and available from the manufacturer
- c. Portable gateway
 - 1) The portable gateway shall include a complete enclosure finished in a black or white fine texture powder coat paint
 - 2) Wiring connections shall be required for connection to the lighting system
 - a) Ethernet connection that supports standard Cat5 patch cables or Ethercon cables. Gateways that do not support the use of Ethercon cables shall not be accepted
 - b) DMX input or output connections using is 5-pin XLR or RJ45 Ethercon style connector
 - c) Optional low-voltage DC power input connection

E. Power

1. Power for the gateway shall be provided over the Category 5 (or better) cable, utilizing IEEE 802.3af compliant Power over Ethernet (PoE). Power consumption using shall not be greater than 4 watts.
2. An optional low-voltage DC power input shall also be available utilizing an isolated in-line power supply capable of an operating range of 12-24vDC.

F. Configuration

1. The Gateway must support local or remote configuration.
2. Each gateway on the network shall be individually configurable using freely available software configuration tools. The primary configuration tool shall be Net3 Concert configuration software 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.
3. Each DMX gateway shall control up to 512 DMX addresses, within the confines of 63,999 universes.
4. The specific DMX data input or output by the gateway shall be freely configurable by the user.
5. Duplicate outputs of DMX lines (DMX splitter) and discrete outputs shall be fully supported.
6. Multiple DMX universes may be configured with any length up to 512 total addresses. Any range of DMX input addresses shall support selection and routing to the specified SACN output.

7. Multiple sACN sources may be combined with a priority may be assigned to each source sending data to the gateway
8. All relevant routing information shall be stored in non-volatile memory at each gateway. The system shall recover from a power outage without requiring the PC to be online. Gateways that do not support non-volatile storage of data routing shall not be accepted

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 E1.17 Architecture for Control Networks (ACN) and ANSI E1.31 streaming ACN (sACN) shall be supported. Gateways that do not support ANSI E1.17 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 63,999 universes (32,767,488 addresses) using Streaming ACN (sACN).
 - a. Any range of DMX addresses may be selected for each universe.
 - b. 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.
 - c. Each DMX port shall support its own universe and start address.
7. Gateways shall have built in DMX merger capability on a universe or channel-by-channel basis.
8. 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. A Universal Power Supply with international plug-set shall be available. Multiple power supplies shall be able to fit in a vertically stacked power strip.
3. ETC Net3 Concert Configuration and monitoring 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 MiddletonWI

2.12 DMX ETHERNET GATEWAY – FOUR PORT

A. General

1. The lighting control gateway shall be a microprocessor-based unit specifically designed to provide DMX-512 control of lighting systems and transport of RDM configuration and status messages. 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 Response Mk2 4-port DMX 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 E1.17 Architecture for Control Networks (ACN)
 - b. ANSI E1.31 Streaming ACN (sACN)
 - c. ANSI E1.11 USITT DMX512-A
 - d. ANSI E1.20 Remote Device Management (RDM)
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 UKCA compliant.
9. The gateway shall have a graphic OLED display and four buttons for identification (soft-labeling), configuration, status reporting and troubleshooting
 - a. Labeling shall be user configurable using ANSI E1.17 Architecture for Control Network (ACN), or a purpose built software configuration tool.
 - b. The OLED display shall show DMX port configuration indication as well as indicate the presence of valid signal.
 - c. Gateways that do not indicate port configuration (input/output) and valid data shall not be acceptable.
10. Each gateway shall have power and data activity LEDs on the front of the gateway

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 or locally-configurable for either input or output functionality.
3. DMX input shall be optically-isolated from the gateway electronics.
4. DMX Port shall provide at least 500V isolation to ground and the rest of the electronics
5. Each port shall incorporate one DMX512-A Connection

- a. Gateways shall be available with the following connection options: 5-pin male XLR, 5-pin female XLR, Ethercon RJ-45, or terminal strip for DMX wiring.
 6. Network gateways that do not indicate input/ output port configuration or presence of valid data shall not be accepted
- C. Processor
1. Each gateway shall have sufficient processing power to manage up to 63,999 universes (32,767,488 addresses).
 2. Maximum delay time from input to output shall not be greater than one packet time (approximately 22 mSec.).
 3. 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 shall be fabricated of 16-gauge steel, finished in fine-texture, scratch-resistant, black powder coat (RAL 9004).
 2. The gateway shall support table top use
 3. The gateway shall support field configuration allowing the Ethernet port to be either on the front or the rear of the unit
 4. Optional accessories for rack-mount and pipe applications shall be available from the manufacturer. These accessories shall support installation by an end-user
- E. Power
1. Power for the gateway shall be provided over the Category 5 (or better) cable, utilizing IEEE 802.3af compliant Power over Ethernet (PoE). Power consumption using shall not be greater than 7 watts.
 2. An optional low-voltage DC power input shall be available utilizing an isolated in-line power supply capable of an operating range of 12-24VDC.
- F. Configuration
1. The Gateway must support local or remote configuration.
 2. Each gateway on the network shall be individually configurable using freely available software configuration tools. The primary configuration tool shall be Net3 Concert configuration software 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.
 3. Each port of the DMX gateway shall control up to 512 DMX addresses, within the confines of 63,999 universes.
 4. The specific DMX data input or output by the gateway shall be freely configurable by the user.
 5. Duplicate outputs of DMX lines (DMX splitter) and discrete outputs shall be fully supported.

6. Multiple DMX universes may be configured with any length up to 512 total addresses. Any range of DMX input addresses shall support selection and routing to the specified sACN output.
7. Multiple sACN sources may be combined with a priority may be assigned to each source sending data to the gateway
8. All relevant routing information shall be stored in non-volatile memory at each gateway. The system shall recover from a power outage without requiring the PC to be online. Gateways that do not support non-volatile storage of data routing shall not be accepted.

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 E1.17 Architecture for Control Networks (ACN) and streaming ACN (sACN) shall be supported. Gateways that do not support ANSI E1.17 shall not be acceptable.
5. Each DMX gateway shall control up to 512 DMX addresses, per DMX port within the confines of up to 63,999 universes (32,767,488 addresses) using Streaming ACN (sACN).
 - a. Any range of DMX addresses may be selected for each universe.
 - b. 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.
 - c. Each DMX port shall support its own universe and start address.
6. Gateways shall have built in DMX merger capability on a universe or channel-by-channel basis.
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 unit to be mounted in three orientations
 - a. U-Bolt or C-Clamp mounting hardware shall be available
2. One E.I.A. rack space mounting bracket kit shall support either one or two complete units and allow for up to eight ports of DMX

3. Front Access Panel kit shall allow the connectors on the rear of the gateway to be accessed from the front of an equipment rack. Options for 5-pin XLR style connectors that support DMX input or output shall be available
4. A Universal Power Supply with international plug-set shall be available. Multiple power supplies shall be able to fit in a vertically stacked power strip.
5. ETC Net3 Concert Configuration and monitoring Software

J. System Requirements

1. Provide the quantity and type of gateways required, as scheduled. Gateways and software shall be as manufactured by ETC Inc. of Middleton, WI.

2.13 INTELLIGENT BREAKER SYSTEM

A. General

1. Intelligent breaker system shall be 120V Sensor IQ as manufactured by ETC, Inc., or equal
2. Breaker Panels shall be UL508, UL67, and UL924 Listed, and shall be so labeled when delivered
3. Breakers shall be UL489 listed and shall be labeled when delivered
4. Breaker Panels shall consist of a main enclosure with 12, 24, or 48 pole breaker subpanels, integral control electronics for low voltage terminations and provision for accessory cards
 - a. Up to two accessory cards shall be supported per breaker panel

B. Mechanical

1. The panel shall be constructed of 16-gauge galvanized steel. All panel components shall be properly treated or finished in fine-textured, scratch resistant paint
2. Breaker panels shall be capable of being mounted on the surface of a wall or recessed mounted
3. Breaker panels shall be available in 12, 24, and 48 pole configurations
 - a. 12 pole MLO (No provision for main Breaker)
 - 1) 31 inches high, 14.25" wide and 4" deep (with front panel attached)
 - b. 12 pole (with provision to add main breaker)
 - 1) 40.25 inches high, 14.25" wide and 4" deep (with front panel attached)
 - c. 24 pole (with provision to add main breaker)
 - 1) 50.25 inches high, 14.25" wide and 4" deep (with front panel attached)
 - d. 48 pole (with provision to add main breaker)

- 1) 64 inches high, 20" wide and 5.25" deep (with front panel attached)
4. Choice of panel covers shall be available for surface or recess mount applications. This outer panel shall ship complete with a locking door to limit access to electronics and breakers
 - a. Optional center-pin reject security screws shall be available for all accessible screws
 - b. Optional recess mount doors shall extend 1" beyond all panel edges to hide wall cut-out
5. The unit shall provide interior cover over the control electronics and accessory cards to allow access only to class 2 wiring and prevent direct access to class 1 line voltage components
6. The panel shall support up to twelve, twenty-four, or 48 single pole branch circuits
 - a. Branch circuits shall range from 15A to 30A capable of holding full rated load for minimum of three hours continuously
 - b. Two and three-pole circuits shall be supported at decreased density where each pole constitutes one of the available single-pole circuits. Mixing of circuits in any combination shall be supported
7. Breakers shall provide manual switching control while power is unavailable to the panel such that critical lighting can be set to an on state, without the need for power to the panel
8. Breaker output lugs shall accept 10-14 AWG dual conductor wire
9. Breaker output lug shall support solid or stranded 6-14 AWG class B, C, or K copper wire
10. Control wiring for DMX, station bus, and Emergency input terminations shall land on a removable headers for contractor installation

C. User Interface

1. The user interface shall contain an LCD display with button pad to include 0-9 number entry, up, down back arrow navigation and enter
2. Test shortcut button shall be available for local activation of preset, sequence and set level overrides
3. The user interface shall have a power status LED indicator (Blue), a DMX status LED indicator (Green), a network status LED indicator (Green) and an LED indicator (red) for errors
4. Interface shall allow the backlight to timeout and shall provide user editable options to shut off backlight completely as well as adjust screen contrast
5. Ethernet interface shall default to automatic IP through link local and DHCP. Upon receiving IP address, the address of the Network Interface Card (NIC) shall display in the about menu. Static address and settings shall also be possible
6. The control interface shall support a USB memory stick interface for uploads of configurations and software updates
7. The user interface shall support power input from an external Uninterruptible Power Supply (UPS) supplying 800W-2400W AC power

D. Functional

1. Panel setup shall be user programmable. The control interface shall provide the following breaker setup features (per circuit):
 - a. Type (1 pole, 2 pole, or 3 pole)
 - b. Name
 - c. Circuit Number
 - d. DMX address
 - e. sACN address
 - f. Space Number
 - g. Circuit Mode
 - 1) Normal (priority and HTP based activation and dimming)
 - 2) Latch-lock
 - 3) Fluorescent
 - 4) DALI
 - h. On threshold level
 - i. Off threshold level
 - j. Include in UL924 emergency activation
 - k. Allow Manual
2. Breaker panels shall support discrete addressing of each breaker. Panels that are restricted to use of start address with sequential addressing, and cannot assign each 0-10V output control to any internal circuit shall not be acceptable
3. The panel shall be capable of switching 6 poles on or off at once, or in a user-selectable delay per breaker using a period of 0.1 to 60 seconds, in 0.1 second increments
4. An Ethernet connection shall provide advanced control of relays over streaming ACN (sACN) and transmit status, control override, and measured energy usage per branch circuit via an internal Web UI or central monitoring interface
 - a. Control electronics shall report the following information per branch circuit.
 - 1) Breaker state (On/Off)
 - 2) Breaker state (Open/Closed)
 - 3) Current draw (In Amps)
 - 4) Voltage
 - 5) Energy usage
 - b. Panels that do not report this information shall not be acceptable.
5. Built-in Control shall include:
 - a. Ability to record up to 16 presets in each space from the control panel, connected control stations, or timed events
 - b. Presets shall be programmable by recording current levels (as set by DMX or connected control stations), by entering levels on the control panel directly, manually selecting breaker state on each breaker, or a combination of these

- methods. From the control panel, stations, or timed events it shall be possible to record values for up to 16 zones per space
- c. Up to 8 spaces in a single rack for total of up to 16 spaces shall be supported per system or system subne
 - d. Indication of an active preset shall be visible on the control panel display
 - e. One 16-step sequence per space for power up and power down routines
 - f. The panel shall have a UL924-listed contact input for use in Emergency Lighting systems. The panel shall respond to the contact input by setting included breakers to "on", while setting non-emergency breakers "off". Each breaker can be selected for activation upon contact input
 - g. Upon Data loss the system shall provide options to hold last look infinitely or hold for a configured time period set by the installing technician then fade/switch to the input of the next available priority
 - h. Control electronics shall respond directly to control stations for zone, preset, and sequence control. Systems that require secondary control systems for this functionality are not acceptable
 - i. After power loss, electronics shall be capable of holding the system in its previous state until new level data (DMX, architectural presets, sequences and zones, or local overrides) is received to make each breaker change state
6. The control of lighting and associated systems via timed and Astronomical clock controls
- a. The breaker panel shall allow the activation of presets, sequence, and zone programming of up to 50 time clock events via a built in real and astronomical time clock
 - b. System time events shall be programmable via the control panel
 - 1) Time clock events shall be assigned to system day types. Standard day types include: everyday, weekday, weekend, Sunday, Monday, Tuesday, Wednesday, Thursday, Friday and Saturday
 - 2) Time clock events shall be activated based on sunrise, sunset, time of day or periodic event
 - 3) System shall automatically compensate for regions using a fully configurable daylight saving time
 - 4) Presets shall be assigned to events at the time clock
 - c. The time clock shall support event override
 - 1) It shall be possible to override the timed event schedule from the face panel of the time clock
 - d. The time clock shall support timed event hold
 - 1) It shall be possible to hold a timed event from the face panel of the processor
 - 2) Timed event hold shall meet California Title 24 requirements
7. The panel shall receive ESTA DMX512-A control protocol. Addressing shall be set via the user interface button keypad with any circuit patched to any DMX control address

- a. 2,500V of optical isolation shall be provided between the DMX512 inputs and the control electronics as well as between control and power components
- b. The breakers shall respond to control changes (DMX or Stations) in less than 25 milliseconds. DMX512 update speed shall be 40Hz
- c. Setting changes shall be able to be made across all, some, or just one selected breaker in a single action from the face panel
- d. DMX data loss shall allow for levels/breakers to be held for ever or for a specified time before switching to a lower priority source
- e. Initial Panel setup
 - 1) The breaker panel shall automatically detect the type of breaker or dimmer installed in each location without need for manual configuration of the physical arrangement
 - 2) Quick rack setup shall be available to apply address settings across all circuits for rack number, DMX Start Address, sACN universe, and sACN start address
 - 3) Emergency Setup Menu shall provide optional delays when emergency is activated or deactivated, and option to turn off non-emergency circuits shall be available. Record function shall allow circuits that are turned on to be added to the emergency setting

E. Electrical

1. Breaker Panels shall be available to support power input from:
 - a. 120/208V three phase 4-wire plus ground
 - b. 120/240V single phase 3-wire plus ground
2. Conduit Entry:
 - a. Feeders:
 - 1) Top or upper 6" of either side
 - 2) Bottom or lower 6" of either side
 - 3) Feeders shall enter through the top or bottom according to the orientation of the enclosure.
 - 4) Feeder entry shall be nearest to the location of the feeder lugs or main breaker.
 - b. Load:
 - 1) Load wiring shall enter through the top or bottom of the enclosure through the surface nearest to the breaker sub panel
 - 2) Load wiring may also enter through left and/or right side provided a low voltage chase is not required through the same area. If class 2 chase is required, a field installable barrier panel shall be provided upon request. The side of the panel where the barrier has been installed shall not permit load wiring
 - c. Low Voltage:

- 1) Top or upper 6" of either side
- 2) Bottom or lower 6" of either side
- 3) For low voltage conduit entry at the breaker end of the cabinet, conduits shall be located at the outer 3" of the top/bottom panel

3. Breaker

- a. Bus connection type: Stab on
- b. 1, 2, or three poles
- c. UL489 listed
- d. 15 amp, 20 amp, or 30 amp
- e. 22,000 SCCR; 65,000A series rated with main breaker
- f. High inrush trip curve (matches all Sensor breakers)
- g. Maintains trip curve through entire thermal range
- h. Guaranteed not to trip at full load
- i. Load lugs accept 6-14awg load wiring
- j. Multi-conductor listed output terminal
- k. Integral mechanically held air gap relay
- l. Manual control of relay state using breaker handle w/o power
- m. Integral current sensing
- n. Integral position and trip sensing
- o. Control and status provided by contact pads directly at bottom of the breaker case
- p. No external wires or connections required for control or feedback
- q. The breaker shall be capable of switching up to 30A

4. The breaker panel shall support a maximum feed size

- a. 100 Amps at 12 circuits
- b. 200 Amps at 24 circuits
- c. 400 Amps at 48 circuits

5. Breaker panels shall support main circuit breaker options:

6. Main breaker options shall be optional and available for purchase upon request

7. Main breakers shall be field installable

8. Main breakers shall be available in up to 100 Amps for 12 circuit panels, up to 200 Amps for 24 circuit panels, and up to 400A for 48 circuit panels at 120V

9. Series SCCR ratings apply as follows with appropriate main breaker:

- a. 22,000A or 64,000 at 120/208V

10. Main breakers shall allow the following range of wire sizes:

- a. Up to 300kcmil at 100A and 200A
- b. Up to 2x250kcmil at 400A

11. Main Lug input shall support up to 2x250kcmil

12. Breaker panel shall support a 500kcmil main lug option for 48-circuit panels

F. Breaker remote switching ratings

1. Mechanical 1,000,000 cycles
2. 24A Resistive 100,000 cycles
3. 16A Ballast (HID) 75,000 cycles
4. 15A Electronic (LED) 100,000 cycles
5. 15A Tungsten 45,000 cycles
6. 30FLA; 180 LRA Motor Load 50,000 cycles
7. Tested duty cycle: 12 operations (6 cycles) per minute
8. Decreasing duty cycle significantly increases switch life
9. Isolation: 4000V RMS
10. Current reporting accuracy: 5%
11. Latching state mechanical relay

2.14 EMERGENCY BYPASS DETECTION KIT (EBDK)

A. Emergency bypass Detection

1. Where required to detect the loss of normal power and trigger special-purpose lighting presets, the detection means shall be the Emergency Bypass Detection Kit as manufactured by Electronic Theatre Controls, Inc., or equal.

B. Mechanical

1. The Kit Enclosure shall be a surface mounted, constructed of 16-gauge, formed steel panels with a removable front cover.
2. The Emergency Bypass Detection Kit shall include a 3-pole, 10 amp breaker for local over-current protection and simulation of normal power loss.
 - a. The enclosure shall have a lockable door to allow limited access to the over-current protection breaker
3. All components shall be properly treated and finished.
 - a. Exterior surfaces shall be finished in fine textured, scratch-resistant, powder coat paint
4. The EBDK enclosure shall provide discrete high and low voltage wiring compartments with voltage barrier.
5. EBDK dimensions and weights shall not exceed:
 - a. 10.5" H x 14" W x 4.2" D 11 lb.
6. Accessories
 - a. Emergency Bypass Detection Tap Kit (EBDK-TAP)
 - 1) The Emergency Bypass Detection Kit shall support an optional tap kit for normally power loss sensing within an ETC Unison DRd Enclosure

- 2) The Tap Kit shall provide fused over-current protection for sense feed wiring without the need for an external circuit breaker
- 3) The Tap Kit shall install within an ETC Unison DRd Enclosure

b. Emergency Bypass Restore Switch (EBDK-SWITCH)

- 1) The Emergency Bypass Detection Kit shall support an optional switch kit ,requiring manual override before allowing the EBDK to return to a normal power state
- 2) The Restore Switch shall be a single-gang device, fully finished, and supplied with mounting holes.
 - a) The EBDK Switch Kit shall be clearly labeled identifying intended operation
 - b) The Switch shall be labeled Lighting System Restore
 - c) The Switch shall include a red indicator that is illuminated when bypass operation is active
- 3) The EBDK Switch shall require two 16-gauge wires for connection to the Emergency Bypass Detection Kit
 - a) Up to two Bypass Restore Switches shall be supported per Emergency bypass Detection it

C. Electrical

1. Emergency Bypass Detection enclosures shall support 100 to 277 volt configurations
 - a. EBDK enclosures shall be field configurable for single-phase, bi-phase, and three-phase operation without the need for additional components.
2. Phase Loss Detection circuitry shall provide 0.5 second delay to prevent nuisance tripping
3. The EBDK shall provide an integrated circuit breaker for over-current protection and simulation of normal power loss
4. The Emergency bypass detection Kit shall support isolated outputs for connection to multiple dimming products simultaneously
 - a. Three isolated contacts shall be provided
 - b. Each contact shall support connection of up to four dimming products.
5. The Emergency Bypass Detection Kit shall be completely pre-wired by the manufacturer. The contractor shall provide input feed and control wiring.
6. All control wire connections shall be terminated via factory provided connectors.
 - a. Factory provided connector shall support 12 to 22-gauge wiring
 - b. Emergency lighting input shall support load shedding
7. The Bypass Detection Kit shall prove a normally-closed input for interface with fire alarm systems

8. The Bypass Detection Kit shall be UL and cUL Section 924 Listed for interaction with similarly listed dimming and switching panels

D. Thermal

1. Ambient room temperature: 0-40°C / 32-104°F
2. Ambient humidity: 10-90% non-condensing

2.15 DMX EMERGENCY BYPASS CONTROL

- A. Where required to trigger special-purpose lighting presets and bypass normal lighting controls during emergency or panic situations, the bypass means shall be the DMX Emergency Bypass Controller (DEBC) as manufactured by ETC, Inc., or equal

B. Functional

1. The DMX Emergency Bypass Controller shall be capable of overriding a single universe of ANSI E1.11–2008, USITT DMX512-A control signals from "Normal" to "Bypass" when a trigger signal is detected via a contact closure trigger input
 - a. The DMX Emergency Bypass Controller shall output to a single DMX output or up to six optically-isolated DMX outputs
 - b. The DMX Emergency Bypass Controller shall poll the bypass trigger input after a power loss and react upon start up
 - c. The default or recorded preset shall be recalled immediately on restart if the trigger is also applied at restart
 - d. Controllers that do not support E1.11–2008 compliant DMX communication shall not be acceptable
2. The DMX Emergency Bypass Controller shall be capable of recording a single DMX preset (snapshot) of 512 channels for recall during "Bypass" mode
3. The DMX Emergency Bypass Controller (DEBC) shall have internally accessible, labeled DIP switches for configuration of:
 - a. DMX Record Mode
 - 1) All 512 channels (default)
 - 2) Selected channels, snapshot
 - b. Contact input type
 - 1) Normally open (default)
 - 2) Normally closed
 - c. Wait Time for Restore incoming DMX (bypass trigger removed)
 - 1) 0 Seconds (default)
 - 2) 10 Second Wait
 - 3) 30 Second Wait

4) 10 Minute Wait

4. The DMX Emergency Bypass Controller shall support a single bypass input using two input modes:
 - a. Bypass triggering shall be supported via a maintained contact input configurable for normally open (N.O.) or normally closed (N.C.) operation
 - b. The contact input shall support +12VDC wet input to provide interface with fire alarm or secondary triggering systems. Bypass controllers that do not support a fire alarm input shall not be acceptable.

C. Mechanical

1. The DMX Emergency Bypass Controller (DEBC) enclosure shall be a surface mounted enclosure with a removable cover, constructed of 16-gauge, formed steel with a removable front cover
 - a. All components shall be properly treated and finished in fine textured, scratch-resistant, powder coat paint
 - b. DEBC enclosure shall have a minimum of four keyed mounting holes for wall attachment
2. DEBC enclosure shall have a visible label stating the product name, manufacturer name, indicator functions, control functions, ratings and listings
3. The DMX Emergency Bypass Controller (DEBC) enclosure shall provide discrete high and low voltage wiring compartments with voltage barrier
4. The DMX Emergency Bypass Controller (DEBC) shall have a single bi-color LED indicator visible from the exterior of the enclosure
 - a. LED shall indicate Normal state with a "green" color light
 - 1) Normal state illuminates steady green when Power and DMX are present
 - 2) LED Off indicates Power or DMX are not present
 - b. LED shall indicate Bypass state with a "red" color light
 - 1) Bypass state includes bypass input contact trigger or test' active
5. The DMX Emergency Bypass Controller (DEBC) shall have a single test button accessible from the front of the enclosure without removing any panels
 - a. The test button shall immediately trigger bypass state for as long as it is held down, and release the bypass state immediately upon release of the button
 - b. The test button shall be momentary only
 - c. The test button shall be recessed to prevent accidental triggering

D. The DMX Emergency Bypass Controller (DEBC) dimensions and weights shall not exceed:

1. 9" H x 11" W x 2" D,
2. 8lbs (single output); 14.5lbs (multi-output)

E. Electrical

1. The DMX Emergency Bypass Controller shall be completely internally pre-wired by the manufacturer
2. The contractor shall provide input feed and control wiring to the provided terminals
 - a. DMX Emergency Bypass Controllers (DEBC) shall support 100 to 277 volt input power, 50/60 Hz, 150mA maximum current
3. DEBC shall support labeled terminations for two 24 – 10 AWG solid or stranded power wires
4. DEBC shall support one Grounding Lug for 24-14 AWG solid or stranded ground wire
5. DEBC shall support labeled, socketed termination connections for DMX Input and DMX Output wiring
 - a. Terminations shall support Belden 9729 cable or equivalent
 - 1) DMX Termination kits for Belden 9729 shall be supplied with the controller
 - 2) Optional Termination kits for Belden 1583A (or equivalent Category 5 cable) shall be available from the manufacturer
6. DEBC shall support labeled, socketed termination for the bypass contact input
 - a. Termination shall support two, 30-12 AWG low-voltage wires
 - b. The bypass input shall support a maintained normally open (N.O.) or normally closed (N.C.) dry contact input
 - c. A +12VDC wet contact input shall also be available for interface to fire alarm systems.
 - d. DEBC shall support socketed DMX transceiver chips
 - 1) A spare DMX transceiver chip shall be supplied in a labeled, inactive socket
7. The DMX Emergency Bypass Controller (DEBC) shall internally switch from the normal DMX input (pass through) to the bypass DMX output using electromechanical relays when triggered
 - a. The DEBC shall have non-volatile memory for storage of a single recorded sequence of 512 channels
 - 1) The recorded sequence shall persist through power outages
 - 2) The default sequence shall have all 512 channels at "full" if no sequence is recorded
 - b. The DEBC shall have a DMX baud rate of "Slow" (20 packets per second) for increased compatibility during bypass DMX output
8. The DEBC shall be available in two versions capable of output to a single DMX line or up to six optically-isolated DMX lines
9. The DMX Emergency Bypass Controller shall be UL and cUL Section 924 LISTED for interaction with similarly listed products

F. Thermal

1. Ambient room temperature: 0-40°C / 32-104°F
2. Ambient humidity: 10-95% non-condensing

2.16 WALL MOUNT RELAY PANEL AND LOAD CENTER

A. General

1. The wall mount relay panel shall be the Echo Relay Panel as manufactured by ETC, Inc., or equal
2. Relay Panels shall be UL508, UL67, and UL924 Listed, and shall be so labeled when delivered
3. Relay Panels shall consist of a main enclosure with 30 pole breaker subpanel, relay/dimmer sub panel, integral control electronics, and a low voltage subpanel for data terminations and provision for accessory cards
 - a. Up to two accessory cards shall be supported per relay panel

B. Mechanical

1. The panel shall be constructed of 16-gauge steel. All panel components shall be properly treated and finished in fine-textured, scratch resistant paint
2. Relay panels shall be available in 120 and 277 Volt AC configurations
 - a. 120V enclosures shall be 67.5" high by 14.36" wide and 4" deep with a weight not more than 80 pounds
 - b. 277V enclosures shall be 67.5" high by 20" wide and 6" deep with a weight not more than 130 pounds
3. The panel shall be capable of being mounted on the surface of a wall or recessed mounted
 - a. 120VAC panels shall support mounting between standard wall stud framing (16-inch on center spacing)
4. Choice of panel covers shall be available for surface or recess mount applications. This outer panel shall ship complete with a locking door to limit access to electronics and breakers, breakers
 - a. Optional center-pin reject security screws shall be available for all accessible screws
 - b. Recess mount doors shall extend 1" beyond all panel edges to hide wall cut-out
5. The unit shall provide interior cover over breaker panel to allow access only to class 2 wiring and prevent direct access to class 1 line voltage components
6. The Relay panel shall support up to twenty-four 20-amp single pole circuits made up of relays or 300W dimmers

- a. Two and three-pole relay circuits shall be supported at decreased density where each pole constitutes one of the available single-pole circuits. Mixing of circuits in any combination shall be supported
 - b. Panels that do not support an integral dimmer module shall not be acceptable
7. Relays shall include integral switches for manual control while power is unavailable to the panel such that critical lighting can be set to an on state, without the need for power to the panel
 8. Relay output lugs shall accept 6-14AWG copper wire
 9. Breaker subpanel may include up to twenty-nine 20-amp single pole, up to fourteen 20 amp double pole, or nine three pole breakers as required in any combination up to capacity
 10. Control wiring for DMX, station bus, and Emergency input terminations shall land on removable headers for contractor installation.

C. User Interface

1. The user interface shall contain a graphical display with button pad to include 0-9 number entry, up, down back arrow navigation and enter
2. Test shortcut button shall be available for local activation of preset, sequence and set level overrides
3. The user interface shall have a power status LED indicator (Blue), a DMX status LED indicator (Green), a network status LED indicator (Green) and an LED indicator (red) for errors
4. Interface shall allow the backlight to timeout and shall provide user editable options to shut off backlight completely as well as adjust screen contrast
5. Ethernet interface shall default to automatic IP through link local and DHCP. Upon receiving IP address, the address of the Network Interface Card (NIC) shall display in the about menu. Static address and settings shall also be possible
6. The control interface shall support a USB memory stick interface for uploads of configurations and software updates

D. Functional

1. Panel setup shall be user programmable. The control interface shall provide the following relay setup features (per circuit):
 - a. Type (1 pole, 2 pole, or 3 pole)
 - b. Name
 - c. Circuit Number
 - d. DMX address
 - e. sACN address
 - f. Space Number
 - g. Circuit Mode
 - 1) Normal (priority and HTP based activation and dimming)
 - 2) Latch-lock
 - 3) Fluorescent
 - 4) DALI

- h. On threshold level
 - i. Off threshold level
 - j. Include in UL924 emergency activation
 - k. Allow Manual
2. Relay panels shall support discrete addressing of each relay. Panels that are restricted to use of start address with sequential addressing and cannot assign each 0-10V output control to any internal relay shall not be acceptable
3. The panel shall be capable of switching all relays on or off at once, or in a user-selectable delay per relay using a period of 0.1 to 60 seconds, in 0.1 second increments
4. An Ethernet connection shall provide advanced control of relays over streaming ACN (sACN) and transmit status, control override, and measured energy usage per branch circuit via an internal Web UI or central monitoring interface
- a. Control electronics shall report the following information per branch circuit
 - 1) Breaker state (On/Off)
 - 2) Breaker state (Open/Closed)
 - 3) Current draw (In Amps)
 - 4) Voltage
 - 5) Energy usage
 - b. Panels that do not report this information shall not be acceptable
5. Built-in Control shall include:
- a. Ability to record up to 16 presets in each space from the control panel, connected control stations, or timed events
 - b. Presets shall be programmable by recording current levels (as set by DMX or connected control stations), by entering levels on the control panel directly, manually selecting relay state on each relay or a combination of these methods. From the control panel, stations, or timed events it shall be possible to record values for up to 16 zones per space
 - c. Up to 8 spaces in a single rack for total of up to 16 spaces shall be supported per system or system subne
 - d. Indication of an active preset shall be visible on the control panel display
 - e. One 16-step sequence per space for power up and power down routines
 - f. The panel shall have a UL924-listed contact input for use in Emergency Lighting systems. The panel shall respond to the contact input by setting included relays to "on", while setting non-emergency relays "off". Each relay can be selected for activation upon contact input
 - g. Upon Data loss the system shall provide options to hold last look infinitely or hold for a configured time period set by the installing technician then fade/switch to the input of the next available priority
 - h. Control electronics shall respond directly to control stations for zone, preset, and sequence control. Systems that require secondary control systems for this functionality are not acceptable

- 2) Quick rack setup shall be available to apply address settings across all circuits for rack number, DMX Start Address, sACN universe, and sACN start address.
- 3) Emergency Setup Menu shall provide optional delays when emergency is activated or deactivated, and option to turn off non-emergency circuits shall be available. Record function shall allow circuits that are turned on to be added to the emergency setting

E. Electrical

1. Relay Panels shall be available to support power input from:
 - a. 120/208V three phase 4-wire plus ground
 - b. 120/240V single phase 3-wire plus ground
 - c. 277/480V, 230/400V and 240/415V three phase. 4-wire plus ground
2. Conduit Entry:
 - a. Feeders:
 - 1) Top or top-side (upper 6" of either side)
 - 2) Bottom or bottom-side 6" of either side
 - 3) Feeders shall enter through the top or bottom according to the orientation of the enclosure
 - 4) Feeder entry shall be nearest to the location of the feeder lugs or main breaker
 - b. Load:
 - 1) Load wiring shall enter through the top or bottom of the enclosure
 - 2) Load wiring shall enter through the top/bottom surface nearest to the breaker sub panel
 - 3) Load wiring may also enter through left and/or right side provided a low voltage chase is not required through the same area. If class 2 chase is required, a field installable barrier panel shall be provided upon request. When installed, the left or right side of the panel, where the barrier has been installed, shall not permit load wiring
 - c. Low Voltage:
 - 1) Top or top-side (upper 6" of either side)
 - 2) Bottom or bottom-side (bottom 6" of either side)
 - 3) For low voltage conduit entry at the relay end of the cabinet, conduits shall be located at the outer 3" of the top/bottom panel
 - 4) Field installed low voltage channel shall be provided separately for installation on the left or right side of the panel to allow class 2 wiring to traverse the panel from top to bottom or bottom to top
3. All relays shall be mechanically latching
4. The relay shall be capable of switching 20A at up to 300V

5. The relay panel shall support a maximum feed size of 200 Amps
6. Relay panels shall support main circuit breaker options:
 - a. Main breaker options shall be optional and available for purchase upon request
 - b. Main breakers shall be field installable
 - c. Main breakers shall be available in 100 and 200 Amps for 120V systems and 150 Amps for 277V systems
 - d. Series rated SCCR ratings apply as follows with appropriate main breaker:
 - 1) 22,000A at 120/240V
 - 2) 10,000A at 100A; 120/208V
 - 3) 10,000A, 22,000 or 42,000 at 200A; 120/208V
 - 4) 14,000A at 150A and 200A; 277V/480V
 - 5) 65,000A at 200A; 277V/480V
 - e. Main breakers shall allow the following range of wire sizes:
 - 1) 1AWG-300kcmil at 120/240V
 - 2) 3/0 to 300kcmil at 120/208V
 - 3) 6AWG-300kcmil at 277V/480V

F. Relay

1. Each relay shall have a manual override switch with on/off status indication
2. Relays shall be rated for use with:
 - a. 16A Electronic Ballast loads @ 120, 240 and 277V
 - b. 20A Tungsten loads at 120, 240, and 277V
 - c. 20A 277V Ballast (HID)
 - d. Motor loads with ratings of 20 FLA @ 120V, 17 FLA @ 240V, and 14 FLA @ 277V
100,000A symmetrical SCCR
3. Isolation shall be 4000V RMS
4. Relays shall be latching state
5. Rated Life:
 - a. 1,000,000 mechanical activations
 - b. 100,000 cycles at full resistive load
 - c. 30,000 cycles full motor, inductive, tungsten, and electronic (LED)
 - d. Decreasing loading shall increase the rated life of the relay inversely proportional the square of the load
6. Relays shall support reporting of current usage with an accuracy of five percent of the connected load

G. Dimmer Modules

1. Dimmer modules shall be available as either forward-phase or phase-adaptive
2. Dimmer modules shall be fully rated for loads up to 300W

3. By default, phase-adaptive dimmers shall automatically detect the required dimming mode based on connected loads and lock the mode in at power-up
4. The forward-phase dimmer shall support tungsten/incandescent, 2-wire fluorescent, and magnetic transformer loads
5. The phase-adaptive dimmer shall support tungsten/incandescent, line-drive LED, and electronic transformer loads
6. Panels without available dimmers that support magnetic loads shall not be acceptable
7. The panel shall support a maximum phase dimming load of 7,200W if populated fully with (24) 300W dimmer modules. Panels that do not support phase dimmers and relays combined in a single panel shall not be acceptable

H. Relay Panel Accessories

1. A low voltage 0-10V dimming option shall provide up to 24 0-10v control outputs that are linked to relay circuits within the panel. Each output shall support up to 400mA of current sink per output
2. A contact input option shall provide 24 dry contact inputs to be linked for direct or group relay control, to activate a preset, or to activate a sequence. Controller software shall allow for normally open maintained, normally closed maintained, or momentary toggle
3. A DALI control option shall provide 24 control loops of broadcast DALI control, with each loop controlling up to 64 DALI devices
4. A RideThru option shall provide short-term power backup of control electronics by automatically engaging when power is lost, and recharging when normal power is present
5. A tamperproof hardware kit shall be available that provides center reject Torx head screws to prevent access to panel interior by unqualified individuals

I. Main Breaker options shall be available as specified in Section E.6 Thermal

1. The panel shall be convection cooled. Panels that require the use of cooling fans shall not be acceptable
2. The panel shall operate safely in an environment having an ambient temperature between 32°F (0°C) and 104°F (40°C), and humidity between 5-95% non-condensing

2.17 POWER DISTRIBUTION – NEMA PLATES

A. General

1. NEMA connector plates shall be available in standard flush mount electrical back boxes from 1-gang up to 5 –gang in size
 - a. One outlet shall be provided per gang
2. Connectors shall be available as 20A grounded stage pin, 20A twist lock and 20A "U" ground (dual rated "T-slot"); other connectors shall be available as specified.
3. Terminations shall be made at each connector by the installer contractor.
 - a. 20 amp circuits shall use tension clamp terminals listed for 20 – 8 gauge wire.
 - b. Terminals that place a screw directly on the wire shall not be acceptable.

4. Connector plates shall mount to RACO #690, #691, #692, #693, #694 (or Equivalent) back boxes using supplied mounting hardware
 - a. The back boxes shall be provided by the contractor
 - b. Gang-able back boxes shall not be acceptable
5. NEMA connector plates shall be listed by a nationally recognized test lab (nrtl)

B. Physical

1. NEMA connector plates shall be fabricated using .125 aluminum and finished in black fine-texture powder coat paint.
 - a. Covers shall be fabricated from 16-gauge galvanized steel
2. Circuits shall be labeled on the connector strip with 9/16" lettering.
 - a. Circuit labeling options shall include:
 - 1) Circuits shall be labeled on the front side of the connector panel with white lettering on black background labels.
 - 2) Circuits shall be labeled on the front side of the connector panel with engraved lamicoid labels utilizing white lettering on black background labels.

2.18 POWER DISTRIBUTION – JUNCTION BOXES

A. General

1. Gridiron junction boxes shall be fabricated from 16-gauge cold rolled steel with 14 gauge end panels.
2. Junction boxes shall be finished with fine-textured, scratch-resistant, black powder coat.
 - a. Boxes for 30 circuits or less shall be 14"H x 14"W x 4"D
 - b. Boxes for 31 to 60 circuits shall be 14"H x 28"W x 4"D.
3. Junction boxes shall include mounting brackets and hardware
4. Cover(s) shall be 16-gauge cold rolled steel and hinge to allow installer to orient the hinged door to open in any horizontal direction.
5. Cover(s) shall be attached with machine screws and Tinnerman retainer nuts.

B. Electrical

1. Wiring terminations shall be made using feed through terminals individually labeled with corresponding circuit numbers.
 - a. 20 amp circuits shall use screwless tension clamp terminals listed for 20 – 8 gauge wire.
 - b. 50 amp circuits shall use compression terminals listed for 10 – 1 gauge wire.

- c. 100 amp circuits shall use compression terminals listed for 8 – 2/0 gauge wire.
 - d. Terminals that place a screw directly on the wire are not acceptable.
2. Gridiron junction boxes shall be listed by a nationally recognized test lab (nrtl).
3. A low voltage distribution system shall be available to incorporate DMX, Ethernet or other protocols as specified with the gridiron junction box.
 - a. Low voltage junction boxes shall attach to gridiron junction boxes to simplify wiring to a discrete device
 - b. Low voltage signals shall enter the junction box via a strain relief or connector mounted in a separate low voltage terminal box on the top or bottom of the gridiron junction box.
 - c. Up to four low voltage cables shall be supported for each junction box location.

2.19 POWER DISTRIBUTION – CONNECTOR STRIPS

A. General

1. Connectors shall be available as 20A, 50A and 100A grounded stage pin, 20A twist lock and 20A "U" ground (dual rated "T-slot"); other connectors shall be available as specified
2. Internal wiring shall be sized to circuit ampacity and shall be rated at 125°C
3. Pigtails shall be three-wire type "S" jacketed cable sized for the maximum circuit ampacity
4. Pigtails with 20 amp stage pin connectors shall be terminated using 12 gauge 4 way indent crimp (with inspection window) type where the wire is inserted and crimped directly in the socket
5. Terminations shall be at one end using feed-through terminals individually labeled with corresponding circuit numbers
 - a. 20 amp circuits shall use screwless tension clamp terminals listed for 20 – 8 gauge wire
 - b. 50 amp circuits shall use compression terminals listed for 10 – 1 gauge wire
 - c. 100 amp circuits shall use compression terminals listed for 8 – 2/0 gauge wire
 - d. Terminals that place a screw directly on the wire are not acceptable
6. Connector strips shall be supplied with appropriate brackets and hardware for mounting as shown on the drawings
 - a. Connector strips shall have junction brackets on 5' centers
 - b. Brackets shall be 1½" x .188" ASTM A36 steel
 - c. Hardware shall be ASTM A307 grade 5
7. A low voltage distribution system shall be available to incorporate DMX, Ethernet or other protocols as specified in the connector strip. Connector strips shall utilize a voltage barrier to accommodate these systems. Low Voltage signals shall enter the connector strip via a strain relief or connector mounted in a separate low voltage terminal box at the specified end of the connector strip. Up to four low voltage cables shall be supported for each connector strip

- a. Connector strips with multiple DMX outputs shall use active DMX/RDM pass through assemblies. Each strip shall support up to 24 active DMX/RDM pass through assemblies
 - b. DMX outputs without active splitting of the DMX/ RDM signal or that do not support RDM shall not be acceptable
8. Connector Strips shall be listed by a nationally recognized test lab (NRTL)

B. Physical

1. Connector strips shall be 6.25" H x 3.3" D and fabricated from 18-gauge galvanized steel and finished in black fine-texture powder coat paint
 - a. Covers shall be fabricated from 16-gauge galvanized steel
2. Connector strips shall be available in any length specified in increments of 6" and shipped fully wired with all splicing hardware
3. Pigtails and outlets shall be spaced on 18" centers or as otherwise specified
4. Outlets shall be mounted on individual 3" panels
5. No external terminal boxes shall be required for connector strips with 28 or fewer circuits unless otherwise specified
6. Circuits shall be labeled on the connector strip with 2" lettering
 - a. Circuit labeling options shall include
 - 1) Circuits shall be labeled on the front side of the connector strip with white lettering on black background labels
 - 2) Circuits shall be labeled on front and back sides of the connector strip with white lettering on black background labels
 - 3) Circuits shall be labeled on the front side of the connector strip with engraved lamacoid labels utilizing white lettering on black background labels
 - 4) Circuits shall be labeled on the front and rear sides of the connector strip with engraved lamacoid labels utilizing white lettering on black background labels
 - 5) Circuits shall be labeled on one side of the connector strip using individual circuit cover plates with lettering engraved in the cover and filled with the specified color
 - 6) Circuits shall be labeled using specified labeling per plans and drawings
7. Connector strips shall support optional LED indicators to indicate the presence of power at each local circuit. The indicator shall be red in color and mounted in the connector strip
 - a. The LED indicator shall be mounted in the lower right corner of the outlet panel
 - b. The LED indicator shall be mounted in the connector strip trough directly below the outlet panel
 - c. The LED indicator shall be mounted in the center of the 3" plate directly below the circuit label for pigtail circuits

C. Junction Boxes

1. Gridiron junction boxes shall be available to accommodate "S" type cable wiring into connector strips mounted to non-fixed locations
2. Junction Boxes shall be fabricated from 16-gauge cold rolled steel with 14 gauge end panels. They shall be finished with fine-textured, scratch-resistant, black powder coat paint. Cover(s) shall be 16-gauge cold rolled steel and hinged to allow mounting in any direction

2.20 POWER DISTRIBUTION – FLOOR POCKET

A. General

1. The floor pocket shall be a wiring device designed for flush mount installation into the floor.
2. Connectors shall be available as 20A grounded stage pin, 20A twist lock and 20A "U" ground (dual rated "T-slot"); other connectors shall be available as specified.
3. Terminations shall be made at each connector by the installer contractor.
 - a. 20 amp circuits shall use tension clamp terminals listed for 20 – 8 gauge wire.
 - b. Terminals that place a screw directly on the wire shall not be acceptable.
4. Floor pockets shall be supplied with back box and cover plate
5. The floor pocket back box shall have provisions for an integral voltage barrier for low voltage circuits.
6. Floor pockets shall be listed by a nationally recognized test lab (nrtl)

B. Physical

1. Floor pocket back boxes shall be 9"H x 13"W x 9"D and fabricated from 16-gauge cold rolled steel, finished in black fine-texture powder coat paint.
2. Floor pocket covers shall be constructed of 3/8" cast iron with a non-skid tread pattern utilizing a low-gloss black finish.
 - a. The cover shall be constructed with integral hinges and four (4) cable notches.
 - b. Covers are attached to the floor using four (4) mounting holes at the corners with hardware provided by the installing contractor
3. Floor pocket connectors shall be mounted in a connector panel fabricated of 16-gauge steel finished in a low gloss black powder coat paint
 - a. The connector plate shall be attached to the floor pocket cover.
4. Circuits shall be labeled on the connector strip with 9/16" lettering.
 - a. Circuit labeling options shall include:
 - 1) Circuits shall be labeled on the front side of the connector panel with white lettering on black background labels.

- 2) Circuits shall be labeled on the front side of the connector panel with engraved lamicoïd labels utilizing white lettering on black background labels.

2.21 POWER DISTRIBUTION – WALL POCKET

A. General

1. The wall pocket shall be a wiring device designed for flush mount installation into the wall.
2. Connectors shall be available as 20A grounded stage pin, 20A twist lock and 20A "U" ground (dual rated "T-slot"); other connectors shall be available as specified.
3. Terminations shall be made at each connector by the installer contractor.
 - a. 20 amp circuits shall use tension clamp terminals listed for 20 – 8-gauge wire.
 - b. Terminals that place a screw directly on the wire shall not be acceptable.
4. Wall pockets shall be supplied with back box and cover plate
5. The wall pocket back box shall have provisions for an integral voltage barrier for low voltage circuits.
6. Wall pockets shall be listed by a nationally recognized test lab (nrtl).

B. Physical

1. Wall pocket back boxes shall be 8"H x 12"W x 6"D fabricated from 16-gauge cold rolled steel and finished in black fine-texture powder coat paint.
2. Wall pocket covers shall be constructed of .16-gauge cold rolled steel and finished in black fine-texture powder coat paint.
 - a. The cover shall be constructed with integral hinges and four (4) or six (6) cable notches dependant on circuit quantity.
 - b. Covers shall be attached to the back box using four (4) mounting holes and included hardware
3. Wall pocket connectors shall be mounted in a connector panel fabricated of 16-gauge steel finished in a low gloss black powder coat paint
 - a. The connector plate shall be attached to the Wall Pocket back box.
4. Circuits shall be labeled on the connector strip with 9/16" lettering.
 - a. Circuit labeling options shall include:
 - 1) Circuits shall be labeled on the front side of the connector panel with white lettering on black background labels.
 - 2) Circuits shall be labeled on the front side of the connector panel with engraved lamicoïd labels utilizing white lettering on black background labels.

2.22 OCCUPANCY AND VACANCY SENSORS

A. Responsive Controls

1. Digital Ceiling Mount Occupancy/ Vacancy Sensors

- a. The Lighting Occupancy and Vacancy Sensors shall be the Unison Echo Responsive Controls Series as manufactured by ETC, Inc., or equal.
- b. Mechanical
 - 1) All sensors shall be constructed of ABS plastic and available in pure white or black
 - a) Manufacturer's standard colors shall conform to the RAL CLASSIC Standard.
 - 2) Sensors shall provide configuration buttons for enabling walk-test mode
 - 3) Sensors shall include customizable masks to block unwanted areas from view
 - a) Masks shall be field installable without the need to remove the sensor from the mounting bracket or to disassemble the sensor
 - 4) Sensors shall have no visible means of attachment
 - 5) Sensors shall include an adjustable mounting base that supports the following mounting options:
 - a) Mounting to any standard ceiling box
 - b) Mounting to any standard junction box
 - c) Mounting to single gang RACO box
 - d) Mounting to drywall or soft ceiling tiles using an included wire form adapter
 - 6) Sensors shall include all wiring connectors, and instructions.
 - 7) Sensors shall utilize multi-segment lens with internal slots to reduce buildup of dust.
 - 8) Sensors shall be available with three coverage options for:
 - a) Large room: 1800 sq. ft. at 8' ceiling, 3000 sq. ft. at 12' ceiling
 - b) Small room: 450 sq. ft. at 8' ceiling, 800 sq. ft. at 12' ceiling
 - c) High Ceiling: 350 sq. ft. at 10' ceiling, 7000 sq. ft. at 40' ceiling
- c. Electrical
 - 1) Sensors shall utilize Class 2, topology free control network
 - a) The control network shall utilize unshielded twisted pair, type Belden 8471 or equivalent, and one #14 ESD drain wire (when not installed in grounded metal conduit). Use of Category 5, or better, control network wiring shall also be supported.

- b) Network wiring may be bus, loop, home run, star or any combination of these.
 - c) Network termination connectors shall be provided with all sensors
- 2) Sensors shall be designed and tested to withstand discharges without impairment of performance when subjected to discharges of 15,000 volts per IEC 801-2.
 - 3) Sensors shall utilize LED illumination for status feedback of motion detection and for use during programming.
 - 4) Sensors shall be UL/ cUL LISTED and CE marked
- d. Functional
- 1) A single sensor shall be available for use as an occupancy or vacancy sensor
 - 2) Sensors shall meet ASHRE 90.1, CA Title 24 and NYC local law 48
 - 3) Sensors shall support a configurable sensitivity range.
 - 4) Provide 360-degree coverage range and include configurable masking.
 - 5) Sensors functions shall be self-programmed based on the presence of manual control station on the network.
 - a) Sensors shall only support auto-on functionality when no manual control stations are present.
 - 6) Sensors shall support a test mode that changes the unoccupied event (auto-off) timer to 5 seconds.
 - 7) Sensors shall only control loads located within the same space as the sensor.
 - 8) Sensors shall support walk-thru mode for simple testing of coverage
 - a) Illumination of sensor lens shall be used to indicate movement is detected, even with lens masks are installed.
 - b) Activation shall not require special tools or software
 - c) Provides 5 minute timeout to return to normal operation
 - 9) Sensors shall support a 30-second grace timer (retrigger) that automatically returns lighting loads to their previous state when motion is detected after a no occupancy (auto-off) event.
 - 10) Multiple sensors shall be supported within a single room or space without the need for additional configuration.

2.23 THEATRICAL LIGHT FIXTURES

A. General

- 1. Provide fixtures as indicated on the drawings and as specified in the Theatrical Light Fixture Schedule.

2.24 WIRE AND CABLE

- A. Building Wire in Raceways: Comply with requirements specified in Section 260519 "Low-Voltage Electrical Power Conductors and Cables."
- B. Portable Power Cable: Listed and labeled by an NRTL; flexible stage and lighting power cable; Type SC, SCE, or SCT; 600 V; multiconductor; 60 deg C temperature rating.
- C. Ethernet Cabling: Comply with requirements specified in Section 260523 "Control-Voltage Electrical Power Cables."
 - 1. For 10/100BaseT, comply with provisions for UTP cable and hardware.
 - 2. For 10Base-FL, comply with provisions for 62.5/125-micrometer, multimode, optical-fiber cable and hardware.
- D. ANSI E1.11 (USITT DMX512-A) Control Cabling: Comply with requirements specified in Section 260523 "Control-Voltage Electrical Power Cables."
 - 1. Standard Cable: NFPA 70, Type CM.
 - a. Paired, low-capacitance computer cable for ANSI E1.11 (USITT DMX512-A) applications. Two pairs, twisted, No. 22 AWG, stranded, tinned-copper conductors.
 - b. PE insulation.
 - c. Inner Shield: 100 percent coverage, aluminum foil-polyester tape.
 - d. Outer Shield: 90 percent coverage, tinned-copper braid.
 - e. Outer Shield Drain Wire: Stranded, tinned copper.
 - f. PVC jacket.
 - g. Flame Resistance: Comply with UL 1581.
- E. Control-Voltage Control Cabling:
 - 1. Control-Cable Conductors:
 - a. Class 1 Control Circuits: Stranded copper, Type THHN-THWN, in raceway; complying with UL 83.
 - b. Class 1 Control Circuits: Stranded copper, Type THHN, in raceway; complying with UL 44.
 - c. Class 2 Control Circuits: Stranded copper, Type THHN-THWN, in raceway; complying with UL 83.
 - d. Class 2 Control Circuits: Stranded copper, Type THHN, in raceway; complying with UL 44.
 - e. Class 3 Remote-Control and Signal Circuits: Stranded copper, Type TW or Type TF; complying with UL 83.
 - 2. Paired Cable: NFPA 70, Type CMG.
 - a. One pair, twisted, No. 16 AWG, stranded, tinned-copper conductors.
 - b. PVC insulation.
 - c. Unshielded.
 - d. PVC jacket.

- e. Flame Resistance: Comply with UL 1581.
3. Paired Cable: NFPA 70, Type CMG.
- a. One pair, twisted, No. 18 AWG, stranded (19x30), tinned-copper conductors.
 - b. PVC insulation.
 - c. Unshielded.
 - d. PVC jacket.
 - e. Flame Resistance: Comply with UL 1581.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Comply with NECA 1.
- B. Set permanently mounted items level, plumb, and square with ceilings and walls.
- C. Indicated mounting heights are to bottom of unit for suspended items and to center of unit for wall-mounted items.
- D. Mount and connect luminaires, and install and connect distribution devices.
 - 1. If arrangement is not indicated, install so each luminaire, dimmer, house lighting circuit, control channel, and outlet circuit can be operated, and complete system demonstrated, in all operating modes.
 - 2. Install safety cables secured to stage rigging or gridiron for all pipe-mounted electrical luminaires and equipment.
- E. Comply with mounting and anchoring requirements specified in Section 26 0072, "Electrical Supports and Seismic Restraints."

3.2 WIRING

- A. Power Wiring:
 - 1. Install wiring as specified in Section 26 0120, "Conductors and Cables" for hardwired connections. Install wiring in raceways except cable and plug connections. Install cable strain relief device on power and control cable drops.
 - 2. Install power wiring with a separate neutral for each output circuit from main dimmer and for each house and stage lighting circuit.
- B. Signaling, Remote-Control, and Power-Limited Circuits:
 - 1. Install wiring in raceways except cable and plug connections.

2. Comply with the following unless otherwise indicated:
 - a. Size conductors according to lighting control device manufacturer's written instructions.
 - b. Select cable insulation, shielding, drain wire, and jacket complying with lighting control device manufacturer's written instructions.
 - c. Install circuits to eliminate RFI and electromagnetic interference.
 3. Remote-control circuits associated with emergency lighting control shall be installed complying with Class 1 circuit standards in NFPA 70.
- C. Wiring within Enclosures: Bundle, lace, and train conductors to terminal points.
- D. Splices, Taps, and Terminations: Make connections only on numbered terminal strips in junction, pull, and outlet boxes and in terminal cabinets and equipment enclosures.
- E. Remove wall plates and protect devices and assemblies during painting.
- F. Support luminaires, distribution components, and accessories as specified in Section 260529 "Hangers and Supports for Electrical Systems." Equip all pipe-mounted equipment with safety cables that are secured to supporting pipe.
- G. Ground equipment according to Section 26 0452 "Grounding."

3.3 IDENTIFICATION

- A. Label each luminaire, lighting outlet, distribution device, and dimmer module with unique designation. Labels on elevated components shall be readable from the floor.

3.4 FIELD QUALITY CONTROL

- A. Manufacturer's Field Service: Engage a factory-authorized service representative to test, inspect, and adjust components, assemblies, and equipment installations, including connections.
- B. Perform the following tests and inspections with the assistance of a factory-authorized service representative:
1. Schedule visual and mechanical inspections and electrical tests with at least seven days' advance notice.
 2. Visual and Mechanical Tests and Inspections:
 - a. Inspect each luminaire, outlet, module, control, and device for defects, finish failure, corrosion, physical damage, labeling by an NRTL, and nameplate.
 - b. Exercise and perform operational tests on mechanical parts and operable devices according to manufacturer's written instructions.
 - c. Check tightness of electrical connections with torque wrench.
 - d. Verify proper protective device settings, fuse types, and ratings.

- e. Record results of tests and inspections.
3. Electrical Tests: Perform tests according to manufacturer's written instructions.
- a. Continuity tests of circuits.
 - b. Operational Tests: Connect each outlet to a luminaire and a dimmer output circuit, so each dimmer module, dimmer-control and output circuit, outlet, and luminaire in a typical operating mode will be sequentially tested. Set and operate controls to demonstrate luminaires, outlets, dimmers, and controls in a sequence that cues and reproduces actual operating functions for a typical system of the size and scope installed. Include operation and control of houselights and stage lights from each control location and station, including optional plug-in, control-console outlet locations. Record luminaire and outlet assignments, control settings, operations, cues, and observations of performance.
- C. Stage lighting will be considered defective if it does not pass tests and inspections.
- D. Prepare test and inspection reports.
- 1. Prepare a schedule of lighting outlets by number; indicate circuits, dimmers, connected luminaires, and control-channel assignments. Prepare a schedule of control settings and circuit assignments for house control channels. Prepare written reports of tests and observations. Report defective materials, workmanship, and unsatisfactory test results. Include records of repairs and adjustments made.

3.5 ADJUSTING

- A. Occupancy Adjustments: When requested within 12 months of date of Substantial Completion, provide on-site assistance in adjusting system to suit actual occupied conditions. Provide up to two visits to Project during other-than-normal occupancy hours for this purpose.
- B. Modify the software programming as required to comply with the Contract Documents.

3.6 SOFTWARE SERVICE AGREEMENT

- A. Technical Support: Beginning at Substantial Completion, service agreement shall include software support for two years.
- B. Upgrade Service: At Substantial Completion, update software to latest version. Install and program software upgrades that become available within two years from date of Substantial Completion. Upgrading software shall include operating system and new or revised licenses for using software.
 - 1. Upgrade Notice: At least 30 days to allow Owner to schedule and access the system and to upgrade computer equipment if necessary.

3.7 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's staff to adjust, operate, and maintain stage lighting equipment.
 - 1. Training shall be one four-hour session.
 - 2. Include costs associated with the training with the equipment installation.
 - 3. Provide a 14-day notice to Owner prior to scheduling training period.

END OF SECTION 11 5561

**SECTION 11 6143
STAGE CURTAINS**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Stage curtain fabrics.
- B. Linings.
- C. Scrim and drops.
- D. Stage curtain track support systems.
- E. Stage pipe grid and suspension system is work of this section. Unistrut support for lights, etc., is work of other sections.

1.02 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; 2023.
- B. FM (AG) - FM Approval Guide; Current Edition.
- C. ITS (DIR) - Directory of Listed Products; Current Edition.
- D. NFPA 701 - Standard Methods of Fire Tests for Flame Propagation of Textiles and Films; 2023, with Errata.
- E. UL (DIR) - Online Certifications Directory; Current Edition.

1.03 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide for each type of product as follows:
 - 1. Stage Curtains: Provide information on type of curtain, weight, location for use on project, and type of flame retardancy.
 - 2. Tracks: Provide capacity of each curtain track to support curtain weight and control curtain operation.
- C. Shop Drawings: Indicate installation information for components not dimensioned or detailed in product data.
 - 1. Submit floor plans, elevations, sections, attachment details of curtains and operating clearances.
 - 2. Submit fabric assembly and support details.
- D. Selection Samples: Submit color chart for each type of stage curtain indicated that includes full range of colors, textures, and patterns available, along with 12-inch square fabric sample, in any color, of each fabric type and seam.

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.
- B. Installer Qualifications: Company specializing in performing work of the type specified and with minimum three years of documented experience.

1.05 FIELD CONDITIONS

- A. Ambient Conditions: Do not install stage curtains until spaces are fully enclosed and watertight, and the following:
 - 1. Wet work in adjacent areas is complete and surfaces are dry.
 - 2. Work at and above ceiling level has been completed.
 - 3. Ambient temperatures and humidity of adjacent areas are maintained at levels when occupied for intended use.
- B. Field Measurements: Confirm supporting structural element locations and adjacent construction for stage curtains and rigging, and complete field measurements prior to

fabrication and include these dimensions on shop drawings.

1.06 WARRANTY

- A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
- B. Correct defective Work within a two year period after Date of Substantial Completion.
 - 1. Defective Work includes, but is not limited to, stage curtain support and rigging that is not operating properly.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Stage Curtain Fabrics:
 - 1. Beck Studios Inc; None - N/A: www.beckstudios.net/#sle.
 - 2. Fred Krieger & Company; None - N/A: www.fredkriegerfabrics.com/#sle.
 - 3. LuXout Stage Curtains; None - N/A: www.luxout.com/#sle.
 - 4. KM Fabrics None - N/A. www.kmfabrics.com
 - 5. Substitutions: See Section 01 6000 - Product Requirements.
- B. Stage Curtain Track Systems:
 - 1. Beck Studios Inc; None - N/A: www.beckstudios.net/#sle.
 - 2. Fred Krieger & Company; None - N/A: www.fredkriegerfabrics.com/#sle.
 - 3. LuXout Stage Curtains; None - N/A: www.luxout.com/#sle.
 - 4. Substitutions: See Section 01 6000 - Product Requirements.

2.02 PERFORMANCE REQUIREMENTS

- A. Stage Curtain Systems Design: Engage qualified designer to develop design of stage curtain system, including comprehensive project specific analysis of necessary structural system attachments in compliance with performance requirements.
- B. Structural Performance: Ensure attachment of stage curtain system to structure withstands material weight and operational loads applicable for this project and in compliance with local building codes and authorities having jurisdiction.
 - 1. Design Loads: Weight of stage curtains and track system.
- C. Fire-Test Characteristics: Stage curtain fabrics in compliance with NFPA 701 flame propagation fire test requirements conducted by authorized testing agency, listed by UL (DIR), ITS (DIR), or FM (AG) and acceptable to authorities having jurisdiction.
 - 1. Permanently attach label to fabric of each curtain assembly indicating fabric treatment as follows:
 - a. Inherently Flame Retardant (IFR), fibers/yarns that are non-combustible for life of fabric.

2.03 STAGE CURTAIN FABRICS

- A. Provide curtains of matching fabric and color from single dye lot, and when size and quantity of curtains exceeds maximum dye lot size, provide curtain or adjacent pair of curtains from only one dye lot, and arrange curtain dye lots to minimize exposure of any differences.
- B. Type A - Polyester Velour: Weighing at least 25 ounces/linear yard, napped fabric of 100 percent polyester with minimum pile height of 75 mils, 0.075 inch and minimum width of 62 inch.
 - 1. Application: Traveler curtains.
 - 2. Color: As selected by Architect from manufacturer's full range.
 - 3. Texture: As selected by Architect from manufacturer's full range.
 - 4. Pattern: As selected by Architect from manufacturer's full range.
 - 5. Products:
 - a. Fred Krieger & Company; IFR Epic Velour 25 oz: www.fredkriegerfabrics.com/#sle.
 - b. Substitutions: See Section 01 6000 - Product Requirements.
- C. Type F - Nassau Chevron - IFR Chevron 2000 Fabric: Weighing at least 15 ounces/linear yard, woven fabric of 100 percent cotton, with chevron weave and 54 inch minimum width.

1. Application: Cyclorama curtains and Borders, Biparting Traveler Panels, Legs..
2. Color: As selected by Architect from manufacturer's full range.
3. Texture: As selected by Architect from manufacturer's full range.
4. Pattern: As selected by Architect from manufacturer's full range.
5. Products:

2.04 LININGS

- A. Type LA - Light-Weight Polyester Lining at main traveler curtain: Weighing at least 10 ounces/linear yard, 100 percent polyester fabric; 72 inch minimum width.
 1. Color: Black.
 2. Products:
 - a. Fred Krieger & Company; IFR Poplin Cyc Cloth: www.fredkriegerfabrics.com/#sle.
 - b. Substitutions: See Section 01 6000 - Product Requirements.

2.05 SCRIMS AND DROPS

- A. Type SA - Scrim: Lightweight seamless gauze flat sewn fabric with an open weave.
 1. Application: Backdrop curtains.
 2. Color: As selected by Architect from manufacturer's full range.
 3. Continuous 6-inch high pipe pocket at bottom of curtain with 6-inch flap of matching fabric in front of pocket.
 4. 3-1/2-inch high double-stitched jute or laminated synthetic webbing at top of curtain with at least No. 2 brass grommets spaced at 12 inches on center and 1 inch from top corner of curtain.
 5. At least 2-inch wide double-folded side hem and 4-inch wide bottom hem.
 6. Fabric: Weighing at least 40 oz/linear yd, 100 percent polyester/modacrylic blend; 36-foot minimum width.
 7. Products:
 - a. Fred Krieger & Company; Fred Krieger FR Sharktooth Scrim: www.fredkriegerfabrics.com/#sle.
 - b. Substitutions: See Section 01 6000 - Product Requirements.
- B. Type DA - Drops: Flat sewn muslin fabric with horizontal or vertical seams and selvage located along edges to rear of curtain.
 1. Application: Backdrop curtain.
 2. Continuous 6-inch high pipe pocket at bottom of curtain with 6-inch flap of matching fabric in front of pocket.
 3. 3-1/2-inch high double-stitched jute or laminated synthetic webbing at top of curtain with at least No. 2 brass grommets spaced at 12 inches on center and 1 inch from top corner of curtain.
 4. At least 2-inch wide double-folded side hem and 4-inch wide bottom hem.
 5. Products:
 - a. Fred Krieger - Leno Gray.
 - b. Substitutions: See Section 01 6000 - Product Requirements.

2.06 METAL PIPE GRID

- 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. Support Chain: 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.

- F. Pipe layout to be 48 inches o.c, 40' wide / 24' deep; centered between back wall of proscenium and back wall of platform.
- G. To be installed at an elevation of 20'-0" above finished platform floor.

2.07 CURTAIN TRACK

- A. Steel Track: Commercial quality, roll-formed, galvanized steel sheet, ASTM A653/A653M, with G60 coating designation; with continuous bottom slot and each half of track in single continuous piece; black paint finish; including support and operation accessories.
 - 1. Thickness: As recommended by manufacturer for curtain loads and operation.
 - a. Heavy-Duty: 14 gage, 0.0747 inch minimum thickness at main draw curtain with full overlap.
 - b. Medium-Duty: 16 gage, 0.0598 inch minimum thickness at all other curtains. Each side leg track to be 8' length. Each side leg shall be mounted on 6' length batten with a pivot device to allow each side leg to slide to adjust the width of the stage area.
 - 2. Products:
 - a. Fred Krieger & Company; 100 Straight Track, Heavy-Duty or 350 Cyclorama Track, Medium-Duty: www.fredkriegerfabrics.com/#sle.
 - b. Substitutions: See Section 01 6000 - Product Requirements.
- B. Curtain Rails: Provide single or double curtain capacity as indicated on drawings, and end stops.
- C. Clamp and Bracket Hangers: Steel clamps and brackets of required strength to support loads for attaching track to overhead support.
- D. Track-Lap Clamp: Clamp that matches track channel finish as necessary for attaching two tracks at center overlap.
- E. Operation:
 - 1. Manual Walk-Along Operation: Curtain track without a cord, cable, pulleys, or floor pulley; must walk with curtain to open and close.
 - 2. Manual Cord Operation: Curtain track with cord, pulleys, and floor pulley; must manually open and close the main draw curtain.
 - a. Operating Line: 3/8-inch diameter, stretch-resistant operating cord with braided synthetic-fiber cover over solid, synthetic-fiber, linear filaments.
 - b. End Pulleys: One single dead-end and one double live-end pulley, with sheaves having shielded ball bearings housed in plated-steel covers that match track finish, and provide with bracket for securing off-stage end of curtain.
 - c. Floor Pulleys: Sheave, adjustable type with 3-inch (76 mm) diameter wheels, and having shielded ball bearings housed in plated-steel covers, painted black.
- F. Track System: Provide medium-duty curtain track with components as recommended by manufacturer for loads and operation, including track end stops.
 - 1. Carriers: Standard plated-steel carriers with a pair of nylon wheels riveted parallel to body, and equip carriers with and plated-steel swivel eye for attaching curtain snap or S-hook, and required number of curtain carriers for track length and curtain fabrication.
 - a. Master Curtain Carriers: One plated-steel master carrier for each leading curtain edge, with two pairs of nylon wheels and with two line clamps per carrier.
 - 2. Pulleys: One dead-end, single-wheel pulley; one live-end, double-wheel pulley; and one adjustable pulley to maintain proper tension on operating line; each with guarded ball-bearing sheaves enclosed in steel housings; pulleys with steel housing finished to match track and with bracket for securing off-stage end of curtain.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Examine areas and conditions, with installer present, for compliance with requirements for supporting structural members, blocking, clearances, installation tolerances, and other conditions that may impact performance of stage curtain assembly.

- B. Examine placement and condition of inserts, clips, blocking, or other supports installed by others and for use in supporting track and battens of stage curtain assembly.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION, GENERAL

- A. Install stage curtain assembly in accordance with curtain and track manufacturers written instructions.

3.03 INSTALLATION - CURTAIN

- A. Track Hung: Secure curtains to track carriers with S-hooks.
- B. Batten Hung: Secure curtains to pipe battens with S-hooks.

3.04 INSTALLATION - BATTENS

- A. Install battens by suspending at heights as indicated with trim and supports spaced as required to support loads; do not exceed 10 feet between supports.

3.05 INSTALLATION - TRACK

- A. Mounting of Track Assembly:
 - 1. Batten Mounted: Install track by suspending from pipe batten with manufacturer's acceptable track clamp hangers securely attached to batten pipe clamps and within intervals indicated in manufacturer's written instructions for on center spacing.
- B. Track Support Spacing: Comply with manufacturer's recommendations for applied loads, and not to exceed the following dimensions between track supports:
 - 1. Heavy-Duty Track: 6 feet, maximum.
 - 2. Medium-Duty Track: 4 feet, maximum.

3.06 CLOSEOUT ACTIVITIES

- A. See Section 01 7800 - Closeout Submittals, for closeout submittals.
- B. Demonstrate proper operation of equipment to Owner's designated representative.

3.07 PROTECTION

- A. Protect installed stage curtain assembly from subsequent construction operations until Date of Substantial Completion.

3.08 CURTAIN SCHEDULE

- A. Note: No Main Traveler Valance

Quantity	Description	Height	Width per Section	Fullness	Fabric	Lining
2 (Bi-parting)	Main Traveler Sections	16'-0"	21'-0"	60	A	LA
2 (Bi-parting)	Olio Traveler Sections - Black	20'-0"	21'-0"	60	F	-
1 (Fixed)	Olio Valance - Black	6'-0"	40'-0"	60	F	-
1	Olio Drop	20'-0"	36'-0"	50	DA	
1	Cyclorama Border	6'-0"	40'-0"	60	F	-
6 (3 ea side)	Cyclorama Legs	20'-0"	8'-0"	60	F	-
2 (Bi-parting)	Cyclorama Traveler Sections - Black	16'-0"	21'-0"	60	F	-
1	White Sharkstooth Scrim - White	20'-0"	36'-0"	0	SA	-
1	Cyclorama - Ice Blue	20'-0"	40'-0"	0	F	-

END OF SECTION 11 6143

**SECTION 11 6623
GYMNASIUM EQUIPMENT**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Basketball backboards, goals, and support framing.
- B. Floor anchors for tensioned elements.
- C. Floor sleeves for net and goal posts.
- D. Wall mounted protection pads.
- E. Volleyball nets and posts.

1.02 RELATED REQUIREMENTS

- A. Section 09 6466 - Wood Athletic Flooring: Gymnasium flooring.
- B. Section 26 0583 - Wiring Connections.

1.03 REFERENCE STANDARDS

- A. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2023d.
- B. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2020, with Errata (2023).
- C. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- D. NFPA 286 - Standard Methods of Fire Tests for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth; 2024.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. 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. 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 gauge of metal, hardware, and fittings; plan front elevation; elevations and dimensions; minimum one cross section; utility requirements as to types, sizes, and locations.
- D. Samples: Submit samples of wall pad coverings in manufacturer's available range of colors.

1.06 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years of documented experience.
- B. Installer Qualifications: Company specializing in performing work of the type specified with minimum ____ 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.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Gymnasium Equipment:
 - 1. Draper, Inc; None - N/A: www.draperinc.com/#sle.
 - 2. IPI by Bison, Inc; None - N/A: www.ipibybison.com/#sle.
 - 3. Performance Sports Systems; None - N/A: www.perfsports.com/#sle.
 - 4. Porter Athletic Equipment Company; None - N/A: www.porterathletic.com/#sle.
 - 5. Substitutions: See Section 01 6000 - Product Requirements.

2.02 GENERAL REQUIREMENTS

- A. See drawings for sizes and locations, unless noted otherwise.
- B. 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.

2.03 BASKETBALL

- A. Basketball System: Backstop assembly, backboard, and goal.
- B. Ceiling-Suspended Backstop Assemblies: Capable of mounting both rectangular and fan-shaped backboards.
 - 1. Framing: Center strut; forward folding framing.
 - 2. Folding Control System: Electric hoist that folds backstop with 115 volt actuator, integral limit switches that provide automatic shut-off in both positions, and safety catch with automatic reset.
 - 3. Framing Color: As selected from manufacturer's standard selection.
 - 4. Manufacturers:
 - a. Draper, Inc; EZ Fold Ceiling Suspended rear braced forward folding - Model TF-20J-B: www.draperinc.com/#sle.
 - b. Substitutions: See Section 01 6000 - Product Requirements.
- C. Backboards: Tempered glass, rectangular shaped.
 - 1. Frame: Brushed aluminum edge, steel mounting.
 - 2. Dimensions: 42 inches high by 72 inches wide
 - 3. Thickness: 1/2" inches.
 - 4. Markings: Integrally manufactured.
 - 5. Provide safety padding for bottom edge of backboard. Safety padding to be mechanically fastened to the backboard.
 - 6. Provide mounting kit.
 - 7. Color: Manufacturer's standard.
- D. Goals: Steel rim, mounted to backboard, with attached nylon net; complete with mounting hardware.
 - 1. Net Attachment Device: Tube-tie.
 - 2. Breakaway mechanism, adjustable.
 - 3. Provide safety pad for goal mounting.
 - 4. Finish: Powder coat orange.

2.04 FLOOR-MOUNTED EQUIPMENT

- A. Volley Ball Nets and Posts: One court systems of adjustable posts, net, and tensioning winch meeting requirements for FIVB, USA Volleyball, NCAA and NFHS competition requirements. Provide two each complete systems.
 - 1. Posts: 3-1/2 inch O.D. schedule 80 aluminum tube with 1 inch height adjustments between 42 and 96 inches.
 - 2. Net: 4 inch square #36 nylon cord with vinyl coated polyester hem, double stitched around the perimeter.
 - 3. Tensioning Winch: Manual crank heavy duty, self-locking worm gear mechanism.
 - 4. Antenna and boundary marker.
 - 5. Protective Pads: Polyethylene foam covered with polyester reinforced vinyl fabric.
 - 6. Volleyball Transporter: Heavy duty volleyball transporter cart on swivel casters.
 - 7. Manufacturers:
 - a. Draper, Inc; Power Volleyball System (PVS): www.draperinc.com/#sle.
 - b. Substitutions: See Section 01 6000 - Product Requirements.
- B. Floor Sleeves for Posts: Metal sleeve, with latch cover, cast into concrete subfloor to hold poles for nets and goals; installed flush with finish floor surface.
 - 1. Latch Cover: Brass, round.
 - 2. Sleeve: Aluminum.
 - 3. Round Pole Diameter: 3-1/2 inches.
 - 4. Depth of Sleeve: 9 inches from floor surface to bottom, including latch cover.

2.05 WALL PADDING

- A. Wall Padding: Foam filling bonded to backing board, wrapped in covering; each panel fabricated in one piece.
 - 1. Surface Burning Characteristics: Flame spread index (FSI) of 25 or less, smoke developed index (SDI) of 450 or less, Class A, when tested in accordance with ASTM E84 as a complete panel.
 - 2. Flammability: Comply with NFPA 286.
 - 3. Covering: Vinyl-coated polyester fabric, mildew and rot resistant; stapled to back of board.
 - a. Color: As selected from manufacturer's standard range.
 - b. Texture: Embossed leather-look.
 - c. Fabric Weight: 14 oz/sq yd, minimum.
 - 4. Foam, Fire-Rated: Open cell polychloroprene (Neoprene), with 5.5 pcf nominal density.
 - 5. Foam Thickness: 2 inches.
 - 6. Backing Board: Oriented strand board.
 - 7. Panel Dimensions: 24 inches wide by 72 inches long, including nailing margins.
 - 8. Fastening Margins: 1 inch wide, covered by fabric covering.
 - 9. Mounting: Permanent; using screws.
 - 10. Manufacturers:
 - a. Draper, Inc; EcoVision Wall Pad: www.draperinc.com/#sle.
 - b. 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, and notify Architect in writing of unsatisfactory or detrimental conditions.
- C. Do not proceed with this work until conditions have been corrected; commencing installation constitutes acceptance of work site conditions.
- D. Verify that electrical services are correctly located and have 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 equipment with manufacturer's recommended anchoring devices.
- E. Install wall padding securely, with edges tight to wall and without wrinkles in fabric covering.
- F. 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, and 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 as 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 Date of Substantial Completion.
- B. Replace damaged products before Date of Substantial Completion.

END OF SECTION 11 6623

**SECTION 11 6643
INTERIOR ELECTRONIC SCOREBOARD**

PART 1 - GENERAL

1.01 SUMMARY

- A. Section includes: Interior, electronic, multi-sport basketball scoreboards including control center, and other accessories for complete functional installation.

1.02 REFERENCES

- A. American Society for Testing and Materials (ASTM) Publications:
 - 1. ASTM B221 - Aluminum-Alloy Extruded Bar, Rod, Wire, Shape, and Tube.
 - 2. National Electrical Code.
 - 3. Federal Communications Commission, Part 15 Rules & Regulations.
 - 4. UL and C-UL Standard for Electric Signs

1.03 SUBMITTALS

- A. Provide in accordance with Section 01 33 00 - Submittal Procedures:
 - 1. To minimize the environmental impact of multiple paper copies, product installation prints, instructions and diagrams of manufacturer will be submitted in a paperless fashion. The end user shall receive all pertinent hard-copy documentation at delivery.
 - 2. Product data for scoreboards, controls, and accessories shall include descriptions of control functions etc.
 - 3. Installation drawings, face layout, dimensions, construction, electrical wiring diagrams, and method of anchorage. (Paperless when applicable).
 - 4. Copy of guarantee required by Paragraph 1.5 for review by Architect. (Paperless when applicable).
 - 5. Manufacturer's installation instructions. (Paperless when applicable).
 - 6. Finish Samples.

1.04 QUALITY ASSURANCE

- A. Source limitation: All components including scoreboard, control center, control cable, and other accessories and installation hardware shall be products of a single manufacturer.
- B. Manufacturer qualifications: Company specializing in manufacturing electronic scoreboards with 10 years minimum successful world-wide experience.
- C. Scoreboards and other electrical components shall be certified for use in United States and Canada by Underwriter Laboratories, (UL), Inc. and shall bear either UL or C-UL label only.
- D. Scoreboards and other electrical components shall be electrically grounded in accordance with National Electrical Code (NEC), Article 600.

1.05 GUARANTEE

- A. Provide under provisions of Section 01 78 00 - Closeout Submittals: Guarantee to cover defects in materials and workmanship.
 - 1. Scoreboards, scoring tables, marquees, message centers, video boards* and Stadium Pro loudspeaker enclosures are guaranteed for a period of five (5) years from the date of invoice against defects in workmanship or materials.
**Video Board exclusions include 8815, 8825, 8835, 8845.
 - 2. Wireless components, portable scoreboards and solar power kit carry a two (2) year guarantee from date of invoice. Hand-held controls and switches carry a one (1) year guarantee from date of invoice. The Stadium Pro loudspeaker front printed scrim is guaranteed for one (1) year from the date of invoice. Video Board Models 8815, 8825, 8835, and 8845 are guaranteed for one (1) year from date of invoice, unless additional years of warranty is purchased. For products supplied by third-party suppliers (i.e. cameras, computers, computer monitors, radar guns, loudspeakers, amplifiers and associated electronics), Purchaser agrees to accept the manufacturer's warranty, if any, in lieu of any warranty by Nevco.
 - 3. Lifetime telephone support.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

- A. Basis of Design: Nevco Inc, 301 East Harris Avenue, Greenville, Illinois 62246; 800-851-4040; www.nevco.com.
- B. Requests to use equivalent products of other manufacturers shall be submitted in accordance with Section 01 6000 - Product Requirements.

2.02 MATERIALS

- A. Aluminum face and perimeter frame: Fabricated from 0.050 inch minimum thickness, ASTM B221 aluminum sheet.
- B. Finish: Acrylic polyurethane paint. Color as selected by Architect from manufacturer's standard range.
- C. Electronics: Low voltage, solid state, 2-wire cable, multiplex system, quartz crystal controlled.
- D. Provide fiber optic communication interface to reduce threat of damage from electrical storms.
- E. LED (light emitting diode) units: Seven-bar, segmented digits in protective aluminum cover, rated typical life 100,000 hours, and designed to provide excellent visibility from all angles and sides.
- F. Provide location specific universal power cord with plug for world-wide installation.
- G. Junction boxes where required: Sheet metal box and cover, 4-1/2 x 2-1/8 x 2-1/8 inches min. complying with NEMA standards.

2.03 SCOREBOARDS

- A. Type: Interior, multi-purpose basketball/volleyball/wrestling electronic scoreboard with two integral horns, LED displays for time, scores, period, bonus, double bonus, and next possession arrows; Model 2702-NL (Non-Lit caption plates, base model) as manufactured by Nevco Inc. Rear-lit (RL) caption plates or Electronic Team Names (ETN) are optional and scoreboard shall be capable of in-the-field retrofit. Only LED lighting shall be used for rear-lit captions, incandescent lighting excluded. No captions shall be applied directly to the face of the scoreboard. All caption plates will be changeable and made of polyvinylchloride with vinyl lettering applied.
 - 1. Size: 10 feet long x 3 feet high x 8 inches deep.
 - 2. Approximate hanging weight: 80 pounds.
 - 3. Large black and white captions providing maximum visibility:
 - a. 6 inches high: "Home", "Guests", and "period".
 - 1) LED displays:
 - b. Timing: Super Bright Red or White 13 inches.
 - c. Team scores: Super Bright Amber or White 13 inches high digits.
 - d. Period: Super Bright Amber or White 9 inches high digits.
 - e. Next possession: Super Bright Amber or White arrow for each team.
 - f. Include bonus and double bonus in the form of a 4 inch Super Bright Red or White LED "B".
 - g. Rear-lit captions (when specified) shall require zero maintenance.
 - h. Provide Advertising /Team logo area 12" x 12" minimum.
 - 4. Suspension mounting attachments will be included.
 - 5. Power requirement: All options included: 126 Watts, MAX, 100-240 Volts AC w/Power Factor Correction.

2.04 ACCESSORIES/OPTIONS

- A. Provide each scoreboard or accessory with control cable of length required. Electrical junction boxes, conduits, mounting hardware, and other accessories as required for installation are to be provided by others.
- B. Electronic Team Names: "HOME" and "GUEST" caption plates to be replaced with programmable Electronic Team Names as manufactured by Nevco Inc.

1. Specify changeable team names as ETN. Shall not require controller upgrade, use of additional accessories, or computer.
 2. Specify (R)ed or (A)mber ETN LED's (Example: 27xx ETN-R)
- C. Provide for optional Team Name in place of "HOME" if NL/RL is selected.
- D. Additional accessories include but are not limited to; please specify quantity required.
- a. Nevco Inc. Shot Clocks / End of Period (EOP) system.

2.05 CONTROL CENTER

- A. Type: Wireless, microprocessor based, operator's control center with receiver unit mounted at scoreboard and designed to operate different models of scoreboard by interchange of keyboard overlay; Model MPCW as manufactured by Nevco Inc.. Console will operate earlier scoreboards from Nevco Inc..
1. Unit shall comply with Part 15 of FCC Rules regarding interference.
 2. Console: High impact, break-resistant gray plastic 11 x 9-1/2 x 4-1/8 inches [305 mm].
 3. Features:
 - a. Control can be used to operate both wireless and wired scoreboards.
 - b. Power on-off switch.
 - c. Split and raised 40 key keyboards, internal beeper acknowledging each entry, and bookmark capabilities.
 - d. Keyboard overlays for scoreboard or accessory.
 - e. Remote hand-held main time switch with integral horn button.
 - f. Provide with LED displays, lithium cell battery backup to maintain scoreboard memory and time of day, self test mode, power on-off switch, alternate time control, and multiple scoreboard operation.
 - g. Timer features: Time of day display, multiple time out timers with warning, interval horn, upcount auto stop with horn, and 1/10th second display during last minute.
 - h. Dimmer control for scoreboard.
 4. Receiver: Sturdy impact resistant construction, 6 x 4 x 1.5 inches with 4 inch [102 mm] antenna and mounted at scoreboard.
 5. Maximum range: 1,000 feet [305 m] from control center to receiver.
 6. Power adapters: Provide for each control center.
 - a. Input: 120 volts, 0.4 amps, 50/60 Hz.
 - b. Output: 9 volts, 1.67 amps, 15 watts.
 - c. Provide option of battery supply for control operation if utility power not available.
 7. Provide carrying case for control center and hand-held switch; Model CC-3 as manufactured by Nevco Inc.
 - a. Size: 18-1/2 x 14-1/2 x 6 inches.
 - b. Construction: Double wall, high density black polyethylene with padded interior, mechanical latches, and hinges.

PART 3 - EXECUTION

3.01 PREPARATION

- A. Verify exact scoreboard and control center quantities and junction box 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 installation 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 plumb with brackets and fasteners.
- D. Clean exposed surfaces.
- E. Protect scoreboards and finishes from other construction operations.

3.03 DEMONSTRATING AND TRAINING

- A. In accordance with Section 01 75 00 - Starting, Adjusting, and Demonstrating, provide demonstration and training session for Owner's representative covering operation and maintenance of electronic scoreboard.

END OF SECTION 11 6643

**SECTION 11 6823
EXTERIOR COURT ATHLETIC EQUIPMENT**

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes
 - 1. Basketball furnishings and equipment

1.02 SUBMITTALS

- A. Product Data: Manufacturer's data sheets on each product specified, including detailed installation diagrams and recommended installation methods.
- B. Selection Samples: For each product specified, two complete sets of chips representing manufacturer's full range of colors and finishes.
- C. Shop Drawings: Indicate all materials, dimensions, welds, finish, etc. for field fabricated items.
- D. Maintenance Data: For site furnishings to include in O&M Manuals.

1.03 QUALITY ASSURANCE

- A. Furnish paint for touch-up as required.
- B. Install pre-manufactured items, poured-in-place or pre-cast items, and all related materials required to complete the work indicated on the drawings and/or specified.
- C. Materials Inspection: The Contractor shall inspect all items upon delivery to ensure no damage to material or finish. Minor repairs and/or touch up shall be accepted only upon prior authorization from the landscape architect and shall conform, at minimum, to manufacturer's standards.

1.04 WARRANTY

- A. Contractor shall warrant work as provided by the General and Supplementary Conditions and Division 01 Specifications.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Basketball Post & Backboard: 5-9/16" diameter heavy duty gooseneck type galvanized pole with maximum 6' extension; steel powder coated fan backboard; heavy duty double ring goal.
- B. Installation per manufacturer's written installation procedures and details. Coordinate installation with poured-in-place concrete.

2.02 MANUFACTURER'S

- A. Douglas Sports, (800) 553.8907 or www.douglas-sports.com.
- B. ADP Lemco Inc., (801) 280.4000 or www.adplemco.com
- C. Component Playgrounds, (877) 985.2474 or www.componentplaygrounds.com
- D. Substitutions: See Section 01 6000 - Product Requirements.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Examine areas and conditions, with Installer present, for compliance with requirements for correct and level finished grade, mounting surfaces, installation tolerances, and other conditions affecting performance.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION

- A. Comply with manufacturer's written installation instructions unless more stringent requirements are indicated. Complete field assembly of site furnishings where required.

- B. Install furnishings and equipment level, plumb, true, securely anchored and positioned at locations indicated on Drawings.
- C. Post Setting: Set cast-in support posts in concrete footing with smooth top, shaped to shed water. Protect portion of posts above footing from concrete splatter. Verify that posts are set plumb or at correct angle and are aligned and at correct height and spacing. Hold posts in position during placement and finishing operations until concrete is sufficiently cured.
- D. Reinstallation of existing items shall include the use of all required new fasteners, footings, etc. to result in a fully functional system. Provide touch-up paint as required.

3.03 ADJUSTING

- A. Upon completion of the installation of site furnishings, check each item and verify that all equipment is properly installed; verify that all trim is in place; adjust all components as necessary to ensure proper operation; remove all labels from equipment.
- B. Make necessary adjustments for safe, efficient and smooth operation.

3.04 PROTECTION

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

3.05 CLEANING

- A. Remove all packing materials from job site.
- B. Clean or restore marred surfaces.

END OF SECTION 11 6823

**SECTION 11 6833
ATHLETIC FIELD EQUIPMENT**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. This work shall consist of furnishing all required labor, materials, equipment, and supplies for athletic field equipment.

1.02 RELATED REQUIREMENTS

- A. Section 01 7800 - Closeout Submittals: Project record documents, operation and maintenance (O&M) data, warranties and bonds.

1.03 SUBMITTALS

- A. See Section 013100 - Administrative Requirements, for submittal procedures.
- B. Product Data: For manufactured equipment, provide manufacturer's product data showing materials of construction, compliance with specified standards, installation procedures, safety limitations, and the number of users permitted.

1.04 QUALITY ASSURANCE

- A. Installation shall be done in accordance with the rules and guidelines established by the National Federation of State High School Associations and the American Sports Builders Association (ASBA).
- B. Install as specified by the manufacturer.
- C. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years of documented experience.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, handle, and store equipment to project site in accordance with manufacturer's recommendations.
- B. Store materials in a dry, covered area, elevated above grade.

1.06 WARRANTY

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

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Sports Field Specialties - Basis of Design
- B. Sports Edge, A Division of ABT, Inc. - Basis of Design
- C. Or pre-approved equal

2.02 MATERIALS

- A. Official Soccer Goal; aluminum, 8'H x 24'W x 10'D, round crossbar and uprights
 1. rear-mounted wheel kit
 2. white powder-coat finish
- B. Ball Safety System Netting; 20' tall, black powder-coat finish upright pole.

PART 3 EXECUTION

3.01 EQUIPMENT INSTALLATION

- A. Install in accordance with manufacturer's instructions.

END OF SECTION 11 6833

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**SECTION 12 2400
WINDOW SHADES**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Window shades and accessories.

1.02 RELATED REQUIREMENTS

- A. Section 06 1000 - Rough Carpentry: Concealed wood blocking for attachment of headrail brackets.
- B. Section 09 2116 - Gypsum Board Assemblies: Substrate for window shade systems.

1.03 REFERENCE STANDARDS

- A. NFPA 701 - Standard Methods of Fire Tests for Flame Propagation of Textiles and Films; 2023, with Errata.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Sequencing:
 - 1. Do not fabricate shades until field dimensions for each opening have been taken.
 - 2. Do not install shades until final surface finishes and painting are complete.

1.05 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide manufacturer's standard catalog pages and data sheets including materials, finishes, fabrication details, dimensions, profiles, mounting requirements, and accessories.
- C. Shop Drawings: Include shade schedule indicating size, location and keys to details.
- D. Selection Samples: Include fabric samples in full range of available colors and patterns.
- E. Verification Samples: Minimum size 6 inches square, representing actual materials, color and pattern.

1.06 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than five years of documented experience.
- B. Installer Qualifications: Company specializing in performing work of this type with minimum three years of documented experience.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Deliver shades in manufacturer's unopened packaging, labeled to identify each shade for each opening.
- B. Handle and store shades in accordance with manufacturer's recommendations.

1.08 FIELD CONDITIONS

1.09 WARRANTY

- A. Provide manufacturer's warranty from Date of Substantial Completion, covering the following:
 - 1. Shade Hardware: One year.
 - 2. Fabric: One year.
 - 3. Aluminum and Steel Coatings: One year.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Interior Manually Operated Roller Shades:
 - 1. Draper, Inc: www.draperinc.com/#sle.
 - 2. Lutron Electronics Co., Inc; None - N/A: www.lutron.com/#sle.
 - 3. Hunter Douglas Architectural: www.hunterdouglasarchitectural.com/#sle.

4. Levolor; None - N/A: www.levolor.com/commercial/#sle.
5. Mecho; Mecho/5: www.mechoshade.com.
6. Substitutions: See Section 01 6000 - Product Requirements.

2.02 WINDOW SHADE APPLICATIONS

- A. Interior Roller Shades at _____: Sheer shades.
 1. Type: Roll down, closed position is at window sill.
 2. Fabric: ThermalVeil Dense Vertical Weave with 2% Open.
 3. Color: As selected by Architect from manufacturer's full range of colors.
 4. Mounting: Inside (between jambs).
 5. Operation: Manual.

2.03 ROLLER SHADES

- A. Roller Shades: Fabric roller shades complete with mounting brackets, roller tubes, hembars, hardware and accessories.
 1. Drop: Regular roll.
 2. Size: As indicated on drawings.
- B. Fabric: Non-flammable, color-fast, impervious to heat and moisture, and able to retain its shape under normal operation.
 1. Flammability: Pass NFPA 701 large and small tests.
- C. Roller Tubes: As required for type of operation.
- D. Hembars: Designed for weight requirements and adaptation to uneven surfaces, to maintain bottom of shade straight and flat.
- E. Manual Operation for Interior Shades: Clutch operated continuous loop; beaded ball chain.

2.04 ACCESSORIES

- A. Fascias: Size as required to conceal shade mounting.
 1. Style: As selected by Architect from shade manufacturer's full selection.
 2. Material and Color: To match shade.
- B. Brackets and Mounting Hardware: As recommended by manufacturer for mounting configuration and span indicated.
- C. Fasteners: Non-corrosive, and as recommended by shade manufacturer.

2.05 FABRICATION

- A. Field measure finished openings prior to ordering or fabrication.
- B. Fabricate shades to fit openings within specified tolerances.
 1. Vertical Dimensions: Fill openings from head to sill with 1/2 inch space between bottom bar and window sill.
 2. Horizontal Dimensions - Inside Mounting: Provide symmetrical light gaps on both sides of shade not to exceed 3/4 inch total.
- C. Dimensional Tolerances: As recommended in writing by manufacturer.
- D. At openings requiring continuous multiple shade units with separate rollers, locate roller joints at window mullion centers; butt rollers end-to-end.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Examine finished openings for deficiencies that may preclude satisfactory installation.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
- C. Start of installation shall be considered acceptance of substrates.

3.02 PREPARATION

- A. Prepare surfaces using methods recommended by manufacturer for achieving best result for substrate under the project conditions.
- B. Coordinate with window installation and placement of concealed blocking to support shades.

3.03 INSTALLATION

- A. Install in accordance with manufacturer's instructions and approved shop drawings, using mounting devices as indicated.
- B. Installation Tolerances:
 - 1. Maximum Offset From Level: 1/16 inch.
- C. Adjust level, projection and shade centering from mounting bracket. Verify there is no telescoping of shade fabric. Ensure smooth shade operation.

3.04 CLEANING

- A. Clean soiled shades and exposed components as recommended by manufacturer.
- B. Replace shades that cannot be cleaned to "like new" condition.

3.05 PROTECTION

- A. Protect installed products from subsequent construction operations.
- B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION 12 2400

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**SECTION 12 3600
COUNTERTOPS**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Laminate Countertops
- B. Ultra-compact Surface Countertops
- C. Solid surface countertops

1.02 RELATED REQUIREMENTS

- A. Section 09 3000 - Tiling: Tile for countertops.

1.03 REFERENCE STANDARDS

- A. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2023d.
- B. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards, 2nd Edition; 2014, with Errata (2016).
- C. AWMAC/WI (NAAWS) - North American Architectural Woodwork Standards; 2021, with Errata.
- D. ISFA 2-01 - Classification and Standards for Solid Surfacing Material; 2013.
- E. NEMA LD 3 - High-Pressure Decorative Laminates; 2005.
- F. SEFA 2 - Installations; 2010.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
 - 1. Preparation instructions and recommendations.
 - 2. Storage and handling requirements and recommendations.
 - 3. Specimen warranty.
- C. Shop Drawings: Complete details of materials and installation ; combine with shop drawings of cabinets and casework specified in other sections.
- D. Test Reports: Chemical resistance testing, showing compliance with specified requirements.
- E. Maintenance Data: Manufacturer's instructions and recommendations for maintenance and repair of countertop surfaces.

1.05 QUALITY ASSURANCE

- A. Installer Qualifications: Company specializing in performing work of the type specified in this section, with not less than three years of documented experience.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's unopened packaging until ready for installation.
- B. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

1.07 FIELD CONDITIONS

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

PART 2 PRODUCTS

2.01 COUNTERTOPS

- A. Plastic Laminate Countertops: High-pressure decorative laminate (HPDL) sheet bonded to substrate.
 - 1. Laminate Sheet, Type ____: NEMA LD 3, Grade HGS, 0.048 inch nominal thickness.

- a. Manufacturers:
 - 1) Formica Corporation; _____: www.formica.com/#sle.
 - 2) Lamin-Art, Inc; _____: www.laminart.com/#sle.
 - 3) Panolam Industries International, Inc; _____: www.panolam.com/#sle.
 - 4) Wilsonart; _____: www.wilsonart.com/#sle.
 - 5) Substitutions: See Section 01 6000 - Product Requirements.
 - b. Surface Burning Characteristics: Flame spread index of 25, maximum; smoke developed index of 450, maximum; when tested in accordance with ASTM E84.
 - c. Wear Resistance: In addition to specified grade, comply with NEMA LD 3 High Wear Grade requirements for wear resistance.
 - d. Finish: As indicated on drawings..
 - e. Surface Color and Pattern: As indicated on drawings.
 - f. Location(s): As indicated on drawings.
2. Back and End Splashes: Same material, same construction.
- B. Ultracompact Surface Countertops: Sintered stone, chemically-resistant substrate.
1. Manufacturers:
 - a. Cosentino USA, Inc.; www.dekton.comSubstitutions: See Section 01 6000 - Product Requirements.
 - b. Substitutions: See Section 01 6000 - Product Requirements.
 2. Composition: Selected raw materials formed into flat slabs utilizing sinterized particle technology.
 3. Color: To be selected from manufacturer's full color range.
 4. Surface finish: As indicated on drawings.
 5. Surface Color and Pattern: As indicated on drawings.
 6. Slab Thickness: 3 cm
 7. Location(s): Science Classrooms and Science Lab Prep Rooms.
- C. Porcelain Slab Countertops: Gauged porcelain slabs bonded to substrate after installation of substrate on cabinet.
1. Large and Heavy Tile (LHT) Mortar: Materials and installation as specified in Section 09 3000.
- D. Solid Surfacing Countertops: Solid surfacing sheet or plastic resin casting over continuous substrate.
1. Flat Sheet Thickness: 1/2 inch, minimum.
 2. Solid Surfacing Sheet and Plastic Resin Castings: Complying with ISFA 2-01 and NEMA LD 3; acrylic or polyester resin, mineral filler, and pigments; homogenous, non-porous and capable of being worked and repaired using standard woodworking tools; no surface coating; color and pattern consistent throughout thickness.
 - a. Manufacturers:
 - 1) Avonite Surfaces; None - N/A: www.avonitesurfaces.com/#sle.
 - 2) Dupont; Natural Gray: www.corian.com/#sle.
 - 3) Formica Corporation; None - N/A: www.formica.com/#sle.
 - 4) Wilsonart; None - N/A: www.wilsonart.com/#sle.
 - 5) Substitutions: See Section 01 6000 - Product Requirements.
 - b. Surface Burning Characteristics: Flame spread index of 25, maximum; smoke developed index of 450, maximum; when tested in accordance with ASTM E84.
 - c. Finish on Exposed Surfaces: Semi-gloss, gloss rating of 25 to 50.
 - d. Color/Pattern Family: Solid color, light colors.
 3. Other Components Thickness: 1/2 inch, minimum.
 4. Exposed Edge Treatment: Built up to minimum 1-1/4 inch thick; radiused edge.
 5. Back and End Splashes: Same sheet material, square top; minimum 4 inches high.
 6. Fabricate in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), Section 11 - Countertops, Premium Grade.
 7. Location(s): As indicated on drawings.

2.02 ACCESSORIES

- A. Fixed Top-Mounted Countertop Support Brackets:
 - 1. Material: Steel.
 - 2. Finish: Manufacturer's standard, factory-applied, textured powder coat.
 - 3. Color: Black.
 - 4. Products:
 - a. Centerline Brackets; Front Mounting Plus Countertop Support: www.countertopbracket.com/#sle.
 - b. Substitutions: See Section 01 6000 - Product Requirements.

2.03 FABRICATION

- A. Fabricate tops and splashes in the largest sections practicable, with top surface of joints flush.
 - 1. Join lengths of tops using best method recommended by manufacturer.
 - 2. Fabricate to overhang fronts and ends of cabinets 1 inch except where top butts against cabinet or wall.
 - 3. Prepare all cutouts accurately to size; replace tops having improperly dimensioned or unnecessary cutouts or fixture holes.
- B. Provide back/end splash wherever counter edge abuts vertical surface unless otherwise indicated.
 - 1. Secure to countertop with concealed fasteners and with contact surfaces set in waterproof glue.
 - 2. Height: 4 inches, unless otherwise indicated.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
- C. Verify that wall surfaces have been finished and mechanical and electrical services and outlets are installed in proper locations.

3.02 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.03 INSTALLATION

- A. Install laboratory worksurface countertops in compliance with requirements of SEFA 2.
- B. Securely attach countertops to cabinets using concealed fasteners. Make flat surfaces level; shim where required.
- C. Attach plastic laminate countertops using screws with minimum penetration into substrate board of 5/8 inch.
- D. Tile and porcelain slab installation, see Section 09 3000.
- E. Seal joint between back/end splashes and vertical surfaces.

3.04 TOLERANCES

- A. Variation From Horizontal: 1/8 inch in 10 feet, maximum.
- B. Offset From Wall, Countertops: 1/8 inch maximum; 1/16 inch minimum.
- C. Field Joints: 1/8 inch wide, maximum.

3.05 CLEANING

- A. Clean countertop surfaces thoroughly.

3.06 PROTECTION

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

END OF SECTION 12 3600

**SECTION 12 6100
FIXED AUDIENCE SEATING**

PART 1 GENERAL

1.01 SUMMARY

- A. Work Included in this section: Provision of cushioned floor-mounted fixed swivel seats on swing arms including attachment, or other work required for installation unless otherwise noted.

1.02 RELATED SECTIONS

- A. Section 26 00 00: Electrical
- B. Floor-mounted anchors are included for installation on standard floor conditions.
- C. Data/Communications cabling and jacks not included.

1.03 SUBMITTALS

- A. Code Requirements - Compliance with the required local and national building and safety codes is the sole responsibility of the Owner/Architect/Contractor. Shop drawings are based on code requirements for assembly seating as found in IBC (International Building Code). Code information above is offered for informational purposes only and strictly as a courtesy to the Owner/Architect/Contractor. This is in no way an assumption of duty on the part of KI relative to code interpretation and compliance. KI personnel are not trained for, nor are they experts at code compliance or interpretation.
- B. Field Verification - Shop drawings incorporate building information compiled from various sources associated with this project and deemed as reliable. Conditions directly affecting the product, or its installation must be field verified.
- C. Drawing Review - Shop drawings are produced to assure compliance with the contract. Drawings must be reviewed by the Owner/Architect/Contractor, or other appropriate owner's representative. If drawings are correct, mark them as such; if incorrect, note corrections to be made and return to KI for corrections. Any deviations from the contract included in the shop drawing must be approved in writing from the Owner/Architect/Contractor. Drawing must be signed by authorized personnel including title, company or affiliation, and date. When power is specified, locations of electrical and data infeeds must be verified and approved by a signature on the drawings by the responsible party. Manufacture of product shown is not scheduled until drawing review is complete and an authorized signature is received.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Store delivered in clean, safe, dry area.

1.05 SCHEDULING

- A. Schedule installation of items to occur after application of exposed finishes wherever installation will not damage exposed finish surfaces and completion of finishes will not impede installation.

PART 2 PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

- A. Manufacturer: KI
 - 1. Product: University Seating
- B. Substitutions: See Section 01 6000 - Product Requirements.

2.02 DESCRIPTION

- A. Seating is floor-mounted with single or double swing arm bases to support seat shells and continuous worksurfaces. Seat shells swivel for ease in entry and exit and have an automatic memory return. Worksurfaces are continuous tops. An 8-wire, 4-circuit power distribution system is available to supply power and data to a PowerUp module with 3-prong plug or to an RPT module with 3-prong plug & RPT data bracket. Optional modesty panels are available. Sloped floors are accommodated.

2.03 CONSTRUCTION

- A. Floor-mounted steel frames which support solid core continuous worksurfaces with self-returning swivel seats and including but not limited to:
1. Worksurfaces are 1-1/4" thick, warp-resistant construction with a center core of 1-1/8" thick particleboard, a minimum of 47 pounds PCF density to prevent warping.
 2. K & V Tite Joint fasteners, hardwood spline, and steel splice plates are used to provide a virtual "seamless top".
 3. Edge options include 54B, 74P, 14S Wood and 34S Wood.
 4. Options are available for user spacing by utilizing different swing arms and bases. Standard 27" swing arm spacing, extended 30" swing arm spacing, Basic and Select style bases with or without 4A base extension spacing.
 5. Two base styles for a choice in aesthetics (Basic = Square; Select = Oval).
 6. Chair options allow a choice in comfort and price levels.
 7. Optional PowerUp modules with 3-prong plug provides surface-mounted power and data access for laptop users. The 8-wire harness of flexible conduit distributes power between the power/data modules and the 8-wire power infeed. The harness is enclosed in a plastic trough with a divider to separate power and communication or data cables.
 8. Optional RPT module with 3-prong plug & RPT data bracket provides two AC outlets and two data ports concealed in a plastic protective shroud and mounted underneath the surface between seats, opposite the base location. It utilizes the same 8-wire distribution system as PowerUp modules with 3-prong plug.
 9. Optional modesty panels are available in acrylic, laminate, steel or wood veneer.
 10. Powder-coat painted steel frames provide maximum durability.
 11. UL Classified for electrical hazards only.
 12. Fixed or height-adjustable seats. Height-adjustable seats are only available with Select style bases.

2.04 FRAMES (ARCHITECT TO SELECT EITHER BASIC OR SELECT)

- A. "Basic" rectangular bases are constructed of 14-gauge seam-welded tubular steel, 2" x 4" from floor plate to junction box, 2" x 2" from junction box to table mounting plate, welded into an integral unit to accommodate slope floors from 0-8 degrees. Table mounting plate at the top of the base is 11-gauge, 6" x 8" die-formed steel plate with two oval holes, 3/4" x 1-1/2", to allow for power and cable access and eight pierced holes to secure top to base with screws (furnished). Floor mounting flange is 11-gauge, 6" x 8" die-formed steel plate with 1/2" holes pierced in each corner for anchoring into floor. Base is secured to floor with four bolts for each base. Escutcheon covers constructed of molded plastic are supplied for each base and conceal anchor bolts. Designated power or data bases, as shown on the space plan, are specified with a 2" x 4" cutout on both sides of the base at the bottom to allow for power or communication/data cable access. Cutout comes with a metal cover painted to match the base. Swing-away seat is mounted at end of horizontal beam 1-1/2" x 2", 11-gauge, hinged at cantilevered frame junction box. Construction is of die-formed, heavy-gauge collar with polyacetal copolymer thermoplastic bearings at 8-gauge die-formed steel junction box. Spring-activated return is completely enclosed; all moving parts are protected by covers to prevent injury. Swing beam collar with bushings is anchored in junction box with 1/2" shoulder bolt and lock nut. Fixed-height seats swivel on 3/4" diameter post welded to seat spider and inserted into 1-3/4" tubular column welded to 1-1/2" x 2", 11-gauge horizontal beam. Nylon upper cams and PBT lower cams control rotation and memory return with spring tension. Slots in column allow adjustment of the seat in the field to parallel the edge of the worksurface. Swivel mechanism, upper and lower cams, spring and interior of seam column are lubricated for rotation. Basic style bases with 4A extension spacing are bases that are set back 4" from the back edge of the worksurface allowing for more user space. The Basic style base remains the same, only the tree (weldment arm between the base and worksurface) is extended and angled at 24 degrees to allow the additional 4" spacing.
- B. "Select" oval bases are constructed of 11-gauge seam-welded tubular steel, 1-1/2" x 2" from floor plate to junction box and 3.12" wide by 1.95" deep 2 mm oval tube from junction box to table mounting plate, welded into an integral unit to accommodate slope floors from 0-8

degrees. Table mounting plate at the top of the base is a 6" wide by x 8" deep 11-gauge die-formed steel plate with two oval holes measuring 3/4" x 1-1/2". These slots allow for power and cable access to the support. Eight pierced holes secure the base to the worksurface top with screws (furnished). Floor mounting flange is 6" wide by 8" deep 11-gauge, die-formed steel plate with 1/2" diameter holes pierced in each corner for anchoring to floor. Each base is secured to the floor with four bolts. All bases allow access for either power or data/communication cables. Routing of these wires can be up through the floor beneath the center of the base or through the front wall of the base unit's molded plastic enclosure. Spring-activated returns control the swing-away seat which is mounted at the end of a sloped and tapered oval tube with measurements ranging from 1-1/2" x 2-1/4" to 1" wide by 1-1/2" deep 14-gauge. Swing arm pivot tubes with molded bushings are anchored in junction box with high strength 1/2" diameter shoulder bolts secured by a locking hex nut. This entire pivot structure is enclosed by molded ABS covers including sliding plastic shields which cover all potential pinch points. Fixed-height seats swivel on 3/4" diameter post welded to seat spider and inserted into 1-3/4" diameter tubular column welded to the oval swing arm. Nylon upper cams and PBT lower cams control rotation and memory return with spring tension. Slots in column allow adjustment of the seat in the field to parallel the edge of the worksurface. Swivel mechanism, upper and lower cams, spring and interior of seam column are lubricated for rotation. Adjustable-height seats swivel on a pneumatic cylinder which, when unoccupied, self-returns to the highest forward position, maintaining consistent look throughout the room. Lever-controlled pneumatic height adjustment has infinite height selection within range. Select style bases with 4A extension spacing are bases that are set back 4" from the back edge of the worksurface allowing for more user space. The Select style base remains the same, only the tree (weldment arm between the base and worksurface) is extended and angled at 24 degrees to allow the additional 4" spacing.

2.05 WORKSURFACES - ARCHITECT TO SELECT

- A. Worksurfaces are nominal 1-1/4" thick, warp-resistant construction and have a center core of 1-1/8" thick particleboard, minimum of 47 lb PCF density. The top surface is a minimum of .040" thick high-pressure laminate meeting NEMA standards and the bottom surface, a balanced .040" thick phenolic backer. Laminate and backing sheet are permanently bonded to particleboard core using cross-linking poly vinyl acetate (PVA) adhesive under continuous pressure in a hot press. Continuous worksurface joints are secured with a minimum of two mechanical fasteners equal to Knape & Voight #516, hardwood spline and heavy-gauge steel plate under joint. Worksurfaces have cutouts to accept PowerUp modules when PowerUp is specified.
 1. Molded Edge Finishes:
 - a. 54B: 1-1/4" Vinyl Bullnose
 - b. 74P: 1-1/4" PVC Free
 - c. 14S: 1-1/4" Wood Bullnose with Square Corner
 - d. 34S: 1-1/4" Wood Band with Square Corner

2.06 MODESTY PANELS – ARCHITECT TO SELECT

- A. Acrylic modesty panels are constructed of Acrylite – Satinice, GP and a finish of DP9 frosted both sides. Bracket mounting holes for straight and formed (bent/wrap) end panels to be located per engineering and space-planning drawings. Also, when formed end panels are required, the acrylic panels are formed per the engineering and space-planning drawings. Acrylic modesty panels used with continuous worksurfaces are segmented with 1/2" space between panels.
- B. Laminate modesty panels are nominal .810" thick warp-resistant construction. Center core is 3/4" thick particleboard, minimum of 45 lb PCF density. The front surface is a minimum of .040" thick high-pressure laminate meeting NEMA standards and the back surface, .020" thick backing sheet.
 1. Laminate Edge Finishes:
 - a. 54B: 1-1/4" Vinyl Bullnose
 - b. 74P: 1-1/4" PVC Free
 - c. SE: Self Edge

- C. Perforated steel or dimpled steel modesty panels are constructed of 14-gauge steel with 3/4" hems on horizontal edges. Perforated steel panels have 1/4" holes on 3/4" spacing. Dimpled steel panels have
- D. .08" deep dimples recessed on 1-1/2" spacing. End panels will consist of wrap-around continuous panels, curved to follow the 90 degree corner.
- E. Perforated wood veneer modesty panels are .850" thick, warp-resistant construction. Center core is 3/4" thick particleboard, minimum of 45 lb PCF density. The front surface should be .080" thick veneer with black craft paper between core and veneer face. Backer sheet to be .020" thick.
- F. Polyester felt modesty panels are constructed from sound-absorbing, 100% polyester felt. The panels have a density of 0.5 lb/ft² and are sound absorbing tested to ASTM C423 with NRC rating of .44 when using no air gap (A-Mount testing method) and an NRC rating of .81 with 2" air gap. The polyester felt is in accordance with ASTM-E84 and achieve a Class A Flame Spread.
- G. NOTE: Natural wood and wood veneers may have variations in pattern, grain and coloring that can produce inconsistencies in the finished product, which may show up as dark patches or lines, color variations between light and dark, and various grain patterns. These variations are normal and cannot be avoided.

2.07 SEATING SHELLS - ARCHITECT TO SELECT

- A. Apply™
 - 1. One-piece contoured wood shell is constructed of formed plywood, .460"-.480" thick, 7-ply Maple and Poplar construction. The mold-formed seat and back provide for comfort and strength. Top/bottom and front/back surfaces are vertical grade postforming, product type 335, high-pressure laminate thickness of .028", standard finish is #38 or #60 with a sanded edge with tung oil finish. The wood shell is supported by four plywood circular disks and 1/4-20 t-nuts bonded with construction grade adhesive and fastened to an gauge steel seat spider with four 1/4-20 x 1/2" thread-locking screws. The chair perimeter is designed such that it provides a feature to support backpacks or tote bags. As an option, shells may be equipped with an upholstered seat pad. Urethane foam is attached to a formed poly upholstery liner, then upholstered using a drawstring process. The foam is a nominal 1/2" thickness. The pad assembly is attached to the shell using 10-24 screws, engaging the plastic bosses in the liner.
- B. Diem
 - 1. A weight-activated mechanism passively adjusts backrest tilt tension based on occupant weight. The mechanism is made of stamped steel with a black plastic trim cover. One lever operates the height-adjust cylinder and a second lever allows the backrest tilt mechanism to move freely or locks it in one of four positions. Plywood seat board with 3-1/2" thick molded urethane foam is upholstered using a drawstring method. Optional seat depth adjustment range of 2.5". Reinforced nylon frame backrest with mesh insert. Backrest frame and mesh are available in black, grey or white.
- C. Dōni™
 - 1. The backrest and seat are injection-molded polypropylene. The seat and backrest are joined by a pair of hidden articulation mechanisms, each consisting of a 14-gauge steel housing, twin 7-gauge levers and steel coil springs. While maintaining a one-piece shell appearance, this mechanism allows the backrest to recline up to 17 degrees of motion. Optional upholstered seat and back are available. Urethane foam is attached to an injection-molded polypropylene liner board, then upholstered using a draw-string process. Seat foam is molded nominal 1" thickness, and back foam is nominal 1/2" thickness. The flush-head fasteners that attach the back pad are color-matched to the polypropylene.
- D. Grazie®
 - 1. Seat and backrest are injection-molded polypropylene. The seat support structure is a die-drawn gauge steel plate. Fixed backrest mechanism structures are made from 1/2" diameter steel wire and attached by welding. Structure is finished with baked-on

electrostatically-applied 30-degree gloss epoxy powder-coat paint. Two outer backrest supports formed from 1" diameter tubular steel are inserted into sockets molded into the backrest and secured with screws. The backrest assembly moves over molded thermoplastic slide bushings and is supported by steel coil springs. This mechanism allows the backrest to move through 15 degrees of movement about an axis of rotation that is through the hips of the occupant. Optional upholstered seat and back pads consist of urethane foam attached to an injection-molded polypropylene liner board, then upholstered using a draw-string process. Seat foam is molded nominal 1" thickness, and back foam is nominal 1/2" thickness. The flush-head fasteners that attach the back pad are color matched to the polypropylene.

- E. Impress®
 - 1. Seat is constructed of 1/2" thick, saddle-shaped plywood with 2-1/2" thick molded, high-resilient foam and upholstered. The entire seat assembly is mounted to the mechanism by four screws. Stamped steel dual housing forms a sturdy cradle for the seat. The seat slider is double spring-loaded with a side-mounted easy-to-use control. The backrest is injection molded plastic board with embedded inserts for mounting. The board is covered with contoured molded foam and is upholstered. A textured black shroud covers the rear side.
- F. Impress® Ultra
 - 1. Seat is constructed of 1/2" thick, saddle-shaped plywood with 2-1/2" thick molded, high-resilient foam and is upholstered. The entire seat assembly is mounted to the mechanism by four screws. Stamped steel dual housing forms a sturdy cradle for the seat. The seat slider is double spring-loaded with a side-mounted easy-to-use control. The backrest is nylon with fiberglass-reinforced frame. Back mesh material is polyethylene elastomeric with polyester.
- G. Intellect Wave®
 - 1. One-piece contoured shell is constructed of high-impact polypropylene. Colorfastness is ensured through complete color impregnation throughout the molded part. Strength and durability are ensured through an engineered internal structural cavity which eliminates the need for unsightly ribs on the back of the shell. Rolled edges provide comfort and strength. Front and back are textured. Wide, ergonomic handle is molded into the chair back for ease of mobility. The shell fastens to the 12-gauge steel seat spider with six 1/4-20 x 5/8" screws. Intellect Wave is available with an upholstered seat or an upholstered seat and back. Upholstered chairs have partially exposed polypropylene surfaces. Fabric is upholstered over 9/16" foam on the back and seat and fasted to an inner shell with screws. Back upholstery covers handle.
- H. LimeLite™
 - 1. The seat and backrest are integrated into a single shell that is injection-molded in polypropylene, reinforced with glass fiber. The shell is ergonomically contoured and features a passive-flex back movement for superior comfort. The seat support structure is a die-drawn 12-gauge steel plate.
- I. Oath™
 - 1. Seat is constructed of a plywood seat board with dual-molded urethane foams which are upholstered using a drawstring method and finished with a black plastic under-shroud. Backrest is a reinforced black nylon frame with mesh insert. The seat mechanism is a self-weighting mechanism which passively adjusts backrest tilt tension based on occupant weight. The mechanism is made of stamped steel with a black plastic trim cover. One lever operates the height-adjust cylinder and a second lever allows the backrest tilt mechanism to move freely, or locks it in one of four positions.
- J. Strive®
 - 1. Seat is constructed of injection-molded polypropylene. An optional upholstered seat is also available, for which molded urethane foam is attached to an injection-molded polypropylene seat board then upholstered using a drawstring process. The assembled seat pad is attached to the seat by means of hidden fasteners. The backrest is injection-molded polypropylene with integral steel cantilever springs. The combination of the slotted

polypropylene back and spring steel provides a supportive flexing back. Springs are nominal 4-1/2 mm diameter chrome silicon valve spring wire. An optional upholstered back is available, constructed of 1/2" thick urethane foam attached to an injection-molded polypropylene back board, then upholstered using a draw-string process. The assembled back pad is attached to the back by means of fasteners which are exposed and color matched to the polypropylene.

K. Torsion®

1. Seats and backrests are molded compound curved polypropylene with a textured finish. Seat is two-piece construction. Upholstered chairs have partially exposed polypropylene surfaces. Fabric is upholstered over 9/16" foam on the backrest and 15/16" foam on the seat. Vinyl is available on the seat only. Two die cast aluminum backrest supports attach the backrest to the Torsion mechanism. A steel tube is cast into each backrest support for added strength. The back flex is achieved by the torsion mechanism. It consists of two flat torsion springs captured at both ends by brass bushings which in turn engage with the backrest supports. The torsion mechanism creates gradually increasing resistance over the full 12 degrees of back flex.

L. Torsion Air®

1. Seat is a two-piece construction with a molded polypropylene liner with a molded compound curved polypropylene shroud with a textured finish. Seat is always upholstered. Foam (1-1/2") is applied to the molded polypropylene liner. Fabric is then upholstered over the foam. Backrest frame is molded glass-reinforced nylon. Mesh fabric is 100% polyester. Two welded steel backrest supports attach the backrest to the torsion mechanism. The back flex is achieved by the torsion mechanism. It consists of two flat torsion springs captured at both ends by steel bushings that are welded to the backrest supports. The torsion mechanism creates gradually increasing resistance over the full 12 degrees of back flex.

2.08 POWER & DATA COMPONENTS (OPTIONAL) - ARCHITECT TO SELECT

A. PowerUp Module with 3-Prong Plug

1. The PowerUp Module with 3-prong plug is a UL listed relocatable power tap which is a surface mounted power module with a plastic cover. When open, two simplex power receptacles and two data jack openings are exposed. The module is 3-1/4" wide by 7" long and 2-1/4" tall when opened and fits securely into a 6-1/4" x 3" cutout, still allowing removal without tools. The module is constructed of polycarbonate with a textured finish, meeting UL 94 V-0 Flame Class minimum requirements. The module has two simplex receptacles, rated at 15 Amps/125 Volts and two locations for data connectors. Snap-in data plates hold data connectors and allow the standard module to accommodate most manufacturers. The data connectors are not supplied with the module and are purchased by the customer. The module has a dampened spring-loaded mechanism to allow the unit to open for use and close when not in use. The power receptacles open above the plane of the worksurface to avoid accidental spills into the receptacle. Data jacks remain stationary to avoid excess wear and tear on the wire connections and promote transmission of data communication. Data ports are molded to accept RJ45 jacks but can be modified to accept various brands of jacks. The module comes standard with a 22" cord and 3-prong plug that plugs into an 8-wire duplex receptacle on the 8-wire harness under the worksurface. Data jacks and wires are not included.

B. RPT Module with 3-Prong Plug & RPT Data Bracket

1. Optional RPT module includes two AC outlets per module and two data ports concealed in a plastic protective shroud and mounted underneath the worksurface between seats, opposite the base location. The shroud cover is made of PVC meeting UL 94-HB, 14" wide by 16-1/8" deep by 2-1/4" high, vacuum-formed to house the connection of the 8-wire harnesses. It utilizes the same 8-wire distribution system as PowerUp modules with 3-prong plug. Data jacks and wires are not included. A 3-prong plug is located at the opposite end of the 36" or 60" cord, which plugs into an 8-wire duplex receptacle on the 8-wire harness under the worksurface.

C. 8-Wire Span Connector

1. An 8-wire span connector of flexible conduit distributes power between the power & data modules and the 8-wire power infeed. The harness will be enclosed in a plastic trough with a divider to separate power and communication or data cables. The trough is constructed of rigid PVC approximately .06" thick. The trough is attached to the underside of the worksurface (by the installer) with wood screws provided. The trough measures 1.34" deep by 6.2" wide overall with an interior dimension of 5-1/2" cubic inches. The trough includes an L-shaped divider measuring 1-1/4" x 1-1/4" and is attached to a groove in the trough.
- D. Power & Data Shroud Cover
1. The power & data shroud cover is made of PVC meeting UL 94-HB, 12" wide by 14" deep by 2" high vacuum-formed to house the connection of the 8-wire harnesses and the cord from the PowerUp module with 3-prong plug. A 1-13/16" x 3" opening in the shroud allows access to the duplex receptacle. A 1-1/4" radiused slot allows access for removal of the PowerUp module with 3-prong plug.
- E. NOTE: All electrical components are installed on site with hardware provided. All PowerUp and RPT module components and University seating comprised of straight, truncated or radiused worksurfaces, straight modesty panels, and fixed bases and swing arm components are UL Classified for electrical hazards only. A licensed electrician is required to connect the 8-wire power infeed to the building power source.

2.09 FINISHES

- A. Frame Finishes – Baked-on electrostatically-applied powder-coat paint is standard on all frames. Standard KI fabrics available; C.O.M. (customer's own material) fabrics require factory approval. All finishes and colors to be selected by architect. Refer to KI Color Addendum for standard finishes. Custom colors and finishes available; contact factory.

2.10 COMPLIANCE

- A. "University Seating" is designed and manufactured in compliance with the intent of ANSI/BIFMA X5.4-2012. Seating exceeds all applicable BIFMA performance test criteria. Seating with Apply, Grazie, Intellect Wave, Torsion or Torsion Air shells are tested to 300-pound weight capacity. Electrical components of University seating (excluding curved modesty panels) are UL Classified for electrical hazards. University seating is SCS Indoor Air Quality certified.

PART 3 EXECUTION

3.01 PREPARATION

- A. Coordination details with other work supporting, adjoining, or otherwise contracting items as required to insure proper installation.
- B. Examine construction to verify that:
 1. Dimensions are correct to manufacturer's specifications.
- C. Do not install items until unsatisfactory conditions have been corrected.

3.02 INSTALLATION

- A. Install items in strict accordance to manufacturer's Assembly Instructions and approved Shop Drawings.

3.03 FLOOR MOUNTING REQUIREMENTS

- A. Minimum Floor Construction Required for Upright Installation
- B. Concrete Floors
 1. 3000 psi concrete compressive strength
 2. 3" thick free of obstructions for 1-1/2"
 3. 4" thick free of obstructions for 2-1/2" for riser mount
 4. Riser to be plumb within 1/8 degree
 5. Minimum anchor embedment 1-1/2"
- C. Wood Floors
 1. Minimum two layers of 3/4" thickness tongue & groove

2. APA rated grade plywood
 3. Allow minimum embedment 1-1/2" with lag screws
- D. Raised-Access Floors
1. Minimum rating of 125 PSF
 2. Must be installed with grade 3 or better 3/8" diameter bolt, washers and nuts
- E. NOTE: Warranty null and void if KI product is installed on flooring not meeting minimum structural requirements stated above. For non-typical floors not stated above, contact KI.
- F. Floor Fastener Requirements
- G. Concrete Floors
1. 1/4" x 2-5/8" Hilti KH-EZ
 2. Max. torque: 18 ft lb
 3. Four anchor assemblies required per base
- H. Wood Floors
1. 3/8" x 2-1/2" Hex washer head tapping screw
 2. Four screw assemblies required per base
- I. Raised Floors
1. 3/8-16 x 2-1/2" Grade 3 bolt (2-1/2" minimum length), 3/8" Grade 3 washer (quantity of 2), 3/8" Grade 3
 - a. lock washer, 3/8-16 Grade 3 nut
 2. Four bolt assemblies required per base

END OF SECTION 12 6100

**SECTION 12 6613
TELESCOPING BLEACHERS**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Telescoping bleachers.
- B. Electric motor operators, controls, and internal wiring.

1.02 RELATED REQUIREMENTS

- A. Section 26 0583 - Wiring Connections: Connection of electric motors and controls.

1.03 REFERENCE STANDARDS

- A. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.
- B. ASTM D635 - Standard Test Method for Rate of Burning and/or Extent and Time of Burning of Plastics in a Horizontal Position; 2022.
- C. ASTM D1929 - Standard Test Method for Determining Ignition Temperature of Plastics; 2023.
- D. ASTM D2843 - Standard Test Method for Density of Smoke from the Burning or Decomposition of Plastics; 2022.
- E. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2023d.
- F. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2020, with Errata (2023).
- G. AWS D1.3/D1.3M - Structural Welding Code - Sheet Steel; 2018, with Errata (2022).
- H. NFPA 102 - Standard for Grandstands, Folding and Telescopic Seating, Tents, and Membrane Structures; 2021.
- I. PS 1 - Structural Plywood; 2023.

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 handling and requirements.
 - 3. Installation methods.
- C. Shop Drawings: Complete layout with dimensions, seat heights, row spacing and rise, aisle widths and locations, points of connection to substrate, assembly dimensions, and material types and finishes.
 - 1. Provide drawings customized to this project.
 - 2. Include Professional Engineer certification.
 - 3. Wiring Diagrams: Show locations of motors, electrical wiring, and rough-in connections.
 - 4. 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. Operation and Maintenance Data: Manufacturer's operation and maintenance instructions, including annual inspection and maintenance and bi-annual inspection by a Professional Engineer or manufacturer factory service personnel.
- F. Warranty: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years of documented experience.
- B. Installer Qualifications: Manufacturer's installation crew.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Store, in original packaging, under cover and elevated above grade.

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. Replace parts that fail under normal use at no extra charge to Owner.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Telescoping Bleachers:
 - 1. Interkal LLC; None - N/A: www.interkal.com/#sle.
 - 2. Irwin Telescopic Seating Company; None - N/A: www.irwintelescopicseating.com/#sle.
 - 3. Hussey Seating Company; Maxam 26 Series: www.husseyseating.com.
 - 4. Substitutions: See Section 01 6000 - Product Requirements.

2.02 TELESCOPING BLEACHERS

- A. Telescoping Bleachers: Factory assembled tiered benches that retract horizontally into depth approximately the same as a single row depth, with fixed seats mounted on leading edge of platforms.
 - 1. 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.
 - 2. Design with solid fascia (riser) or seat fronts that conceal interior mechanisms when fully retracted, fitting tightly enough to prevent climbing up face; at front row provide key locked, hinged fascia (skirt) to cover gap between seat riser/fascia and floor.
 - 3. Standard Extension: Top row fixed to floor, adjacent to wall, forward extension (away from wall); attachment to wall acceptable.
 - 4. Wheelchair Spaces: Allow portions of first row, as indicated, to be manually retracted without affecting other rows; provide removable railings at row two behind wheelchair spaces in compliance with ADA Standards.
 - 5. Cutouts: Fit units to irregular wall surfaces, columns, pilasters, roof drain leaders, and other obstructions; take field measurements prior to fabrication.
 - 6. Operation: Motor operated.
- B. Design Loads: Design to withstand the following loading conditions:
 - 1. Live Load on Structural Supports: 100 psf, minimum, of gross horizontal projection.
 - 2. Live Load on Seats and Walking Surfaces: 120 pounds per linear foot.
 - 3. Lateral Sway Stress on Structural Supports: 24 pounds per linear foot of seat plank.
 - 4. Perpendicular Sway Stress on Structural Supports: 10 pounds per linear foot of seat plank.
- C. Dimensions:
 - 1. See drawings for overall dimensions.
 - 2. Gym
 - a. Rows: 11.
 - b. Rise Per Row: 9-5/8" inches.
 - c. Row Depth: 24 inches.
 - d. Seat Height Above Tread: 6 inches.
 - e. Closed Depth: Not more than 43 inches more than single row depth.
- D. Structural Supports: Steel or aluminum; manufacturer's standard wheeled carriages supporting each tier separately, with moving parts permanently lubricated and metal parts cushioned to prevent metal-to-metal contact during operation.
 - 1. Design so that each row carriage so that it will individually support the design loads and is self supporting when fully assembled without dependence on platform panels or boards, seats, or fascia.

2. Welding: In accordance with AWS D1.1/D1.1M and AWS D1.3/D1.3M.
 3. Bolting: Use lock-washers or locknuts.
 4. Wheels: Minimum 5 inch diameter by 1-1/8 inch wide, with non-marring rubber tires; ball, roller, or oil-impregnated metal bearings; minimum of 2 wheels at each floor support.
 5. Finish: Manufacturer's standard enamel or powder coating.
 6. Row Locking: Automatically mechanically lock each carriage to adjacent carriages when fully extended.
 7. Unlocking: Automatically unlock all rows before engaging retraction mechanism.
- E. Motor Operation: Manufacturer's standard drive mechanism, using motor adequately sized for the purpose.
1. Provide UL listed electrical components and wiring.
 2. Controls: Start, Stop, Forward, and Reverse in a single control unit.
 3. Control Station: Removable plug-in low-voltage pendant station, with first-row plug-in location for each motor.
 4. Limit Switches: Automatically stop operation when unit has reached fully open or fully closed position.
 5. Provide all wiring internal to bleacher units, to junction box located where indicated; ensure that wiring is not energized except during operation.
 6. Electrical Characteristics: 208/230V, 5 wire, 3-phase, 60 Hz.
 7. Provide access to motor from front side of bleachers; a hinged front skirt or hinged section at least 30 inches wide is acceptable.

2.03 SEAT AND PLATFORM COMPONENTS

- A. Seat/Fascia Assembly: Continuous, molded UV-stabilized high-density polyethylene plastic, seat minimum 1 inch thick, textured finish, homogeneous color throughout, color as selected from manufacturer's standard selection; allow for two colors, approximately 18 inch long sections independently removable with tongue-and-groove or rabbeted interlock at end joints.
1. Shape: Ergonomically contoured, with internal ribs spaced for natural flexibility; rear edge cantilevered to provide toe room of not less than 3 inches; no openings to trap debris.
 2. Fire Retardance: Self-ignition temperature of 650 degrees F or greater when tested in accordance with ASTM D1929; smoke developed index of 450 or less, when tested in accordance with ASTM E84, or 75 or less when tested in thickness intended for use in accordance with ASTM D2843; and burning extent of [CHOICE TEXT] or less when tested in thickness intended for use in accordance with ASTM D635.
 3. Provide end caps of same material and finish on each exposed end.
 4. Supports: Internal steel reinforcement of each seat segment bolted to platform nose member; minimum two bolts per segment.
 5. Seat and Row Numbers: Provide recessed pockets and number plates.
- B. Platform, Tread, and Step Structure: Plywood continuously supported on front and rear with side joints tongue-and-grooved.
1. Plywood: PS 1, 5-ply southern pine or polyethylene-overlaid douglas fir or southern pine, Grade A-C.
 2. Plywood Thickness: 5/8 inch, minimum.
 3. Front (Nose), Rear, and Intermediate Supports: Steel channel or tube, hot-dipped galvanized.
 4. Provide end caps of same material and finish on each exposed end.
 5. Finish: High gloss clear urethane, both sides, unless polyethylene finished.
 6. Nosings: Extruded aluminum; clear anodized finish.
 7. At aisles provide permanently attached intermediate steps of same construction and finish.
 8. At bottom of aisles provide step in front of first riser, hinged to first platform to fold for storage.

2.04 HANDRAILS AND RAILINGS

- A. Provide the following railings:

1. Aisle Handrails: Single post folding railing segment mounted in center of aisle at every other row beginning at row 2.
 2. End of Row Guardrails: Self-storing, at open ends of sections beginning at row 2.
 3. Height: 42 inches above adjacent platform or tread.
- B. Design handrails and railings to withstand the following loads:
1. Concentrated Load on Handrails: 200 pounds in any direction.
 2. Concentrated Load on Guardrails: 200 pounds in any direction along top rail.
 3. Live Load on Handrails: 50 pounds per linear foot, applied in any direction.
 4. Live Load on Guardrails:
 - a. Horizontal: 50 pounds per linear foot, applied at the guardrail height.
 - b. Vertical: 100 pounds per linear foot, applied vertically to top of guardrail.
- C. Railing Construction: Round steel or aluminum pipe or tube, with formed elbows at corners and caps at ends of straight runs.
1. Aluminum: 1.66 inches minimum outside diameter; natural anodized finish.
 2. Infill: Vertical steel tubular members at 4" spacing, 3/4" x 3/4" x 1/16" Sq. ERW tube.

2.05 ACCESSORIES

- A. Fillers and Closures:
1. Ends of Retracted Units: Plywood panels, finished to match platforms.
 2. Top Row: Provide seat level rear filler panels to close openings between top row seat and wall; finish to match platforms.
 3. Sides of Extended Units: Vinyl curtains.
 4. Vinyl Curtains: 18 ounce vinyl with grommets; color as selected from manufacturer's standard palette.
- B. Scorer's Table: 8 feet wide by 15 inches deep; relocatable to any row of any section without mounting brackets.
- C. Fasteners: Provide hardware and fasteners in accordance with manufacturer's recommendations.
- D. Anchorage: As indicated on drawings; provide hardware in accordance with manufacturer's recommendations.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that field measurements are consistent with those on the shop drawings.
- B. Verify that electrical rough-ins have been installed and are accessible.
- C. Do not begin installation until substrates have been properly prepared and area has been cleared of obstructions.
- D. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.02 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.03 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Do not field cut or alter seats, fascia, or structural members without approval.
- C. Provide manufacturer's field representative to inspect completed installation.

3.04 ADJUSTING

- A. Lubricate, test, and adjust each moving assembly to ensure proper operation in compliance with manufacturer's recommendations.

3.05 CLEANING

- A. Clean exposed and semi-exposed assembly surfaces.
- B. Touch up finishes on damaged or soiled areas.

3.06 CLOSEOUT ACTIVITIES

- A. Demonstration and Training: Provide manufacturer's field representative to demonstrate to and train Owner's operating personnel in proper operation of equipment.
 - 1. Location: On site using installed equipment.
 - 2. Time: As agreed between Owner and CMGC Contractor .

3.07 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

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**SECTION 12 6614
TELESCOPING BENCHES**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Telescoping benches.
- B. Electric motor operators, controls, and internal wiring.

1.02 RELATED REQUIREMENTS

- A. Section 26 0583 - Wiring Connections: Connection of electric motors and controls.

1.03 REFERENCE STANDARDS

- A. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.
- B. NFPA 102 - Standard for Grandstands, Folding and Telescopic Seating, Tents, and Membrane Structures; 2021.
- C. PS 1 - Structural Plywood; 2023.
- D. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2020, with Errata (2023).
- E. AWS D1.3/D1.3M - Structural Welding Code - Sheet Steel; 2018, with Errata (2022).

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 handling and requirements.
 - 3. Installation methods.
- C. Shop Drawings: Complete layout with dimensions, seat heights, row spacing and rise, aisle widths and locations, points of connection to substrate, assembly dimensions, and material types and finishes.
 - 1. Provide drawings customized to this project.
 - 2. Include Professional Engineer certification.
 - 3. Wiring Diagrams: Show locations of motors, electrical wiring, and rough-in connections.
- D. Selection Samples: For each material for which color selection is required, submit samples, 2 by 2 inches in size, illustrating colors and finishes available.
- E. Operation and Maintenance Data: Manufacturer's operation and maintenance instructions, including annual inspection and maintenance and bi-annual inspection by a Professional Engineer or manufacturer factory service personnel.
- F. Warranty: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years of documented experience.
- B. Installer Qualifications: Manufacturer's installation crew.
- C. Welder Qualifications: Certified by AWS for the process employed.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Store, in original packaging, under cover and elevated above grade.

1.07 WARRANTY

- A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
- B. Correct defective Work within a five year period after Date of Substantial Completion. Replace parts that fail under normal use at no extra charge to Owner.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Telescoping Bleachers:
 - 1. Hussey Seating Company; Maxam Seatway - Club Bench: www.husseyseating.com.
 - 2. Substitutions: See Section 01 6000 - Product Requirements.

2.02 TELESCOPING BLEACHERS

- A. Telescoping Bleachers: Factory assembled tiered benches that retract horizontally into depth approximately the same as a single row depth, with fixed seats mounted on leading edge of platforms.
 - 1. 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.
 - 2. Design with solid fascia (riser) or seat fronts that conceal interior mechanisms when fully retracted, fitting tightly enough to prevent climbing up face; at front row provide key locked, hinged fascia (skirt) to cover gap between seat riser/fascia and floor.
 - 3. Standard Extension: Top row fixed to floor, adjacent to wall, forward extension (away from wall); attachment to wall acceptable.
 - 4. Configurations: As indicated on Contract Drawings.
 - 5. Wheelchair Spaces: Allow portions of first row, as indicated, to be manually retracted without affecting other rows; provide removable railings at row two behind wheelchair spaces in compliance with ADA Standards.
 - 6. Cutouts: Fit units to irregular wall surfaces, columns, pilasters, roof drain leaders, and other obstructions; take field measurements prior to fabrication.
 - 7. Operation: Motor operated.
- B. Design Loads: Design to withstand the following loading conditions:
 - 1. Live Load on Structural Supports: 100 psf, minimum, of gross horizontal projection.
 - 2. Live Load on Seats and Walking Surfaces: 120 pounds per linear foot.
 - 3. Lateral Sway Stress on Structural Supports: 24 pounds per linear foot of seat plank.
 - 4. Perpendicular Sway Stress on Structural Supports: 10 pounds per linear foot of seat plank.
- C. Dimensions:
 - 1. See Contract Drawings for overall dimensions.
 - 2. Multi-Purpose
 - a. Rows: 14.
 - b. Rise Per Row: 9-5/8" inches.
 - c. Row Depth: 36 inches.
 - d. Seat Height Above Tread: 6 inches.
 - e. Closed Depth: Not more than 59 inches more than single row depth.
- D. Structural Supports: Steel or aluminum; manufacturer's standard wheeled carriages supporting each tier separately, with moving parts permanently lubricated and metal parts cushioned to prevent metal-to-metal contact during operation.
 - 1. Design so that each row carriage so that it will individually support the design loads and is self supporting when fully assembled without dependence on platform panels or boards, seats, or fascia.
 - 2. Welding: In accordance with AWS D1.1/D1.1M and AWS D1.3/D1.3M.
 - 3. Bolting: Use lock-washers or locknuts.
 - 4. Wheels: Minimum 5 inch diameter by 1-1/2 inch wide, with non-marring rubber tires; ball, roller, or oil-impregnated metal bearings; minimum of 2 wheels at each floor support.
 - 5. Finish: Manufacturer's standard enamel or powder coating.
 - 6. Row Locking: Automatically mechanically lock each carriage to adjacent carriages when fully extended.
 - 7. Unlocking: Automatically unlock all rows before engaging retraction mechanism.

- E. Motor Operation: Manufacturer's standard drive mechanism, using motor adequately sized for the purpose.
 - 1. Provide UL listed electrical components and wiring.
 - 2. Controls: Start, Stop, Forward, and Reverse in a single wall mounted control unit.
 - 3. Control Station: Removable plug-in low-voltage pendant station, with first-row plug-in location for each motor.
 - 4. Limit Switches: Automatically stop operation when unit has reached fully open or fully closed position.
 - 5. Provide all wiring internal to bleacher units, to junction box located where indicated; ensure that wiring is not energized except during operation.
 - 6. Electrical Characteristics: Motor 3 ph, 240 v, 60 hz, 0.5 Hp, 1.25 SF, 1425 rpm, with a control panel 120V, single phase, 60 Hz.
 - 7. Provide access to motor from front side of bleachers; a hinged front skirt or hinged section at least 30 inches wide is acceptable.

2.03 SEAT AND PLATFORM COMPONENTS

- A. Bench/Fascia Assembly: Upholstered Bench incorporating front fascia.
 - 1. Fascia:
 - a. Row 1 Fascia: 1" S275 Steel Profiled full length panel. Finish to be cleaned, Iron phosphate pre-treatment and epoxy powder coat. Color as selected from manufacture full range.
 - b. Fascias: to be fitted to the front of each platform to create a closed in, panelled effect when the seating platforms are closed. Panels to be 5/8" thick MDF with laminate finish and edges capped. Laminate to be selected from manufactures full range of options.
 - 2. Bench: Upholstered bench incorporating front fascia with laminate finish.
 - a. Backrest: Upholstered backrest in a steel frame. Steel frame to protect all edges of backrest.
 - b. Fabric : Flamblend range by Bradbury Fabrics or similar. Material and color to be selected by architect.
 - 3. Fire Retardance: Smoke developed index of 450 or less, when tested in accordance with ASTM E84.
- B. Platform, Tread, and Step Structure: Plywood continuously supported on front and rear with side joints tongue-and-grooved.
 - 1. Plywood: PS 1, tongue and groove spruce plywood, Grade A-C. Orientated for grain to run front to back on platform space-frame for extra stiffness.
 - 2. Plywood Thickness: 3/4 inch, minimum.
 - 3. Front (Nose), Rear, and Intermediate Supports: Steel channel or tube, hot-dipped galvanized.
 - 4. Provide end caps of same material and finish on each exposed end.
 - 5. Finish: High gloss clear urethane, both sides, unless polyethylene finished.
 - 6. Nosings: Extruded aluminum; non slip nosing, clear anodized finish.
 - 7. At aisles provide permanently attached intermediate steps of same construction and finish.
 - 8. At bottom of aisles provide step in front of first riser, hinged to first platform to fold for storage.

2.04 HANDRAILS AND RAILINGS

- A. Provide the following railings:
 - 1. Aisle Handrails: Single post folding railing segment mounted in center of aisle at every other row beginning at row 2.
 - 2. End of Row Guardrails: Removable, at open ends of sections beginning at row 2.
 - 3. Height: 42 inches above adjacent platform or tread.
- B. Design handrails and railings to withstand the following loads:
 - 1. Concentrated Load on Handrails: 200 pounds in any direction.

2. Concentrated Load on Guardrails: 200 pounds in any direction along top rail.
 3. Live Load on Handrails: 50 pounds per linear foot, applied in any direction.
 4. Live Load on Guardrails:
 - a. Horizontal: 50 pounds per linear foot, applied at the guardrail height.
 - b. Vertical: 100 pounds per linear foot, applied vertically to top of guardrail.
- C. Railing Construction: Round steel or aluminum pipe or tube, with formed elbows at corners and caps at ends of straight runs.
1. Aluminum: 1.66 inches minimum outside diameter; natural anodized finish.
 2. Steel: 1-1/2 inch minimum outside diameter, with 11 gage, 0.12 inch minimum wall thickness; textured powder coat epoxy finish.
 3. Infill: Vertical steel tubular members at 4" spacing. 3/4" x 3/4" x 1/16" ERW tube.

2.05 ACCESSORIES

- A. Fillers and Closures:
1. Ends of Retracted Units: Plywood panels, finished to match platforms.
 2. Top Row: Provide seat level rear filler panels to close openings between top row seat and wall; finish to match platforms.
 3. Sides of Extended Units: Vinyl curtains.
 4. Vinyl Curtains: 18 ounce vinyl with grommets; color as selected from manufacturer's standard palette.
- B. Fasteners: Provide hardware and fasteners in accordance with manufacturer's recommendations.
- C. Anchorage: As indicated on drawings; provide hardware in accordance with manufacturer's recommendations.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that field measurements are consistent with those on the shop drawings.
- B. Verify that electrical rough-ins have been installed and are accessible.
- C. Do not begin installation until substrates have been properly prepared and area has been cleared of obstructions.
- D. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.02 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.03 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Do not field cut or alter seats, fascia, or structural members without approval.
- C. Provide manufacturer's field representative to inspect completed installation.

3.04 ADJUSTING

- A. Lubricate, test, and adjust each moving assembly to ensure proper operation in compliance with manufacturer's recommendations.

3.05 CLEANING

- A. Clean exposed and semi-exposed assembly surfaces.
- B. Touch up finishes on damaged or soiled areas.

3.06 CLOSEOUT ACTIVITIES

- A. Demonstration and Training: Provide manufacturer's field representative to demonstrate to and train Owner's operating personnel in proper operation of equipment.
 - 1. Location: On site using installed equipment.
 - 2. Time: As agreed between Owner and CMGC Contractor .

3.07 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 6614

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**SECTION 14 2400
HYDRAULIC ELEVATORS**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Complete hydraulic elevator systems.
 - 1. Passenger type.
- B. Elevator Maintenance Contract.

1.02 RELATED REQUIREMENTS

- A. Section 03 3000 - Cast-in-Place Concrete: Includes elevator machine foundation, enclosed hoistway, elevator pit, divider beams, overhead hoist beams, grouting thresholds, and grouting hoistway entrance frames.
- B. Section 04 2000 - Unit Masonry: Masonry hoistway enclosure; building-in and grouting hoistway door frames.
- C. Section 05 1200 - Structural Steel Framing: Includes overhead hoist beams.
- D. Section 05 5000 - Metal Fabrications: Includes elevator pit ladder and sill supports.
- E. Section 07 8400 - Firestopping: Fire rated sealant in hoistway.
- F. Section 09 6813 - Tile Carpeting: Floor finish in car.
- G. Section 09 9123 - Interior Painting: Field painting of hoistway entrance doors and frames.
- H. Section 21 1300 - Fire-Suppression Sprinkler Systems: Sprinkler heads in hoistway.
- I. Section 26 0533.13 - Conduit for Electrical Systems:
- J. Section 26 0583 - Wiring Connections:

1.03 REFERENCE STANDARDS

- A. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.
- B. AISC 360 - Specification for Structural Steel Buildings; 2022.
- 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. ASME A17.1 - Safety Code for Elevators and Escalators Includes Requirements for Elevators, Escalators, Dumbwaiters, Moving Walks, Material Lifts, and Dumbwaiters with Automatic Transfer Devices; 2022.
- E. ASME A17.2 - Guide for Inspection of Elevators, Escalators, and Moving Walks Includes Inspection Procedures for Electric Traction and Winding Drum Elevators, Hydraulic Elevators, Inclined Elevators, Limited-Use/Limited-Application Elevators, Private Residence Elevators, Escalators, Moving Walks, Dumbwaiters, and Material Lifts; 2023.
- F. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2019.
- G. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2023.
- H. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2023.
- I. 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; 2023, with Editorial Revision.
- J. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2021.
- K. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric); 2021.
- L. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2020, with Errata (2023).

- M. NEMA LD 3 - High-Pressure Decorative Laminates; 2005.
- N. NEMA MG 1 - Motors and Generators; 2021.
- O. NFPA 13 - Standard for the Installation of Sprinkler Systems; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- P. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- Q. NFPA 80 - Standard for Fire Doors and Other Opening Protectives; 2022.
- R. PS 1 - Structural Plywood; 2023.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Coordination:
 - 1. Coordinate work with other installers to provide conduits necessary for installation of wiring including but not limited to:
 - a. Elevator equipment devices remote from elevator machine room or hoistway.
 - b. Telephone service for machine room.
 - c. Elevator pit for lighting.
 - d. Automatic transfer switch from controller cabinet.
 - e. Fire alarm panel from controller cabinet.
 - 2. Coordinate work with other installers for equipment provisions necessary for proper elevator operation, including but not limited to, the following:
 - a. Automatic transfer switches with auxiliary contacts for emergency power transfer status indication.
 - b. Shunt trip devices for automatic disconnection of elevator power prior to fire suppression system activation.
 - c. Overcurrent protection devices selected to achieve required selective coordination.
- B. Construction Use of Elevator: Not permitted.

1.05 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Product Data: Submit data on following items:
 - 1. Signal and operating fixtures, operating panels, and indicators.
 - 2. Car design, dimensions, layout, and components.
 - 3. Car and hoistway door and frame details.
 - 4. Electrical characteristics and connection requirements.
- C. Shop Drawings: Include appropriate plans, elevations, sections, diagrams, and details on following items:
 - 1. Elevator Equipment and Machines: Size and location of driving machines, power units, controllers, governors, and other components.
 - 2. Hoistway Components: Size and location of car guide rails, buffers, jack unit and other components.
 - 3. Rail bracket spacing; maximum loads imposed on guide rails requiring load transfer to building structural framing.
 - 4. Clearances and over-travel of car.
 - 5. Locations in hoistway and machine room of traveling cables and connections for car lighting and telephone.
 - 6. Location and sizes of hoistway and car doors and frames.
 - 7. Electrical characteristics and connection requirements.
 - 8. Indicate arrangement of elevator equipment and allow for clear passage of equipment through access openings.
- D. Samples: Submit samples illustrating car interior finishes in the form of cut sheets or finish color selection brochures.
- E. Testing Agency's Qualification Statement.

- F. Initial Maintenance Contract.

1.06 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum ten years documented experience.
- B. Installer Qualifications: Company specializing in performing the work of this section and approved by elevator equipment manufacturer.
- C. Testing Agency Qualifications: Independent firm specializing in performing testing and inspections of type specified in this section.

1.07 WARRANTY

- A. See Section 01 7800 - Closeout Submittals for additional warranty requirements.
- B. Provide manufacturer's warranty for elevator operating equipment and devices for one year from Date of Substantial Completion.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Basis of Design - Hydraulic Elevators: ThyssenKrupp; Endura Twinpost above-ground.
- B. Other Acceptable Manufacturers - Hydraulic Elevators:
 - 1. Schindler Elevator Corporation: www.schindler.com/#sle.
 - 2. Kone; www.kone.com.
- C. Substitutions: See Section 01 6000 - Product Requirements.
- D. Source Limitations: Provide elevator and associated equipment and components produced by the same manufacturer as the other elevator equipment used for this project and obtained from a single supplier.

2.02 HYDRAULIC ELEVATORS

- A. Hydraulic Passenger Elevator, No. 1 & 2:
 - 1. Hydraulic Elevator Equipment:
 - a. Holeless hydraulic with cylinder mounted within hoistway.
 - 2. Drive System:
 - a. Variable voltage variable frequency (VVVF) to modulate motor speed.
 - 3. Operation Control Type:
 - a. Selective Collective Automatic Operation Control.
 - 4. Service Control Type:
 - a. Standard service control only.
 - 5. Interior Car Height: 96 inch.
 - 6. Electrical Power: 480 volts; alternating current (AC); three phase; 60 Hz.
 - 7. Rated Net Capacity: 2500 pounds.
 - 8. Rated Speed: 110 feet per minute.
 - 9. Hoistway Size: As indicated on drawings.
 - 10. Interior Car Platform Size: As indicated on drawings.
 - 11. Elevator Pit Depth: 48 inch.
 - 12. Overhead Clearance at Top Floor: 149 at #1, & 172 at #2 inch.
 - 13. Travel Distance: As indicated on drawings.
 - 14. Number of Stops: As indicated on drawings.
 - 15. Number of Openings: 1 Front.
 - 16. Hydraulic Equipment Location: As indicated on drawings

2.03 COMPONENTS

- A. Elevator Equipment:
 - 1. Motors, Hydraulic Equipment, Controllers, Controls, Buttons, Wiring, Devices, and Indicators: Comply with NFPA 70; see Section 26 0583.

2. Guide Rails, Cables, Buffers, Attachment Brackets and Anchors: Design criteria for components includes safety factors in accordance with applicable requirements of Elevator Code, ASME A17.1.
 3. Buffers:
 - a. Spring type for elevators with speed less than or equal to 200 fpm.
 4. Lubrication Equipment:
 - a. Provide grease fittings for periodic lubrication of bearings.
- B. Electrical Equipment:
1. Motors: NEMA MG 1.
 2. Boxes, Conduit, Wiring, and Devices: As required by NFPA 70; see Sections 26 0533.13 and 26 0583.
 3. Spare Conductors: Provide ten percent in extra conductors and two pairs of shielded audio cables in traveling cables.
 4. Include wiring and connections to elevator devices remote from hoistway and between elevator machine room. Provide additional components and wiring to suit machine room layout. See Section 26 0583.

2.04 PERFORMANCE REQUIREMENTS

- A. Regulatory Requirements: Comply with ASME A17.1, ASME A17.1, applicable local codes, applicable local codes, authorities having jurisdiction (AHJ), and authorities having jurisdiction (AHJ).
- B. Accessibility Requirements: Comply with ADA Standards.
- C. Perform structural steel design, fabrication, and installation in accordance with AISC 360.
- D. Comply with seismic design requirements in accordance with ASME A17.1, ASME A17.1, applicable local codes, applicable local codes, authorities having jurisdiction (AHJ), and authorities having jurisdiction (AHJ).
 1. Complying with Elevator Safety Requirements for Seismic Risk Zone in accordance with ASME A17.1, ASCE 7 and other related requirements.
 2. Provide earthquake emergency operations in accordance with ASME A17.1 requirements.
- E. Perform welding of steel in accordance with AWS D1.1/D1.1M.
- F. Fabricate and install door and frame assemblies in accordance with NFPA 80 and in compliance with requirements of authorities having jurisdiction.
- G. Perform electrical work in accordance with NFPA 70.
- H. Comply with venting or pressurization of hoistway design in accordance with HVAC system requirements and authorities having jurisdiction (AHJ).
- I. Comply with fire protection sprinkler system of hoistway design in accordance with NFPA 13 requirements and authorities having jurisdiction (AHJ). See Section 21 1300.

2.05 OPERATION CONTROLS

- A. Elevator Controls: Provide landing operating panels and landing indicator panels.
 1. Landing Operating Panels: Metallic type, one for originating "Up" and one for originating "Down" calls, one button only at terminating landings; with illuminating indicators.
 2. Landing Indicator Panels: Illuminating.
- B. Interconnect elevator control system with building security, fire alarm, and smoke alarm systems.
- C. Door Operation Controls:
 1. Program door control to open doors automatically when car arrives at floor landing.
 2. Render "Door Close" button inoperative when car is standing at dispatch landing with doors open.
 3. Door Safety Devices: Moveable, retractable safety edges, quiet in operation; equipped with photo-electric light rays.

2.06 OPERATION CONTROL TYPE

- A. Selective Collective Automatic Operation Control: Applies to car in single elevator shaft.
 - 1. Refer to description provided in ASME A17.1.
 - 2. Automatic operation by means of one button in the car for each landing served and by "UP" and "DOWN" buttons at the landings.
 - 3. Stops are registered by momentary actuation of landing car buttons without consideration of the number of buttons actuated or the sequence buttons are actuated, but the stops are made in the order that landings are reached in each direction of travel.
 - 4. All "UP" landing calls are made when car is traveling in the up direction.
 - 5. All "DOWN" landing calls are made when car is traveling in the down direction.
 - 6. Uppermost and lowermost calls are answered as soon as they are reached without consideration of the car travel direction.

2.07 MATERIALS

- A. Rolled Steel Sections, Shapes, Rods: ASTM A36/A36M.
- B. Steel Sheet: ASTM A1008/A1008M, Designation CS (commercial steel), with matte finish.
- C. Sheet Steel: Hot-dipped galvanized steel sheet, ASTM A653/A653M, with G90/Z275 coating.
- D. Stainless Steel Sheet: ASTM A666, Type 304; No. 4 Brushed finish unless otherwise indicated.
- E. Extruded Aluminum: ASTM B221 (ASTM B221M), natural anodized finish unless otherwise indicated.
- F. Plywood: PS 1, Structural I, Grade C-D or better, sanded.
- G. Resilient Flooring: As specified in Section 09 6500.
- H. Plastic Laminate: NEMA LD 3, Type HGS, color as selected by Architect from manufacturer's full line of colors.

2.08 CAR AND HOISTWAY ENTRANCES

- A. Elevator, No. 1:
 - 1. Car and Hoistway Entrances, administration:
 - a. Hoistway Fire Rating: 2 Hours.
 - b. Elevator Door Fire Rating: 1-1/2 Hours.
 - c. Framed Opening Finish and Material: Alkyd enamel on steel.
 - d. Car Door Material: Alkyd enamel on steel, with rigid sandwich panel construction.
 - e. Hoistway Door Material: Alkyd enamel on steel, with rigid sandwich panel construction.
 - f. Door Type: Single leaf.
 - g. Door Operation: side opening, one speed.
 - h. Paint Color: As selected by Architect from manufacturer's full line.
 - i. Door Width: 42 inch.
 - j. Door Height: 84 inches.
 - k. Sills: Extruded aluminum.
- B. Sills/Thresholds: Configure to align with frame return and coordinate with floor finish.
- C. Gasketing: Provide acoustic type gasketing at hoistway doors and frames to eliminate audible noise due to car activities in the hoistway, and air pressure differential between hoistway and landing floors.

2.09 CAR EQUIPMENT AND MATERIALS

- A. Elevator Car, No. 1:
 - 1. Car Operating Panel: Provide main and auxiliary; flush-mounted applied face plate, with illuminated call buttons corresponding to floors served with "Door Open" button, "Door Close" button, and alarm button.
 - a. Panel Material: Integral with front return; one per car.
 - b. Car Floor Position Indicator: Above door with illuminating position indicators.

- c. Locate alarm button where it is unlikely to be accidentally actuated; not more than 54 inch above car finished floor.
 - d. Provide matching service cabinet integral with front return panel, with hinged door and keyed lock in each car.
 2. Ventilation: Single speed fan with grille in ceiling.
 3. Flooring: Resilient vinyl tile.
 4. Front Return Panel: Match material of car door.
 5. Walls: Plastic laminate on plywood.
 - a. Wall Finish: Chalkboard - F119
 - b. Base Finish: Chalkboard - F-119
 6. Handrails:
 - a. Quantity: 3
 - b. Type: 2" Flat Bar
 - c. Finish:
 7. Bumpers:
 - a. Quantity: 3
 - b. Types: 2" Flat Bar
 - c. Finish
 8. Ceilings:
 - a. Type: Suspended with LED
 - b. Frame Finish: Pitch Black - F-112
 9. Cab Fixtures:
 - a. Type: Traditional
 - b. Push Button Illumination: Blue
 - c. Swing Types: Column
 - d. Auxiliary Car Station: Off
 10. Hall Fixtures:
 - a. Type: Traditional
 - b. Push Button Illumination: White
 11. Hall Finishes:
 - a. Entrance Door Finish: Brushed Stainless - #4
 - b. Jamb Finish: Brushed Stainless - #4
 - c. Fixture Faceplate Finish: Brushed Stainless - #4

2.10 MACHINE ROOM FITTINGS

- A. Key Cabinet: Wall-mounted, lockable, keyed to building keying system, for control and operating panel keys.
 1. Provide two key cabinet keys.

2.11 FINISHES

- A. Field Painting: See Section 09 9123.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify existing conditions before starting this work.
- B. Verify that hoistway, pit, and machine room are ready for work of this section.
- C. Verify hoistway shaft and openings are of correct size and within tolerance.
- D. Verify location and size of machine foundation and position of machine foundation bolts.
- E. Verify that electrical power is available and of correct characteristics.

3.02 PREPARATION

- A. Arrange for temporary electrical power for installation work and testing of elevator components; see Section 01 5000 - Temporary Facilities and Controls for additional requirements.
- B. Maintain elevator pit excavation free of water.

3.03 INSTALLATION

- A. Coordinate this work with installation of hoistway wall construction.
- B. Install system components, and connect equipment to building utilities.
- C. Provide conduit, electrical boxes, wiring, and accessories; see Sections 26 0533.13 and 26 0583.
- D. Install hydraulic piping between cylinder and pump unit.
- E. Mount machines, motors, and pumps on vibration and acoustic isolators.
 - 1. Place on structural supports and bearing plates.
 - 2. Securely fasten to building supports.
 - 3. Prevent lateral displacement.
- F. Install hoistway, elevator equipment, and components in accordance with approved shop drawings.
- G. Install guide rails to allow for thermal expansion and contraction movement of guide rails.
- H. Accurately machine and align guide rails, forming smooth joints with machined splice plates.
- I. Install hoistway door sills, frames, and headers in hoistway walls; grout sills in place, set hoistway floor entrances in alignment with car openings, and align plumb with hoistway.
- J. Fill hoistway door frames solid with grout; see Section 04 2000.
- K. Structural Metal Surfaces: Clean surfaces of rust, oil or grease; wipe clean with solvent; prime two coats.
- L. Machine Room Components: Clean and degrease; prime one coat, finish with one coat of enamel.
- M. Wood Surfaces not Exposed to Public View: Finish with one coat primer; one coat enamel.
- N. Adjust equipment for smooth and quiet operation.

3.04 TOLERANCES

- A. Guide Rail Alignment: Plumb and parallel to each other in accordance with ASME A17.1 and ASME A17.2.
- B. Car Movement on Aligned Guide Rails: Smooth movement, without any objectionable lateral or oscillating movement or vibration.

3.05 FIELD QUALITY CONTROL

- A. See Section 01 4000 - Quality Requirements for additional requirements.
- B. Perform testing and inspection in accordance with requirements.
 - 1. Perform tests as required by ASME A17.2.
 - 2. Provide at least two weeks written notice of date and time of tests and inspections.
 - 3. Supply instruments and execute specific tests.
- C. Operational Tests:
 - 1. Perform operational tests in the presence of Owner and Architect.
 - 2. At an agreed time, and the building occupied with normal building traffic, conduct tests to verify performance.
 - a. Furnish event recording of each landing call registrations, time initiated, and response time throughout entire working day.

3.06 ADJUSTING

- A. Adjust for smooth acceleration and deceleration of car to minimize passenger discomfort.
- B. Adjust with automatic floor leveling feature at each floor landing to reach 1/4 inch maximum from flush with sill.

3.07 CLEANING

- A. Remove protective coverings from finished surfaces.

- B. Clean surfaces and components in accordance with manufacturers written instructions.

3.08 CLOSEOUT ACTIVITIES

- A. See Section 01 7800 - Closeout Submittals for closeout submittals.
- B. Demonstrate proper operation of equipment to Owner's designated representative.
- C. Demonstration: Demonstrate operation of system to Owner's personnel.
 - 1. Use operation and maintenance data as reference during demonstration.
 - 2. Briefly describe function, operation, cleaning and maintenance of each component.
- D. Training: Train Owner's personnel on cleaning and operation and maintenance of system.
 - 1. Use operation and maintenance manual as training reference, supplemented with additional training materials as required.
 - 2. Location: At project site, unless noted otherwise.

3.09 PROTECTION

- A. Do not permit construction traffic within car after cleaning.
- B. Protect installed products until Date of Substantial Completion.
- C. Touch-up, repair, or replace damaged products and materials prior to Date of Substantial Completion.

3.10 MAINTENANCE

- A. Provide Initial Maintenance Contract of elevator system and components in accordance with ASME A17.1 and requirements as indicated for 12 months from Date of Substantial Completion.
- B. Perform maintenance contract services using competent and qualified personnel under the supervision and direct employ of the elevator manufacturer or original installer.
- C. Examine system components monthly.
- D. Include systematic examination, adjustment, and lubrication of elevator equipment.
- E. Maintain and repair or replace parts, whenever required, using parts produced by original equipment manufacturer.
- F. Perform work without removing cars from use during peak traffic periods.
- G. Provide emergency call back service during regular working hours throughout period of this maintenance contract.
- H. Maintain an adequate stock of parts for replacement or emergency purposes, and have personnel available to ensure the fulfillment of this maintenance contract without unreasonable loss of time.

END OF SECTION 14 2400