

PROJECT MANUAL
Campbell County School District #1
Campbell County High School
Phase 3 – New High School Project

Job No. 2512



100% Construction Documents – VOLUME 1 OF 2

Owner:

Campbell County School District #1

1000 Camel Drive
Gillette, Wyoming 82716

Architect:

Plan One/Architects

225 W. Yellowstone Ave., Suite 4
Cody, Wyoming 82414

Design / Associate Architect:

DLR Group

1401 Lawrence St., Suite 1000
Denver, Co 80202

Set No:

Date: September 21, 2026

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BIDDING DOCUMENTS

FOR DESIGN BID BUILD CONTRACTOR SERVICES

BIDDING REQUIREMENTS

NOTICE

Notice is hereby given that the Board of Trustees, **Campbell County School District, 1000 West 8th Street, Gillette, WY 82717**, hereinafter referred to as the "owner", will receive sealed bid proposals for the **Campbell County High School – Phase 3-5, 1000 Camel Way, Gillette, WY 82717**.

DESCRIPTION OF WORK

The Campbell County School District is redeveloping its High School Campus through a phased program including new athletic and educational facilities.

Phase 1: Site Demolition (Complete)

Phase 2: New Athletic Stadium and Amenities (Under Construction, Separate Contract)

Phase 3: New Campbell County High School

Phase 4: Demolition of approximate 300,000sf existing HS

Phase 5: Development of new parking and site improvements

Revised April 2025

The project was authenticated by SFD through means of a Most Cost-Effective Remedy (MCER), determining that the Capacity, Condition and Adequacy of the current CCSD High School required improvements to maintain the best educational environment and financial position of the State.

Phase 3 includes the demolition of the existing athletic fields and facilities following the 2026 Fall sports season, utility relocations and modifications, earthwork and site development, aggregate piers, superstructure typical of public education facilities including concrete, steel, masonry and metal framing. Interior fit out of facilities including educational spaces, administrative offices, cafeteria and athletics. The total SFD appropriated scope area is equal to 191,662 Square Feet and has a capacity for 1200 Students. CCSD intends to also include enhancements to the project including a primary Gym, an Auxiliary Gym, Weight Room and Cooling capacity for the primary Gym. The total square footage for these enhancements is 20,500, bringing the building total to approximately 212,000 square feet.

Phase 4 includes demolition of the existing approximately 300,000 sf high school after students and staff have relocated to the new high school.

Phase 5 consists of site development, new parking lot and drives, landscaping and site amenities in the footprint of the former school to support the new campus functions.

Bid Schedule

RFP Schedule		
State Construction Department Notice to Construct	9/15/2026	
Issue Request for Proposals (RFP) to shortlisted firms	9/21/2026	N/A
Site Walk	10/6/2026	1:00 PM
Questions & Substitution Requests Due	10/12/2026	1:00 PM
Questions & Substitution Responses Sent	10/19/2026	1:00 PM
Bid Opening	11/3/2026	1:00 PM
CCSD Board Approval	11/10/2026	
Notice to Proceed	11/11/2026	N/A
Construction Schedule		
Anticipated Construction Mobilization	December 2026	N/A
Phase 3a Substantial Completion Date / Certificate of Occupancy issued – High School	March 2029	N/A
Phase 3c & 3b - Final Completion Date	July 2029	N/A

BID OPENING

BIDS WILL BE RECEIVED AS FOLLOWS:

- ✓ Bids will be received in paper format until **1:00 PM, November 3rd, 2026**, in the District's Office located at, **1000 West 8th Street, Gillette, WY 82717**, then publicly opened and read aloud.

PRE-BID CONFERENCE

- ✓ Mandatory, held at **Campbell County School District at 2:00 PM, October 6th at 1000 West 8th Street, Gillette, WY 82717.**

BIDDING DOCUMENTS

Revised April 2025

Bidding Requirements

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The Bidding Documents may be obtained by visiting the SFD Website at:

<http://sfd.wyo.gov/home>

Steps

- Step One – Click on “School Facilities” and choose “Projects” from the drop-down menu.
- Step Two - Click on “School District Bid Information” on the left side of the page
- Step Three – Click on “Listing of Upcoming and Current District Projects-QuestCDN”
- Step Four– On the left side of the page find the project that you are interested in and click on the project name.
- Step Five– Across the top will be a toolbar stating “View Plan Holders”, “Download Bid Documents”, “Download Addenda”, and “View Bid Documents”. To download the bid documents you will click on “Download Bid Documents”.
- Step Six– Once you click on “Download Bid Documents” you will enter your QuestCDN username and password or click on the “join” button. It is here you will fill out all of your companies’ information which will be added to the plan holders list and you will receive the bidding documents.

CLARIFICATION AND INTERPRETATION OF BID DOCUMENTS OR REQUEST TO USE ALTERNATE PRODUCTS

Bidders and sub-bidders having questions, requiring clarification, interpretation or any RFIs (Request for Information) regarding the procurement documents shall make a written request via email to **Plan One – Taylor Lee** at tlee@planone.com, with a copy to **Sean Mathes** at smathes@ccsd.k12.wy.us and **Austin Rosenthal** at austin.rosenthal@artaicgroup.com. Interpretations, corrections, and changes of the contract documents shall be made by Addendum no later than **October 19th, 2026**. Interpretations, corrections, and changes of the contract documents made in any other manner will not be binding, and bidders and sub-bidders shall not rely upon them.

Requests to use “Alternate, or Equal Products” other than those specified in the contract documents are due no later than **1:00 PM, October 12th, 2026**. Bidders and sub-bidders must submit via email directly to Plan One-Taylor Lee at tlee@planone.com, with a copy to Sean Mathes at smathes@ccsd.k12.wy.us and **Austin Rosenthal** at austin.rosenthal@artaicgroup.com, all manufacturers’ specifications, descriptive literature, finishes and fabrics available, and any other pertinent information requested, for product approval will not be accepted. Addenda regarding any of the above will be provided to all who are known by the issuing office to have received a complete set of procurement documents not later than **October 19th, 2026**.

ACCESS TO PROJECT SITE

A non-mandatory site walk will be held on October 6th, 2026, at 1:00 PM. Access at times other than the scheduled site walk is strictly prohibited.

BID SECURITY (REQUIRED IF BID EXCEEDS \$150,000.00 W.S. 9-2-3004(c)(iv)(A) and SCD Rules)

Bid security in the amount of ten percent (10%) of the base bid will be required in the form of a Bid Bond, Cashier's Check or Certified Check payable to the owner. Security will be returned to unsuccessful bidders. The bid security will be retained by owner as liquidated damages if the successful bidder refuses or fails to enter into a contract within ten (10) days after a letter of intent is provided to the contractor or fails at the time of executing the contract to furnish all post bid submittals including bonds covering their faithful performance of the contract and payment of all obligations.

Bid Bonds shall be AIA Document A310 (2010 Edition) or on a document that conforms with AIA Document A310, and so states in the printed body of the form.

ADDENDA

Each bidder shall ascertain prior to submitting a bid that the bidder has received all Addenda issued, and the bidder shall acknowledge their receipt on the Bid Form bound herein. If your company has already downloaded the construction documents you will automatically be notified via e-mail if any addenda are issued.

Addenda will be posted on the SFD web site at:

<http://sfd.wyo.gov/home>

Steps

- Step One – Click on “School Facilities” and choose “Projects” from the drop-down menu.
- Step Two - Click on “School District Bid Information” on the left side of the page
- Step Three – Click on “Listing of Upcoming and Current District Projects-QuestCDN”
- Step Four– On the left side of the page find the project that you are interested in and click on the project name.
- Step Five– Across the top will be a toolbar stating “View Plan Holders”, Download Bid Documents”, “Download Addenda”, and “View Bid Documents”. To download the addenda you will click on “Download Addenda”.
- Step Six– Once you click on “Download Addenda” you will enter your QuestCDN username and password or click on the “join” button. It is here you will fill out all of your companies’ information which will be added to the plan holders list and you will receive the bidding documents.

PRODUCT DELIVERY

F.O.B. Destination required to project site.

SUBMISSION OF BIDS

BIDS WILL BE RECEIVED AS FOLLOWS:

Check the applicable box.

- ☒ Bids will be received in paper format until **1:00 PM, November 3rd, 2026**, in the District’s Office located at, **1000 West 8th Street, Gillette, WY 82717**, then publicly opened and read aloud.

If the box is checked for bids to be submitted in an electronic format, all bidding shall be done through the online bidding system. If the box is checked for bids to be received in paper format the following process shall apply.

Bids shall be submitted on the BID FORM included in the specifications.

Fill in all blank spaces for bid prices **in ink or typewritten** words, and submit one (1) copy. The Bidder must include all unit cost items and all Alternates shown on the Bid Form. No segregated or qualified bids will be accepted. Total bid prices are to be written both by words and by figures in case of conflict the written word will apply.

Bids shall be completed and signed in ink. Bids by partnerships must be signed with the partnership name by one of the partners, followed by the signature and designation of the partner signing.

Bids by corporations must be signed with the legal name of the corporation as it is registered with the secretary of state, followed by the signature of the president, secretary, or other person authorized to bind it in the matter. The name of the person signing shall be typed or printed below the signature.

If erasures or other **changes** appear on the bid forms, each erasure or change must be initialed by the person signing the bid. Do not deface or alter any portion of the original bid. Remarks should be shown as annotations to the bid.

Bid forms, and any other documents required to be submitted with the bid, **shall be enclosed in a sealed envelope** and shall be clearly marked as follows:

BID FOR: Campbell County High School – Phases 3 – 5

BID OPENING TIME & DATE: 2:00 PM, November 3rd, 2026.

BIDDER'S NAME:

BIDDER'S ADDRESS:

BIDDER'S TELEPHONE NUMBER:

The bidder assumes full responsibility for timely delivery at the location specified for receipt of bids.

Bids received after the exact time noted above will be returned unopened to the bidder. Any bid modification received after the exact time noted will not be considered.

Bids may be delivered in person, via United States mail or parcel service; Bids will not be received by facsimile transmission, or e-mail.

LIST OF PROPOSED SUBCONTRACTORS and SUPPLIERS – Exhibit B

A list of proposed subcontractors shall be provided at the time of bid submission. The list shall give the following required information for each proposed subcontractor for the project:

1. Description of work.
2. Contractors full legal name including DBA'S or subsidiaries.
3. Subcontractor Amount (All subcontracts, self-performed work, general conditions and suppliers must equal the bid amount.)
4. Suppliers.

The list of proposed subcontractors and suppliers, in addition to certificates of residency for each Wyoming resident proposed subcontractor listed, must be provided. The general contractor is not allowed to change the list of proposed subcontractors; failure to fill out the form completely and as required may result in rejection of the bid.

MODIFICATION OR WITHDRAWAL OF BID PRIOR TO BID OPENING

Bids which modify any of the provisions of the Bidding or Contract documents will not be considered.

A bid that is in the possession of **Campbell County School District** may be altered by letter or FAX bearing the signature or name of the person authorized for bidding, provided it is received prior to the date and time of the bid opening. **A letter or FAX should not reveal the bid price but should indicate the addition, subtraction, or other change in the bid.** The Owner and the Architect are not responsible for any logistics, coordination and communication processes.

Bid Forms or packets received by the Planning and Construction Office after the bid opening time may be opened provided the forms had been received and are in the possession of the district's mail room prior to the bid opening.

A bid that is in the possession of **Campbell County School District** may be withdrawn by the bidder up to the time of the bid opening.

Bids may not be modified, withdrawn or canceled for forty-five (45) days after the bid opening date.

CONSIDERATION OF BIDS

Per W.S. 21-3-110 (viii) the owner shall reserve the right to reject any and all bids and to waive irregularities and informalities in the bidding without further obligation and to accept any bid deemed in the best interest of the State of Wyoming and **Campbell County School District**. The owner does not bind themselves in any way to accepting the low bid.

In case of error in the extension prices in the bid, the unit price will govern. In case of discrepancy between written and numerical numbers the written price will govern. This interpretation will apply to the Base Bid, Alternates, and any prices where written prices are indicated.

Among the reasons the owner may reject any bid is if any of the following required information is not provided, is incomplete or is not submitted at the time required:

- 1) BID FORM
 - a. Bidder information including state residency.
 - b. Acknowledgment of Addenda.
 - c. Base Bid price.
 - d. Alternate Bid price (if any).
 - e. Unit Prices (if any).
 - f. Signature and company information.
2. BID SECURITY
 - a. Appropriate form completed, signed and witnessed.
3. LIST OF PROPOSED SUBCONTRACTORS
 1. Description of work.
 2. Proposed subcontractor's full-legal company name, including (DBA's or subsidiaries).
 3. Proposed subcontractor's amount.
 4. Proposed subcontractor's Certificates of Residency.

A bid recommended for rejection based upon a bidding irregularity may be brought up for owner review prior to the approval of the recommended proposal being acted upon by the owner. The owner following explanation of the circumstances of the irregularity may elect to waive the bidding irregularity if it is found to be in the best interest of the owner.

All other requirements placed upon bidders in these specifications must be met at the time of the bid submission in the manner directed by the owner. The failure of the bidder to meet any of these additional requirements may also result in the rejection of the bid.

WYOMING SALES AND USE TAX

Direct purchases of materials by the State of Wyoming or its political subdivisions (including **Campbell County School District**) are exempt from Wyoming Sales and Use Tax.

Contractors purchasing and consuming materials, equipment and supplies for their performance of alterations, improvements or repairs of real property in contracts with the State of Wyoming, its departments and institutions and the political sub-divisions thereof (including **Campbell County School District**) are subject to the Wyoming Sales and Use Tax.

It is an expressed condition of this contract that the contractor be aware of Wyoming Statutes pertaining to sales tax, use tax, and payment of sales and use tax by contractors, and conform as required.

As part of this requirement the contractor shall obtain from the Wyoming Department of Revenue a Sales and Use Tax License to conduct business in the State of Wyoming. When the total amount of the contract exceeds \$25,000.00, it is required that the license be issued in and for the County in which the materials, goods, fixtures and furnishings, and all other tangible personal property required by this contract are consumed.

All original purchases by a contractor for this project shall be on a non-retail basis (purchased for re-sale) from the original supplier (unless Sales Tax has been paid to another state). Upon the use, installation or transfer of such purchases as a sale by a vendor licensed in the County, State of Wyoming, of an item of tangible personal property as defined in the above cited statutes. The Contractor shall accordingly pay any and all tax due.

The Contractor shall cause each of his subcontractors to abide and perform their work on the same terms and conditions as provided in the above. The Contractor shall cause the above statement to be inserted in any contract or agreement between the contractor and his sub-contractors.

For additional information, contact: The Department of Revenue, 122 West 25th Street, Suite E301, Cheyenne, Wyoming.

PREFERENCE TO WYOMING CONTRACTORS, LABORERS, MATERIALS AND PRODUCTS

The following are pertinent sections of the Wyoming Statutes pertaining to Preference to Wyoming Contractors, Laborers, Materials, and Products. Wyoming Statutes will govern over all provisions stated here. For further information, the complete statutes are available at the Law Library located in the Supreme Court Building, 2301 Capitol Avenue, Cheyenne, Wyoming, at the Support Operations Office or online at <http://legisweb.state.wy.us>.

A portion of "16-6-101". Definitions.

(a) As used in this act:

(i) "Resident" means a person, partnership, limited partnership, registered limited partnership, registered limited liability company or corporation **certified as a resident by the Department of Workforce Services prior to bidding upon the contract or responding to a request for proposal**, subject to the following criteria:

(ii) "Office and place of business" means a headquarters or administrative center where business activities are conducted or controlled;

(iii) "This act" means W.S. 16-6-101 through 16-6-121.

A portion of "16-6-102". Resident contractors; preferences limitations with reference to lowest bid; decertification; denial of application for residency.

The contract will be let to the responsible certified resident making the lowest bid if the certified resident's bid is not more than five percent (5%) higher than that of the lowest responsible non-resident bidder. (A portion of "16-6-102(a)").

If a nonresident bidder submits the low bid, the bid amount will be multiplied by one point zero five (1.05) for comparison to the bids submitted by resident bidders. The bidder with the lowest adjusted bid will be considered low bidder.

ALL RESIDENT AND NON-RESIDENT CONTRACTORS are required to register with the following:

Secretary of State (307) 777-7378.

Department of Revenue, (307) 777-7961.

Department of Workforce Services, Division of Unemployment Insurance, (307) 235-3217.

A portion of "16-6-103". Limitation on subcontracting by resident contractors.

A successful resident Bidder shall not subcontract more than thirty percent (30%) of the work covered by his contract to nonresident contractors.

The Owner will implement the bid preference of Wyoming law as follows:

No resident contractor's bid will be rejected solely because the bidder indicates an intention to subcontract more than thirty percent (30%) of the work to nonresident contractors.

If the lowest responsible bid received is that of a resident bidder, the low bidder will be awarded the contract, unless the low bidder has indicated an intention to subcontract more than thirty (30%) of the work to nonresident contractors.

If a nonresident bidder submits the low responsible bid and a responsible bid is received from a resident bidder who does not contract more than thirty (30%) of the work to nonresident contractors, the nonresident's bid will be adjusted by multiplying the amount by one-hundred and five percent (105% or 1.05) to obtain the adjusted bid. The nonresident's adjusted bid will then be compared to the lowest responsible bid submitted by a resident bidder who does not contract more than Thirty percent (30%) of the work to nonresident contractors. The bidder with the lowest adjusted bid will be considered the low bidder. No preference consideration will be given to bids received from resident bidders who contract more than thirty percent (30%) of the work to nonresident contractors.

The contract will be awarded to lower of the adjusted nonresident bid and the low bid received from a resident bidder who does not contract more than thirty percent (30%) of work to nonresident contractors. (W.S.16-6-102 and 103).

If a nonresident bidder submits the low responsible bid and all responsible resident bidders indicate an intention to subcontract more than thirty percent (30%) of the work to nonresident contractors, the contract will be awarded to the low bidder without making any adjustment to the nonresident bid.

If either labor or a combination of labor and materials is purchased from a nonresident proposed subcontractor, the total amount of all subcontracts for labor and/or labor and materials will be considered in determining whether the thirty percent (30%) limit has been reached. Subcontracts for materials alone will not be considered in determining whether the thirty percent (30%) limit on subcontracts with nonresident contractors has been reached.

NOTICE TO ALL CONTRACTORS, PROPOSED SUBCONTRACTORS, AND SUPPLIERS:

In order to be considered as a "*Wyoming Resident Contractor*", your firm must be registered with the State of Wyoming, Department of Workforce Services telephone (307) 777-8650.

Being registered with the Wyoming Secretary of State or residing in and working as a contractor in Wyoming does **NOT** qualify your firm for "Residency Status".

Application must be made for "*Residency Status*" and approved by the Labor Standards Division pursuant to Wyoming State Statutes 16-6-101 - 16-6-206. The apparent low four (4) bidders at time of bid opening will be given 24 hours to provide "Certificate of Residency" for all proposed subcontractors.

A portion of “16-6-104”. Preference for Wyoming labor and materials required in contracts.

Resident Wyoming laborers, workmen and mechanics shall be used upon all work enumerated in W.S. 16-6-102 whenever possible and any contract let shall so provide. Wyoming materials and products of equal quality and desirability shall have preference over materials or products produced outside the state and any contract let shall so provide.

A portion of “16-6-106”. Statement of Wyoming materials preference in requests for bids and proposals.

All requests for bids and proposals for materials, supplies, agricultural products, equipment, machinery and provisions for the construction, maintenance and upkeep of every state, county, municipal, community college district or school district institution shall contain the words “preference is hereby given to materials, supplies, agricultural products, equipment, machinery and provisions produced, manufactured, or grown in Wyoming, or supplied by a resident of the state, quality being equal to articles offered by the competitors outside of the state”.

A portion of “16-6-203”. Required resident labor on public works projects; exception.

Wyoming labor shall be used except other laborers may be used when Wyoming laborers are not available for the employment from within the state or are not qualified to perform the work involved. A person required to employ Wyoming laborers may employ other than Wyoming laborers if that person informs the nearest state workforce center of his employment needs and the state workforce center certifies that the person’s need for laborers cannot be filled from those listed as of the date the information is filed.

Apprenticeship Utilization Program (W.S. 16-6-901 - 16-6-902).

“For all public works awarded by the State of Wyoming, the University of Wyoming, a community college or a school district pursuant to W.S. 16-6-101 through 16-6-206 estimated to cost one million dollars (\$1,000,000.00) or more, a contractor who commits to ensure that not less than ten percent (10%) of the labor hours shall be worked by apprentices shall have his bid considered as if his bid were one percent (1%) lower than the actual dollar value of his bid.”

The Apprenticeship Utilization Program allows for a One percent (1%) bid preference on all public works projects costing over \$1,000,000.00. If contractors elect to invoke the bid preference on this project, additional paperwork will be submitted with the bid package. For example, if electing the preference, the contractor will submit a Letter of Certification from the U.S. Department of Labor, Wyoming’s Bureau of Apprenticeship and Training with the bid documents. Bids may then be considered as if they were one percent (1%) lower than the actual face value.

CONTRACT WORK HOURS

Work shall be limited to no more than eight (8) hours in any one (1) calendar day, or forty (40) hours in any one (1) week. The employee may agree to work more than eight (8) hours per day or more than forty (40) hours in any week provided the employee is paid at the rate of one and one-half (1-1/2) times the regularly established hourly rate for all work in excess of forty (40) hours in any one (1) week. (A portion of “W.S. 16-6-110”.)

WAGE RATE GUIDELINES

No wage rate guidelines will be established for this project.

DISCRIMINATION

The owner hereby notifies all bidders that it will affirmatively ensure that minority business enterprises are afforded full opportunity to submit in response to this invitation, and are not discriminated against on the grounds of age, race, religion, color, sex, national origin or ancestry in consideration for award of contract.

PERFORMANCE BOND AND LABOR AND MATERIAL PAYMENT BOND (REQUIRED IF BID EXCEEDS \$150,000.00 W.S. 16-6-112)

A Performance Bond covering the faithful performance of the contract and a Labor and Material Payment Bond covering the payment of all obligation arising under this project, each equal to one hundred percent (100%) of the contract sum shall be furnished by the bidder prior to issuance of the Contract. All bonds must be executed by a corporate surety which: (1) is licensed to transact business in the State of Wyoming; (2) is named in the current list of "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Circular 570 (amended) by the U.S. Treasury Department and Contractor's bond for this Project is in compliance with the limitations stated in the Circular; and (3) has an A.M. Best & Company rating of "A" or better; and all bonds are accompanied by an appropriate power of attorney from the surety, and are otherwise acceptable to Owner. **Bonds shall be AIA Document A312 (2010 Edition)** or on a document that conforms with AIA A312 and so states in the printed body of the form. The cost of all bonds shall be included in the bid. **CONTRACTS WILL NOT BE ISSUED OR NOTICE TO PROCEED GIVEN UNTIL THESE DOCUMENTS ARE IN THE POSSESSION OF THE DISTRICT.**

ACTIONS NEEDED TO PRESERVE RIGHTS OF PROPOSED SUBCONTRACTORS AND MATERIAL SUPPLIERS UNDER BOND OR GUARANTEE. (W.S. 16-6-121 and W.S. 29-2-110)

If the project's contract is for \$50,000 or more, the contractor shall take appropriate actions needed to preserve rights of subcontractors and material suppliers under bond or guarantee (W.S. 16-6-121 and W.S. 29-2-110).

16-6-121. Notice required to receive protection under a bond or guarantee; limitation; notice required by owner in project specifications.

(a) Any subcontractor or material man entitled to the protection of a bond or other form of guarantee approved by the state or any political subdivision under W.S. 16-6-112 shall give notice of his right to that protection to the prime contractor. Failure to give notice to a prime contractor who has complied with subsections (f) and (g) of this section waives the subcontractor or materialman's protection under the bond or guarantee and waives any right to a lien for materials or services provided.

(b) The notice shall be given no later than sixty (60) days after the date on which services or materials are first furnished.

(c) The notice shall be sent to the prime contractor by certified mail or delivered to and receipted by the prime contractor or his agent. Notice by certified mail is effective on the date the notice is mailed.

(d) The notice shall be in writing and shall state that it is a notice of a right to protection under the bond or guarantee. The notice shall be signed by the subcontractor or materialman and shall include the following information:

(i) The subcontractor or materialman's name, address and phone number and the name of a contact person;

(ii) The name and address of the subcontractor's or materialman's vendor; and

(iii) The type or description of the materials or services provided.

(e) This section shall only apply where the prime contractor's contract is for fifty thousand dollars (\$50,000.00) or more.

(f) The prime contractor shall post on the construction site a prominent sign citing this section and stating that any subcontractor or materialman shall give notice to the prime contractor of a right to protection under the bond or guarantee and that failure to provide the notice shall waive the subcontractor or materialman's protection under the bond or guarantee and shall waive any right to a lien for materials or services provided.

(g) The owner or his agent shall provide written notice of the information required by this section in the project specifications.

FORM OF AGREEMENT BETWEEN OWNER AND CONTRACTOR

The agreement for the work will be the agreement between **Campbell County School District** and the Contractor, utilizing the School Facilities Commission's approved Design Bid Build agreement.

END OF BIDDING REQUIREMENTS SECTION

COMPANY NAME: [Enter firm name](#)

BID FORM

DO NOT MODIFY BID FORM - Any modification or alteration to this form from its original format will result in rejection of the bid.

BID FORM TO BE COMPLETED IN ITS ENTIRETY, INCLUDE COMPANY NAME ON EACH PAGE WHERE INDICATED, AND SIGNED IN INK. SUBMIT BID FORM IN ITS ENTIRETY.

BID FOR: [Campbell County High School](#)

BID TIME & DATE: [1:00 PM, November 3rd, 2026](#)

TO: (District) [Board of Trustees](#)
[Campbell County School District](#)
[Enter District Address](#)
[City, State, ZIP](#)

BIDDER:

Legal Name of Firm

Address

City

State

ZIP

BID SECURITY (Required if Bid Exceeds \$150,000.00 W.S. 9-2-3004(c)(iv)(A) and SCD Rules)
Bid security in the amount of ten percent (10%) of the base bid will be required in the form of a Bid Bond, Cashier's Check or Certified Check payable to the owner. Security will be returned to unsuccessful bidders. The bid security will be retained by owner as liquidated damages if the successful bidder refuses or fails to enter into a contract within ten (10) days after same is let to him or fails at the time of executing the contract to furnish all post bid submittals including bonds covering their faithful performance of the contract and payment of all obligations arising there under. Bid Bonds shall be **AIA Document A310 (2010 Edition)** or on a document that conforms with AIA Document A310, and so states in the printed body of the form.

PERFORMANCE BOND AND PAYMENT BOND (Required if Bid Exceeds \$150,000.00 W.S. 16-6-112)
It is agreed by the undersigned, if awarded the contract, to execute and deliver to the owner, prior to issuance of the contract, a Performance Bond covering the faithful performance of the contract, and a Labor and Material Payment Bond covering the payment of all obligation arising under this project, each equal to one hundred percent (100%) of the Contract Sum. **Bonds shall be AIA Document A312 (2010 Edition)** or on a document that conforms with AIA A312 and so states in the printed body of the form. **CONTRACTS WILL NOT BE ISSUED OR NOTICE TO PROCEED GIVEN UNTIL THIS DOCUMENT IS IN THE POSSESSION OF THE DISTRICT.**

COMPANY NAME: [Enter firm name](#)

PROJECT MANAGER: Bidders must submit on a separate sheet-the following:

- Resume with qualifications as project manager of projects in similar scope on which they performed as lead project manager. Include current job assignments and educational degrees, diplomas, trade schools, apprentice and other training programs, and continuing education courses, programs or seminars.
- References.

COMPANY NAME: Enter firm name

COMPANY NAME: Enter firm name

CURRENT WORK AFFIDAVIT:

List major projects your organization has in progress, giving the name of the project, owner, architect, contract amount, percent complete and scheduled completion date. Complete and submit a “Work In Progress Form” and include the Total Work of Work in Progress and Under Contract.

Work In Progress

Date Awarded	Owner	Project Name	Contract Value	Description of Project

FINANCIAL:

Bidders should be prepared to submit the following after bid opening if requested by the Architect.

A financial statement, preferably audited, including your organization’s latest balance sheet and income statement showing the following items:

- Current Assets (e.g., cash, joint venture accounts, accounts receivable, notes receivable, accrued income, deposits, materials inventory and prepaid expenses).

- Net Fixed Assets.
- Other Assets.
- Current Liabilities (e.g., accounts payable, notes payable, accrued expenses, provision for income taxes, advances, accrued salaries, and accrued payroll taxes).
- Long-term Liabilities (e.g., notes or mortgages payable).
- Equity Accounts (e.g., capital, capital stock, authorized and outstanding shares par values, earned surplus and retained earnings).
- Name and address of firm preparing attached financial statement, and date.
- The financial statement for the identical organization named on Page 1 of this form must be included;
 - If not, explain the relationship and financial responsibility of the organization whose financial statement is provided (e.g., parent-subsidary).
 - State whether or not the organization's whose financial statement is attached will act as guarantor of the contract for construction.

COMPANY NAME: Enter firm name

CONTRACT TIME:

It is agreed by the undersigned that, if awarded the contract, the successful Bidder will have the project at substantial completion by **the agreed-upon date for the issuance of a Certificate of Occupancy**, or liquidated damages will apply.

Schedule

The project schedule will be bid per the prescribed mobilization and completion dates listed above. If an alternate schedule is provided, that schedule will also include cost differentials that accompany that change in approach.

CONDITIONS APPLICABLE TO SUBSTANTIAL COMPLETION

Substantial Completion is the stage in the progress of the Work when the Project Architect has determined that the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents, including substantial completion of all punch list items to be performed by the Contractor and Subcontractors so Owner can occupy the Work for the purpose of performing its preparatory tasks to make the Work suitable for its intended use as a school building.

LIQUIDATED DAMAGES:

The Contractor and the Contractor’s surety, if any, shall be liable for and shall pay the Owner the sums hereinafter stipulated as liquidated damages as follows:

It is expressly agreed as a part of the consideration inducing Owner to execute this Agreement that Owner may deduct from the Final Payment made to Contractor a dollar amount per day established by the matrix set forth below for each and every additional calendar day beyond the agreed date of Substantial Completion.

Contract Range	Daily Liquidated Damages Charge
\$0.00 - \$500,000	\$ 250.00
\$500,001 - \$1,000,000	\$ 500.00
\$1,000,001 - \$2,000,000	\$ 750.00
\$2,000,001 - \$3,000,000	\$ 1,000.00
\$3,000,001 - \$5,000,000	\$ 1,250.00
\$5,000,001 - \$7,500,000	\$ 1,500.00
\$7,500,001 - \$10,000,000	\$ 1,750.00
\$10,000,001 - \$15,000,000	\$ 2,000.00
\$15,000,001 - \$20,000,000	\$ 2,250.00
\$20,000,001 and Greater	\$ 2,500.00

If the Contractor has not completed all Punch List items within 30 days from when the list was generated or as agreed to by the Owner, the Owner may address the Punch List items with other forces and back-charge the Contractor for those forces in addition to days of non-compliance.

ADDITIONAL BIDDING REQUIREMENTS:

The undersigned also agrees that he will not withdraw his bid for a period of forty-five (45) days from the date of Revised April 2025

bid opening.

In submitting this bid, be it understood, the owner reserves the right to waive irregularities and informalities, to reject any or all bids without further obligation, and to accept any bid deemed desirable.

COMPANY NAME: [Enter firm name](#)

The undersigned also agrees to furnish all items identified in Article 5 Preliminary Matters per the Design Bid Build Construction Agreement within ten (10) calendar days of the Notice of Intent to Award Contract.

- a. Performance Bond (if required)
- b. Labor and Material Payment Bond (if required)
- c. Certificate of Insurance listing both the District and SFD as additionally insured
- d. Construction schedule
- e. Schedule of Values

The undersigned agrees to maintain Wyoming Worker's Compensation and Wyoming Unemployment Insurance in good standing throughout the duration of the project until final payment by the owner. The contractor shall submit copies of the certificates within ten days upon the owner's request.

By submission of this proposal the bidder certifies:

A. NON-COLLUSION AFFIDAVIT OF PRIME BIDDERS

1. He is the bidder that has submitted this bid, and that he has the authority to sign on its behalf.
2. He is fully informed respecting the preparation and contents of the attached bid of all pertinent circumstances respecting such bid.
3. Such bid is genuine and is not a collusive or sham bid.
4. Neither the said bidder nor any of its officers, partners, owners, agents, representatives, employees or parties in interest, including this affiant, has in any way colluded, conspired, connived or agreed, directly or indirectly with any other bidder, firm or person to submit a collusive or sham bid in connection with the contract of which the attached bid has been submitted or to refrain from bidding in connection with such contract, or has in any manner, directly or indirectly, sought by agreement, collusion, communication or conference with any other bidder, firm or person to fix the price or prices in the attach bid or of any other bidder; to fix any overhead, profit, or cost element of the bid price or the bid price of any other bidder; or to secure through any collusion, conspiracy, connivance or unlawful agreement any advantage against the owner or any person interested in the proposed contract.

B. CERTIFICATE OF NON-DISCRIMINATION

The bidder hereby certifies that all persons employed by their firm, their affiliates, subsidiaries, or holding companies are treated equally by their firm without regard to or because of race, religion, ancestry, national origin or sex as required by federal and state anti-discrimination laws. The bidder further certifies and agrees that it will deal with subcontractors, bidders or vendors without regard to or because of race, religion, ancestry, national origin or sex. Violation of this certification may constitute a material breach of contract upon which the owner may determine to cancel, terminate, or suspend the contract.

COMPANY NAME: [Enter firm name](#)

Section below is to be completed ONLY if submitting via hard copy. If submitting digitally, please complete the bid worksheet section of the online bid form.

ADDENDA: The following addenda to the Contract Documents are acknowledged:

Addendum No. _____ Dated _____

Addendum No. _____ Dated _____

BID SUMMARY

A. BASE BID

TOTAL BASE BID _____

_____ (\$ _____)

Written

B. ALTERNATE BIDS

The stated Lump Sum Alternate Bids include all work and material required to complete the stated portion of work.

1. ALTERNATE NUMBER ONE - (Gym Cooling) _____

(ADD) _____

_____ (\$ _____)

2. ALTERNATE NUMBER TWO - (Weight Room) _____

(ADD) _____

_____ (\$ _____)

3. ALTERNATE NUMBER THREE - (Sensory Lighting) _____

(ADD) _____

_____ (\$ _____)

4. ALTERNATE NUMBER FOUR - (Screen Wall) _____

(ADD) _____

_____ (\$ _____)

5. ALTERNATE NUMBER FIVE - (West Lawn Outdoor Seating) _____

(ADD) _____

_____ (\$ _____)

6. ALTERNATE NUMBER SIX – (Discus and Multi-Purpose Field Practice Area)

(ADD) _____

_____ (\$ _____)

Exclusions

Bidders must clearly disclose any exclusions in their Bid. Exclusions should be explicitly identified, detailed, and tied to specific drawings or specifications, with any resulting cost, schedule, or coordination impacts noted; anything not listed will be assumed as in compliance with project specifications and construction documents.

UNIT PRICES

The contractor is responsible for contract quantities and bids for a completed project as indicated on the drawings and specifications regardless of the accuracy of the estimated quantities given on the Construction Documents. The bidder is cautioned to insure that all costs are covered in his bid as no additions shall be made to the contract due to errors in the estimated quantities.

Unit prices shall be for the items furnished and installed according to the drawings and specifications. Unit price is defined as the in-place cost per unit quantity of work either in excess of or less than the scope indicated in the Contract Documents. It shall include installation, materials, delivery, overhead, profit, and all other related expenses.

In the event of approved Change Orders during the contract, the unit prices shall be used to establish any increase or decrease of the contract amount.

COMPANY NAME: [Enter firm name](#)

BIDDING AS A:

Are you submitting this bid as a Wyoming Resident Contractor?

☐ No

☐ Yes, and my Contractor Residency Certification Number is _____, and my bid complies with Wyoming Statute 16-6-103. The project will be awarded based on the Contractor's statement of meeting the requirements of Wyoming Statute 16-6-103. Subsequent information verifying the statute requirements have been met will be required up to and including possible audits. The audit is to confirm that the contractor has not subcontracted more than a total of 30% of the work covered by his contract to non-resident proposed subcontractors. (Certificate of Residency must be current and on file with the State of Wyoming Department of Employment, Labor Standards Division (307) 777-7261. **Please do not check this box if you have subcontracted 30% or more to out of state firms.**

Apprenticeship Utilization Program (W.S. 16-6-901 - 16-6-902).

"For all public works awarded by the State of Wyoming, the University of Wyoming, a community college or a school district pursuant to W.S. 16-6-101 through 16-6-206 estimated to cost one million dollars (\$1,000,000.00) or more, a contractor who commits to ensure that not less than ten percent (10%) of the labor hours shall be worked by apprentices shall have his bid considered as if his bid were one percent (1%) lower than the actual dollar value of his bid."

The Apprenticeship Utilization Program allows for a One percent (1%) bid preference on all public works projects costing over \$1,000,000.00.

If contractors elect to invoke the bid preference on this project, additional paperwork will be submitted with the bid package.

For example, if electing the preference, the contractor will submit a Letter of Certification stating the Apprenticeship Program is approved by and registered with the U.S. Department of Labor, Wyoming's Bureau of Apprenticeship and Training with the bid documents. Bids may then be considered as if they were one percent (1%) lower than the actual face value.

Are you requesting bid preference for having an Apprenticeship Utilization Program in place?

☐ Yes ☐ No

If yes, you must attach the appropriate documentation with your bid.

COMPANY NAME: [Enter firm name](#)

The undersigned, pursuant to the Invitation to Bid, and all other bidding requirements, being familiar with existing conditions, the site and other local conditions affecting the cost and performance of the work, hereby proposes and agrees to perform all work including labor, materials, services, etc. in strict accordance with the Contract Documents.

SIGNATURE

Signature of Bidder: _____

Typed Name and Title: _____

Name of Company: _____

Company Organization: _____
(Individual, Partnership, Corporation)

Incorporated in the State of _____

How many years has the organization been in business as a contractor? _____

Under what other or former names has your organization operated? _____

Date of organization or incorporation under the present name: _____

Names of other partners or officers: _____

Company Address: _____

(City / State / ZIP Code)

Company Telephone Number: (_____) _____

Company Fax Number: (_____) _____

Company / Contact E-mail Address: _____

COMPANY NAME: [Enter firm name](#)

ATTACHMENTS REQUIRED AT BID OPENING

1. Completed Bid Form
2. Bid Security (required if bid exceeds \$150,000.00)
3. Project Managers Resume
4. Resident Certificates for Bidders and Subcontractors
5. Schedule
6. Alternate Pricing

ATTACHMENT REQUIRED IF REQUESTED BY THE ARCHITECT

1. Company Financials

BID FORM CHECKLIST

1. Bid is signed
2. Bidder's name appears on each page of the Bid Form
3. Bid Security in the amount of 10% is attached
4. Addendum acknowledged
5. Residency status indicated
6. Apprenticeship program participation indicated

END OF BID FORM REQUIREMENTS SECTION

CONTRACT

FOR DESIGN BID BUILD CONTRACTOR SERVICES

Contract Documents
Design Bid Build (D.B.B.) Contractor Services

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Design, Bid, Build

Agreement

Exhibit A - Certificate of Insurance and Payment and Performance Bonds

Notice to Proceed

SECTION 00 43 36 - OFFICIAL PROPOSED SUBCONTRACTORS FORM
Completely fill in the information requested below even if you are self-performing the work, place the information where required. Any portion of the form not filled in will be considered incomplete and an irregularity, and may effect the award of the bid.

PROJECT:
Campbell County School District - Phase III-V
1000 Camel Drive
Gillette, WY 82717

Architect of Record
Plan 1
225 W Yellowstone Ave, Suite 4
Cody WY, 82414

Design Architect
DLR Group
1401 Lawrence Street, Suite 100
Denver, CO 80202

Date: Project Number:

Contractor:

DO NOT COMBINE DIVISIONS OF WORK; LIST SEPARATELY AS REQUESTED.

Description of Work	IN STATE SUBCONTRACTOR'S OR SUPPLIER'S NAME,	AMOUNT	OUT OF STATE SUBCONTRACTOR'S OR SUPPLIER'S NAME,	AMOUNT
Division 01 - General Conditions				
Division 02 - Existing Conditions				
DIVISION 3 - CONCRETE				
DIVISION 4 - MASONRY				
DIVISION 5 - METALS				
DIVISION 6 - WOOD, PLASTICS, COMPOSITES				
DIVISION 7 - THERMAL/MOISTURE PROTECTION				
DIVISION 8 - OPENINGS				
DIVISION 9 - FINISHES				
DIVISION 10 - SPECIALTIES				
DIVISION 11 - EQUIPMENT				
DIVISION 12 - FURNISHINGS				
DIVISION 21 - FIRE SUPPRESSION				
DIVISION 22 - PLUMBING				
DIVISION 23 - HVAC				
DIVISION 26 - ELECTRICAL				
DIVISION 27 - COMMUNICATIONS				
DIVISION 28 - ELECTRICAL SAFETY/SECURITY				
DIVISION 31 - EARTHWORK				
DIVISION 32 - EXTERIOR IMPROVEMENTS				
DIVISION 33 - UTILITIES				

	\$ 0.00	\$ 0.00
Total Bid (Including OH&P)	\$ -	

Agreement

CONSTRUCTION AGREEMENT BETWEEN

Campbell County School District

AND

Contractor Name

WITH THE WYOMING STATE CONSTRUCTION DEPARTMENT,

SCHOOL FACILITIES DIVISION

AS A THIRD PARTY BENEFICIARY OF THE AGREEMENT

FOR THE CONSTRUCTION OF

Campbell County High School

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This Agreement is made by and between **Campbell County School District**, hereinafter referred to as "District," and **Contractor Name**, hereinafter referred to as "Contractor," with the Wyoming State Construction Department (SCD), School Facilities Division (SFD), 700 West 21st Street, Cheyenne, Wyoming, 82002, hereinafter referred to as "SFD," as a third party beneficiary of the Agreement.

The District, Contractor, and the SFD in consideration of the mutual covenants herein set forth, agree as follows:

ARTICLE 1, GENERAL TERMS

1.1 Interested Parties:

1.1.1 **"Owner:"** The "Owner" referred to in this Agreement is the **Campbell County School district 1000, W. 8th Street, Gillette, WY** (District), as the primary contracting party, and the Wyoming State Construction Department (SCD), School Facilities Division (SFD) as a signatory indicating its approval of the form of this Agreement and pursuant to the execution of its statutory responsibilities and as a claimant of third party beneficiary rights hereunder. The SCD is an agency of the State of Wyoming with governance over the design specifications and funding for the capital construction project that is the subject of this Agreement. Significant funding for this Project will be provided by the SCD. Approval of the SCD is required by Wyoming law for significant portions of the responsibilities assigned to the "Owner" by the contract documents. To facilitate the relationship established by law between the District and the SCD, all references to "Owner" in this Agreement shall be read to include the District and the SCD in their respective capacities in the exercise of the powers and responsibilities granted to the District in cooperation with and upon the approval of the SCD. References to the District herein shall include the Board of Trustees and administration of the District and references to the SCD herein shall include the Department as well as all SCD planning, design and construction staff and administration.

1.1.2 **"Contractor:"** The "General Contractor" referred to in this Agreement is **Contractor Name, Enter Contractor's Address.**

1.1.3 **"Architect:"** The "Architect" referred to in this Agreement is **Mayraj Sayad Peer**, AIA, Principal and the firm of **DLR Group, 1401 Lawrence St. Ste. 100, Denver, Co 80202.**

1.2 **Scope of the Project:** The General Contractor shall furnish construction services in connection with the scope of the Project described generally as **Campbell County High School.**

1.3 **Contract Documents:** Owner and the General Contractor agree that the Contract Documents for the Project shall consist of this Agreement and the following documents incorporated into and made a part of this Agreement, and are as fully a part of the Agreement as if attached to this Agreement or repeated herein, to-wit:

1.3.1 Certificate of Insurance and Payment and Performance Bonds to be attached hereto as Exhibit A.

1.3.2 Any amendments or modifications of this Agreement made after execution of this Agreement.

1.3.3 The Project Drawings, Specifications and Addenda, and related bid documents, pre-qualification submittals, accounting and construction documents to include but not be limited to Schedule of Values.

1.4 **Definitions:** Definitions of terms used in this Agreement and wherever used in the Contract Documents and printed with initial or all capital letters, the terms listed below will have the meanings indicated which are applicable to both the singular and plural thereof.

- 1.4.1 Addenda - Written or graphic instruments issued prior to the opening of Bids which clarify, correct, or change the Bidding Requirements or the Contract Documents.
- 1.4.2 Agreement or Contract - The written instrument which is evidence of the agreement between Owner and Contractor covering the Work.
- 1.4.3 Application for Payment - The form acceptable to Architect or Owner's representative which is to be used by Contractor during the course of the Work in requesting progress or final payments and which is to be accompanied by such supporting documentation as is required by the Contract Documents.
- 1.4.4 Architect - The individual or entity named as such in the Agreement. The term Architect as used herein includes both professional architects and engineers.
- 1.4.5 Architect's Consultant - An individual or entity having a contract with Architect to furnish services as Architect's independent professional associate or consultant with respect to the Project and who is identified as such in the Contract Documents, if any.
- 1.4.6 Asbestos - Asbestos Containing Material (ACM) when referring to school buildings means any material or product which contains more than 1 percent asbestos as recognized by the Environmental Protection Agency (EPA).
- 1.4.7 Bid - The offer or proposal of a bidder submitted on the prescribed form setting forth the prices for the Work to be performed.
- 1.4.8 Bidding Document - The Bidding requirements and the proposed Contract Documents (including all Addenda issued prior to receipt of Bids).
- 1.4.9 Bidding Requirements - The Advertisement or Invitation to Bid, Instructions to Bidders, Bid security form, if any, and the Bid form with any supplements.
- 1.4.10 Bonds - Performance and payment bonds and other instruments of security.
- 1.4.11 Change Order - A document recommended by Architect which is signed by General Contractor, Owner and Architect, and authorizes an addition, deletion, or revision in the Work or an adjustment in the Contract Price or the Contract Times, issued on or after the Effective Date of the Agreement.
- 1.4.12 Claim - A demand or assertion by Owner or General Contractor seeking an adjustment of Contract Price or Contract Times, or both, or other relief with respect to the terms of the Contract. A demand for money or services by a third party is not a Claim.
- 1.4.13 Contract or Agreement - The entire and integrated written agreement between Owner and Contractor concerning the Work. The Contract supersedes prior negotiations, representations, or agreements, whether written or oral.
- 1.4.14 Contract Documents - The Contract Documents establish the rights and obligations of the parties and include the Agreement, Addenda (which pertain to the Contract Documents), General Contractor's Bid (including documentation accompanying the Bid and any post Bid documentation submitted prior to the Notice of Award), and any Notice to Proceed, Bonds, Supplementary Conditions, Specifications and the Drawings as the same are more specifically identified in the Agreement, together with all Written Amendments, Change Orders, and Architect's or Owner's representative written interpretations and clarifications issued on or after the Effective Date of the Agreement. Approved Shop Drawings and the reports and drawings of subsurface and physical conditions are not Contract Documents. Contract Documents may be prepared and provided in printed or electronic media format of text, data, graphics, and the like, as determined for each project by the Owner.

1.4.15 Contract Price - The moneys payable by Owner to Contractor for completion of the Work in accordance with the Contract Documents as stated in the Agreement (subject to the provisions modification for Unit Price Work).

1.4.16 Contract Times - The number of days or the dates stated in the Agreement to: (i) achieve Substantial Completion; and (ii) complete the Work so that it is ready for final payment as evidenced by Architect's or Owner's representative's written recommendation of final payment.

1.4.17 Contractor - The individual or entity with whom Owner has entered into the Agreement.

1.4.18 Cost of the Work - The sum of all costs necessarily incurred and paid by Contractor in the proper performance of the Work. When the value of any Work covered by a Change Order or when a Claim for an adjustment in Contract Price is determined on the basis of Cost of the Work, the costs to be reimbursed to Contractor will be only those additional or incremental costs required because of the change in the Work or because of the event giving rise to the Claim.

1.4.19 Day or Days – A calendar day or calendar days.

1.4.20 Drawings - That part of the Contract Documents prepared or approved by Architect which graphically shows the scope, extent, and character of the Work to be performed by Contractor. Shop Drawings and other Contractor submittals are not Drawings as so defined.

1.4.21 Effective Date of the Agreement - The date indicated in the Agreement on which it becomes effective, but if no such date is indicated, it means the date on which the Agreement is signed and delivered by the last party to sign and deliver.

1.4.22 Field Order - A written order issued by Architect which requires minor changes in the Work but which does not involve a change in the Contract Price or the Contract Times.

1.4.23 General Requirements - The General Requirements pertain to all sections of the Specifications.

1.4.24 Hazardous Environmental Condition - The presence at the Site of Asbestos, PCBs, Petroleum, Hazardous Waste, or Radioactive Material in such quantities or circumstances that may present a substantial danger to persons or property exposed thereto in connection with the Work.

1.4.25 Hazardous Waste - The term Hazardous Waste shall have the meaning provided in Section 1004 of the Solid Waste Disposal Act (42 USC Section 6903) as amended from time to time or other laws.

1.4.26 Laws or Regulations - Any and all applicable laws, rules, regulations, ordinances, codes, and orders of any and all governmental bodies, agencies, authorities, and courts having jurisdiction of the State of Wyoming and/or United States of America.

1.4.27 Liens - Charges, security interests, or encumbrances upon Project funds, real property, or personal property.

1.4.28 Material - All things of all kind whatsoever whether ancient or modern found or discovered on, under or around the Site including, without limitation, minerals, metals, objects, articles, scrap, cable and wire, plant, equipment and vehicles.

1.4.29 Milestone - A principal event specified in the Contract Documents relating to an intermediate completion date or time prior to Substantial Completion of all the Work.

1.4.30 Notice to Proceed - A written notice given by Owner to Contractor fixing the date on which the Contract Times will commence to run and on which Contractor shall start to perform the Work under the Contract Documents.

1.4.31 Owner's Project Representative - The authorized representative of Owner who may be assigned to the Site or any part thereof.

1.4.32 Partial Utilization or Partial Occupancy - Use by Owner of a substantially completed part of the Work for the purpose for which it is intended (or a related purpose) prior to Substantial Completion of all the Work.

1.4.33 PCBs--Polychlorinated biphenyls.

1.4.34 Petroleum - Petroleum, including crude oil or any fraction thereof which is liquid at standard conditions of temperature and pressure (60 degrees Fahrenheit and 14.7 pounds per square inch absolute), such as oil, petroleum, fuel oil, oil sludge, oil refuse, gasoline, kerosene, and oil mixed with other non-Hazardous Waste and crude oils.

1.4.35 Project - The total construction of which the Work to be performed under the Contract Documents may be the whole, or a part as may be indicated elsewhere in the Contract Documents.

1.4.36 Project Manual -The bound documentary information prepared for bidding and constructing the Work. A listing of the contents of the Project Manual, which may be bound in one or more volumes, is contained in the table(s) of contents.

1.4.37 Radioactive Material - Source, special nuclear, or byproduct material as defined by the Atomic Energy Act of 1954 (42 USC Section 2011 et seq.) as amended from time to time.

1.4.38 Samples - Physical examples of materials, equipment, or workmanship that are representative of some portion of the Work and which establish the standards by which such portion of the Work will be judged.

1.4.39 Shop Drawings - All drawings, diagrams, illustrations, schedules, and other data or information which are specifically prepared or assembled by or for Contractor and submitted by Contractor to illustrate some portion of the Work.

1.4.40 Site - Lands or areas indicated in the Contract Documents as being furnished by Owner upon which the Work is to be performed, including rights-of-way and easements for access thereto, and such other lands furnished by Owner which are designated for the use of Contractor.

1.4.41 Specifications - That part of the Contract Documents consisting of written technical descriptions of materials, equipment, systems, standards, and workmanship as applied to the Work and certain administrative details applicable thereto.

1.4.42 Subcontractor - An individual or entity having a direct contract with Contractor or with any other Subcontractor for the performance of a part of the Work at the Site.

1.4.43 Substantial Completion - The time at which the Work (or a specified part thereof) has progressed to the point where, in the opinion of Architect, the Work is sufficiently complete, in accordance with the Contract Documents, so that the Work (or a specified part thereof) can be utilized for the purposes for which it is intended. The terms "substantially complete" and "substantially completed" as applied to all or part of the Work refer to Substantial Completion thereof.

1.4.44 Supplementary Conditions - That part of the Contract Documents which amends or supplements this Agreement, if any.

1.4.45 Supplier - A manufacturer, fabricator, supplier, distributor, materialman, or vendor having a direct contract with Contractor or with any Subcontractor to furnish materials or equipment to be incorporated in the Work by Contractor or any Subcontractor.

1.4.46 Underground Facilities - All underground pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or attachments, and any encasements containing such facilities, including those that convey electricity, gases, steam, liquid petroleum products, telephone or other communications, cable television, water, wastewater, storm water, other liquids or chemicals, or traffic or other control systems.

1.4.47 Unit Price Work - Work to be paid for on the basis of unit prices.

1.4.48 Work - The entire construction or the various separately identifiable parts thereof required to be provided under the Contract Documents. Work includes and is the result of performing or providing all labor, services, and documentation necessary to produce such construction, and furnishing, installing, and incorporating all materials and equipment into such construction, all as required by the Contract Documents.

1.4.49 Work Change Directive - A written statement to Contractor issued on or after the Effective Date of the Agreement and signed by Owner upon recommendation of the Architect ordering an addition, deletion, or revision in the Work, or responding to differing or unforeseen subsurface or physical conditions under which the Work is to be performed or to emergencies. A Work Change Directive will not change the Contract Price or the Contract Times but is evidence that the parties expect that the change ordered or documented by a Work Change Directive will be incorporated in a subsequently issued Change Order following negotiations by the parties as to its effect, if any, on the Contract Price or Contract Times.

1.4.50 Written Amendment - A written statement modifying the Contract Documents, signed by Owner, Contractor, and Architect or Owner's representative on or after the Effective Date of the Agreement and normally dealing with the non-Architecting or non-technical rather than strictly construction-related aspects of the Contract Documents.

1.5 Terminology: Generally, unless stated otherwise in the Contract Documents, words or phrases which have a well-known technical or construction industry or trade meaning are used in the Contract Documents in accordance with such recognized meaning subject to the following:

1.5.1 Intent of Certain Terms or Adjectives - Whenever in the Contract Documents the terms "as allowed," "as approved," or terms of like effect or import are used, or the adjectives "reasonable," "suitable," "acceptable," "proper," "satisfactory," or adjectives of like effect or import are used to describe an action or determination of Architect as to the Work, it is intended that such action or determination will be solely to evaluate, in general, the completed Work for compliance with the requirements of and information in the Contract Documents and conformance with the design concept of the completed Project as a functioning whole as shown or indicated in the Contract Documents (unless there is a specific statement indicating otherwise). The use of any such term or adjective shall not be effective to assign to Architect any duty or authority to supervise or direct the performance of the Work or any duty or authority to undertake responsibility contrary to the provisions of the Contract Documents.

1.5.2 Day - The word "day" shall constitute a calendar day of 24 hours measured from midnight to the next midnight.

1.5.3 Defective - The word "defective," when modifying the word "Work," refers to Work that is unsatisfactory, faulty, or deficient in that it does not conform to the Contract Documents or does not meet the requirements of any inspection, reference standard, test, or approval referred to in the Contract Documents, or has been damaged prior to Architect's recommendation of final payment (unless responsibility for the protection thereof has been assumed by Owner at Substantial Completion in accordance with the terms of the Contract Documents).

1.5.4 Furnish, Install, Perform, Provide

1.5.4.1 The word "furnish," when used in connection with services, materials, or equipment, shall mean to supply and deliver said services, materials, or equipment to the Site (or some other specified location) ready for use or installation and in usable or operable condition.

1.5.4.2 The word "install," when used in connection with services, materials, or equipment, shall mean to put into use or place in final position said services, materials, or equipment complete and ready for intended use.

1.5.4.3 The words "perform" or "provide," when used in connection with services, materials, or equipment, shall mean to furnish and install said services, materials, or equipment complete and ready for intended use.

1.5.4.4 When "furnish," "install," "perform," or "provide" is not used in connection with services, materials, or equipment in a context clearly requiring an obligation of Contractor, "provide" is implied.

ARTICLE 2, THE WORK OF THIS CONTRACT

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

ARTICLE 3, CONTRACT SUM

3.1 Bid Contract Sum: Owner shall pay Contractor the Contract Sum for Contractor's performance of the Contract. The Contract Sum shall be a base bid of **Written Dollar Amount DOLLARS AND 00/100 (\$Numeric Dollar Amount)**, subject to additions by alternates or additions and deductions as provided in the Contract Documents. This Contract Sum shall represent the Total Construction and Renovation Cost for the Project.

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

3.3 Total Contract Sum: The Total Contract Sum including the Bid Contract Sum, accepted alternates and unit priced materials and labor is **Written Dollar Amount DOLLARS AND 00/100 (\$Numeric Dollar Amount)**.

ARTICLE 4, BONDS AND INSURANCE

4.1 Performance, Payment, and Other Bonds:

4.1.1 Contractor shall furnish performance and payment Bonds, each in an amount equal to the Contract Sum as security for the faithful performance and payment of all Contractor's obligations under the Contract Documents. These Bonds shall remain in effect at least until one year after the date when final payment becomes due, except as provided otherwise by Laws or Regulations or by the Contract Documents. Contractor shall also furnish such other Bonds as are required by the Contract Documents.

4.1.2 All Bonds shall be in the form prescribed by the Contract Documents except as provided otherwise by Laws or Regulations, and shall be executed by such sureties as are named in the current list of "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Circular 570 (amended) by the Financial Management Service, Surety Bond Branch, U.S. Department of the Treasury. All Bonds signed by an agent must be accompanied by a certified copy of such agent's authority to act.

4.1.3 If the surety on any Bond furnished by Contractor is declared bankrupt or becomes insolvent or its right to do business is terminated in any state where any part of the Project is located or it ceases to meet the requirements of paragraph 4.1.2 above, Contractor shall within twenty (20) days thereafter substitute another Bond and surety, both of which shall comply with the requirements of paragraphs 4.1 and 4.2 hereof.

4.2 Licensed Sureties and Insurers: All Bonds and insurance required by the Contract Documents to be purchased and maintained by Owner or Contractor shall be obtained from surety or insurance companies that are duly licensed or authorized in the jurisdiction in which the Project is located to issue Bonds or insurance policies for the minimum limits and coverages as required on the table below; policy limits and coverages may be increased pursuant to the provisions of the Supplementary Conditions. Such surety and insurance companies shall also meet such additional requirements and qualifications as may be provided herein.

<i>Insurance Required</i>	<i>Level of Coverage – Determined by Contract Amount</i>			
<i>Contract Amount</i>	<i>\$0 - \$100,000</i>	<i>\$100,000 to \$250,000</i>	<i>\$250,000 to \$500,000</i>	<i>\$500,000 plus</i>
Workers' Compensation	Required Statutory Limits	Required Statutory Limits	Required Statutory Limits	Required Statutory Limits
Commercial General Liability	\$1,000,000 per occurrence; and \$1,000,000 aggregate	\$1,000,000 per occurrence; and \$1,000,000 aggregate	\$1,000,000 per occurrence; and \$2,000,000 aggregate	\$1,000,000 per occurrence; and \$2,000,000 aggregate
Excess Liability	\$2,000,000	\$2,000,000	\$2,000,000	\$5,000,000
Property (Builder's Risk) Insurance	Amount of the full replacement or repair cost of structures located thereon not subject to demolition and clearance and cost of proper disposal and removal of debris with a deductible amount no greater than \$5,000.	Amount of the full replacement or repair cost of structures located thereon not subject to demolition and clearance and cost of proper disposal and removal of debris with a deductible amount no greater than \$5,000.	Amount of the full replacement or repair cost of structures located thereon not subject to demolition and clearance and cost of proper disposal and removal of debris with a deductible amount no greater than \$5,000.	Amount of the full replacement or repair cost of structures located thereon not subject to demolition and clearance and cost of proper disposal and removal of debris with a deductible amount no greater than \$5,000.
Automobile Liability	\$1,000,000 per occurrence	\$1,000,000 per occurrence	\$1,000,000 per occurrence	\$1,000,000 per occurrence

4.3 Certificates of Insurance: Contractor shall deliver to Owner, with copies to each additional insured identified herein, certificates of insurance (and other evidence of insurance requested by Owner or any other additional insured) which Contractor is required to purchase and maintain. Owner shall deliver to Contractor, with copies to each additional insured identified herein, certificates of insurance (and other evidence of insurance requested by Contractor's or any other additional insured) which Owner is required to purchase and maintain.

4.4 Contractor's Liability Insurance: Contractor shall purchase and maintain such liability and other insurance that meets the insurance requirement set forth in the contract documents for the Work being performed and as will provide protection from claims set forth below which may arise out of or result from Contractor's performance of the Work and Contractor's other obligations under the Contract Documents, whether it is to be performed by Contractor, any Subcontractor or Supplier, or by anyone directly or indirectly employed by any of them to perform any of the Work, or by anyone for whose acts any of them may be liable:

4.4.1 Claims under workers' compensation, disability benefits, and other similar employee benefit acts;

4.4.2 Claims for damages because of bodily injury, occupational sickness or disease, or death of Contractor's employees;

4.4.3 Claims for damages because of bodily injury, sickness or disease, or death of any person other than Contractor's employees;

4.4.4 Claims for damages insured by reasonably available personal injury liability coverage which are sustained: (i) by any person as a result of an offense directly or indirectly related to the employment of such person by Contractor, or (ii) by any other person for any other reason.

4.4.5 Claims for damages, other than to the Work itself, because of injury to or destruction of tangible property wherever located, including loss of use resulting therefrom; and,

4.4.6 Claims for damages because of bodily injury or death of any person or property damage arising out of Ownership, maintenance or use of any motor vehicle.

4.5 Additional Insured: The policies of insurance so required by paragraph 4.4 to be purchased and maintained shall:

4.5.1 With respect to insurance required by paragraph 4.4, include as additional insured Owner, Architect, Architect's Consultants, and any other individuals or entities identified herein, all of whom shall be listed as additional insured, and include coverage for the respective officers, directors, partners, employees, agents, and other consultants and subcontractors of each and any of all such additional insured, and the insurance afforded to these additional insured shall provide primary coverage for all claims covered thereby;

4.5.2 Include at least the specific coverages and be written for not less than the limits of liability provided in this Agreement or required by Laws or Regulations, whichever is greater;

4.5.3 Include completed operations insurance;

4.5.4 Include contractual liability insurance covering Contractor's indemnity obligations;

4.5.5 Contain a provision or endorsement that the coverage afforded will not be canceled, materially changed or renewal refused until at least 30 days prior written notice has been given to Owner, Architect and Contractor and to each other additional insured identified in this Agreement to whom a certificate of insurance has been issued (and the certificates of insurance furnished by Contractor pursuant to paragraph 4.3 will so provide);

4.5.6 Remain in effect at least until final payment and at all times thereafter when Contractor may be correcting, removing, or replacing defective Work in accordance; and

4.5.7 With respect to completed operations insurance, and any insurance coverage written on a claims-made basis, remain in effect for at least two years after final payment (and Contractor shall furnish Owner and each other additional insured identified herein to whom a certificate of insurance has

been issued, evidence satisfactory to Owner and any such additional insured of continuation of such insurance at final payment and one year thereafter).

4.6 Owner's Liability Insurance: In addition to the insurance required to be provided by Contractor under this Article 4, Owner, at Owner's option, may purchase and maintain at Owner's expense Owner's own liability insurance as will protect Owner against claims which may arise from operations under the Contract Documents.

4.7 Property Insurance:

4.7.1 Unless otherwise provided in this Agreement, Contractor shall purchase and maintain property insurance upon the Work at the Site in the amount of the full replacement cost thereof (subject to such deductible amounts as may be provided in this Agreement or required by Laws and Regulations). This insurance shall:

4.7.1.1 Include the interests of Owner, Contractor, Subcontractors, Architect, Architect's Consultants, and any other individuals or entities identified in this Agreement, and the officers, directors, partners, employees, agents, and other consultants and subcontractors of each and any of them, each of whom is deemed to have an insurable interest and shall be listed as an additional insured;

4.7.1.2 Be written on a Builder's Risk "all-risk" or open peril or special causes of loss policy form that shall at least include insurance for physical loss or damage to the Work, temporary buildings, false work, and materials and equipment in transit, and shall insure against at least the following perils or causes of loss: fire, lightning, extended coverage, theft, vandalism and malicious mischief, earthquake, collapse, debris removal, demolition occasioned by enforcement of Laws and Regulations, water damage, and such other perils or causes of loss as may be specifically required by this Agreement, with the Contractor being responsible for payment of any deductibles;

4.7.1.3 Include expenses incurred in the repair or replacement of any insured property (including but not limited to fees and charges of engineers and architects);

4.7.1.4 Cover materials and equipment stored at the Site or at another location that was agreed to in writing by Owner prior to being incorporated in the Work, provided that such materials and equipment have been included in an Application for Payment recommended by Architect;

4.7.1.5 Allow for partial utilization of the Work by Owner;

4.7.1.6 Include testing and startup;

4.7.1.7 Be maintained in effect until final payment is made unless otherwise agreed to in writing by Owner, Contractor, and Architect with thirty (30) days written notice to each other additional insured to whom a certificate of insurance has been issued; and

4.7.1.8 Contain a provision or endorsement that the coverage afforded will not be canceled or materially changed or renewal refused until at least thirty (30) days prior written notice has been given to Owner and Contractor and to each other additional insured to whom a certificate of insurance has been issued and will contain waiver provisions in accordance with paragraph 4.7.

4.7.2 Contractor shall purchase and maintain such boiler and machinery insurance or additional property insurance as may be required by this Agreement or Laws and Regulations which will include the interests of Owner, Contractor, Subcontractors, Architect, Architect's Consultants, and any other individuals or entities identified in this Agreement, each of whom is deemed to have an insurable interest and shall be listed as an insured or additional insured.

4.7.3 Owner shall not be responsible for purchasing and maintaining any property insurance specified

in this paragraph to protect the interests of Contractor, Subcontractors, or others in the Work to the extent of any deductible amounts that are identified in this Agreement. The risk of loss within such identified deductible amount will be borne by Contractor, Subcontractors, or others suffering any such Loss, and if any of them wishes property insurance coverage within the limits of such amounts, each may purchase and maintain it at the purchaser's own expense.

4.8 Waiver of Rights: Owner and Contractor intend that all policies for Property Insurance only purchased in accordance with 4.7 will protect Owner, Contractor, Subcontractors, Architect, Engineer's Consultants, and all other individuals or entities identified in this Agreement to be listed as insured or additional insured (and the officers, directors, partners, employees, agents, and other consultants and subcontractors of each and any of them) in such policies and will provide primary coverage for all losses and damages caused by the perils or causes of loss covered thereby. All such policies shall contain provisions to the effect that in the event of payment of any loss or damage the insurers will have no rights of recovery against any of the insured or additional insured thereunder. Owner and Contractor waive all rights against each other and their respective officers, directors, partners, employees, agents, and other consultants and subcontractors of each and any of them for all losses and damages caused by, arising out of or resulting from any of the perils or causes of loss covered by such policies and any other property insurance applicable to the Work; and, in addition, waive all such rights against Subcontractors, Architect, Architect's Consultants, and all other individuals or entities identified in this Agreement to be listed as insured or additional insured (and the officers, directors, partners, employees, agents, and other consultants and subcontractors of each and any of them) under such policies for losses and damages so caused. None of the above waivers shall extend to the rights that any party making such waiver may have to the proceeds of insurance held by Owner as trustee or otherwise payable under any policy so issued.

4.9 Receipt and Application of Insurance Proceeds:

4.9.1 Any insured loss under the policies of insurance for Property Insurance only purchased in accordance with 4.7 will be adjusted with Contractor and made payable to Contractor as fiduciary for the insured, as their interests may appear, subject to the requirements of any applicable mortgage clause and of paragraph 4.9.2 shall deposit in a separate account any money so received and shall distribute it in accordance with such agreement as the parties in interest may reach. If no other special agreement is reached, the damaged Work shall be repaired or replaced, the moneys so received applied on account thereof, and the Work and the cost thereof covered by an appropriate Change Order or Written Amendment.

4.9.2 Contractor as fiduciary shall have power to adjust and settle any loss with the insurers unless one of the parties in interest shall object in writing within fifteen (15) days after the occurrence of loss to Contractor's exercise of this power. If such objection be made, Contractor as fiduciary shall make settlement with the insurers in accordance with such agreement as the parties in interest may reach. If no such agreement among the parties in interest is reached, Contractor as fiduciary shall adjust and settle the loss with the insurers and, if required in writing by any party in interest, Contractor as fiduciary shall give bond for the proper performance of such duties.

4.10 Acceptance of Bonds and Insurance; Option to Replace: If either Owner or Contractor has any objection to the coverage afforded by or other provisions of the Bonds or insurance required to be purchased and maintained by the other party in accordance with Article 4 on the basis of non-conformance with the Contract Documents, the objecting party shall so notify the other party in writing within ten (10) days after receipt of the certificates of insurance required herein (or other evidence requested). Owner and Contractor shall each provide to the other such additional information in respect of insurance provided as the other may reasonably request. If either party does not purchase or maintain all of the Bonds and insurance required of such party by the Contract Documents, such party

shall notify the other party in writing of such failure to purchase prior to the start of the Work, or of such failure to maintain prior to any change in the required coverage. Without prejudice to any other right or remedy, the other party may elect to obtain equivalent Bonds or insurance to protect such other party's interests at the expense of the party who was required to provide such coverage, and a Change Order shall be issued to adjust the Contract Price accordingly.

4.11 Partial Utilization, Acknowledgment of Property Insurer: If Owner finds it necessary to occupy or use a portion or portions of the Work prior to Substantial Completion of all the Work, no such use or occupancy shall commence before the insurers providing the property insurance pursuant to paragraph 4.7 have acknowledged notice thereof and in writing effected any changes in coverage necessitated thereby. The insurers providing the property insurance shall consent by endorsement on the policy or policies, but the property insurance shall not be canceled or permitted to lapse on account of any such partial use or occupancy.

ARTICLE 5, PRELIMINARY MATTERS

5.1 Delivery of Insurance and Payment and Performance Bonds: Contractor shall deliver to Owner Insurance and Payment and Performance Bonds to be attached hereto as **Exhibit A**.

5.2 Copies of Documents: Owner has made available to Contractor the Contract Documents in electronic PDF via the SFD website, Questcdn.com link. Contractor may download information from this site for his use and to produce additional sets of documents.

Upon award of a contract for construction to a contractor the Architect shall pay for, coordinate printing, and distribute the final set of contract documents bearing the seal and the signature of the Architect/Engineer to the perspective parties as listed in the table.

PROJECT TYPE	DISTRICT	SCHOOL FACILITIES DIVISION	GENERAL CONTRACTOR
Component	3- Full Size Sets of Plans 3- Half Size Sets of Plans 3- Sets of Specifications	1- Full Size Sets of Plans 1- Half Size Sets of Plans 1- Sets of Specifications	10- Full Size Sets of Plans 10- Half Size Sets of Plans 10- Sets of Specifications
Elementary School	3- Full Size Sets of Plans 3- Half Size Sets of Plans 3- Sets of Specifications	1- Full Size Sets of Plans 1- Half Size Sets of Plans 1- Sets of Specifications	30- Full Size Sets of Plans 30- Half Size Sets of Plans 30- Sets of Specifications
Middle School	3- Full Size Sets of Plans 3- Half Size Sets of Plans 3- Sets of Specifications	1- Full Size Sets of Plans 1- Half Size Sets of Plans 1- Sets of Specifications	40- Full Size Sets of Plans 40- Half Size Sets of Plans 40- Sets of Specifications
High School	3- Full Size Sets of Plans 3- Half Size Sets of Plans 3- Sets of Specifications	1- Full Size Sets of Plans 1- Half Size Sets of Plans 1- Sets of Specifications	50- Full Size Sets of Plans 50- Half Size Sets of Plans 50- Sets of Specifications

5.3 Commencement of Contract Times; Notice to Proceed: The term of this contract will commence on the date when the last required signature is affixed hereto. The Contract Times will commence to run on the date stated in the Notice to Proceed given by the Owner along with this Agreement.

5.4 Starting the Work: Contractor shall start to perform the Work on the date when the Contract Times commence to run as stated in the Notice to Proceed. No Work shall be done at the Site prior to the date on which the Contract Times commence to run.

5.5 Before Starting Construction:

5.5.1 Identification of Project Representatives: The project representatives for the Owner and Contractor shall be those persons identified below. All communications regarding the execution of the Contract shall be made through these identified project representatives.

Organization	Name of Representative	Position	Phone Number	E-Mail Address
SFD	Enter Rep Name	Enter Position Title	Enter Phone Number	Enter Email
School District	Enter Rep Name	Enter Position Title	Enter Phone Number	Enter Email
Architect	Enter Rep Name	Enter Position Title	Enter Phone Number	Enter Email
Contractor	Enter Rep Name	Enter Position Title	Enter Phone Number	Enter Email

5.5.2 Contractor's Review of Contract Documents: Before undertaking each part of the Work, Contractor shall carefully study and compare the Contract Documents and check and verify pertinent figures therein and all applicable field measurements. Contractor shall promptly report in writing to Architect any conflict, error, ambiguity, or discrepancy which Contractor may discover and shall obtain a written interpretation or clarification from Architect before proceeding with any Work affected thereby; however, Contractor shall not be liable to Owner or Architect for failure to report any conflict, error, ambiguity, or discrepancy in the Contract Documents unless Contractor knew or reasonably should have known thereof.

5.5.3 Preliminary Schedules: Within ten (10) business days of project award (unless otherwise specified in the General Requirements), Contractor shall submit to Architect for its timely review:

5.5.3.1 A preliminary progress schedule indicating the times (numbers of days or dates) for starting and completing the various stages of the Work, including any Milestones specified in the Contract Documents;

5.5.3.2 A preliminary schedule of Shop Drawings and Sample submittals which will list each required submittal and the times for submitting, reviewing, and processing such submittal; and

5.5.3.3 A preliminary Schedule of Values for all of the Work which includes quantities and prices of items which when added together equal the Contract Price and subdivide the Work into component parts in sufficient detail to serve as the basis for progress payments during performance of the Work. Such prices will include an appropriate amount of overhead and profit applicable to each item of Work. Accompanied with the Schedule of Values shall be a list of subcontractors who will be awarded each component of the work comprising the value of the Contract Price. The contractor shall not at any time substitute any subcontractor in place of any subcontractor listed as part of this requirement without the prior written permission of the Owner and Architect. The list shall identify which subcontractors are a Wyoming resident subcontract, or non-resident subcontractor and further illustrating that no less than 70% of the work comprising the value of the Contract Price will be awarded to Wyoming Resident

Subcontractors. The requirement of this clause may be waived in part upon a written determination that:

- (I) The work to be performed is specialized or of such a scale that it can be more suitably performed by out-of-state contractors;
- (II) The bid amounts submitted by responsible Wyoming subcontractors exceed one hundred five percent (105%) of the costs of out-of-state providers for equivalent quality of work or services;
- (III) The enforcement of the requirement would unreasonably delay completion of construction;
- (IV) There were insufficient responsible Wyoming contractors submitting bids to make the seventy percent (70%) requirement; or
- (V) If the requirement of this clause is waived in part, the remaining value of the total subcontract work to be performed for the project is subject to the requirement of clause 5.5.3.3;
- (VI) Any waiver of clause 5.5.3.3 shall be approved in writing by the director of the State Construction Department, School Facilities Division and the chairman of the board of the School Facilities Commission.

5.6 Evidence of Insurance: Before any Work at the Site is started, Contractor and Owner shall each deliver to the other, with copies to each additional insured identified in Article 4, certificates of insurance (and other evidence of insurance which either of them or any additional insured may reasonably request) which Contractor and Owner respectively are required to purchase and maintain in accordance with Article 4.

5.7 Preconstruction Conference: Before any Work at the Site is started, a conference attended by Contractor, Architect, Owner and others as appropriate will be held to establish a working understanding among the parties as to the Work and to discuss the preliminary schedules, procedures for handling Shop Drawings and other submittals, processing Applications for Payment including time-line for submission, review and payment, and maintaining required records.

5.8 Initial Acceptance of Schedules: At least ten (10) days before submission of the first Application for Payment a conference attended by Contractor, Architect, Owner and others as appropriate will be held to review for acceptability to Architect the preliminary schedules. Contractor shall have an additional ten days to make corrections and adjustments and to complete and resubmit the schedules. No progress payment shall be made to Contractor until acceptable schedules are submitted to Architect. With regard to the acceptability of the preliminary schedules by the Architect:

5.8.1 The progress schedule will be acceptable to Architect if it provides an orderly progression of the Work to completion within any specified Milestones and the Contract Times. Such acceptance will not impose on Architect responsibility for the progress schedule, for sequencing, scheduling, or progress of the Work nor interfere with or relieve Contractor from Contractor's full responsibility therefor.

5.8.2 Contractor's schedule of Shop Drawing and Sample submittals will be acceptable to Architect if it provides a workable arrangement for reviewing and processing the required submittals.

5.8.3 Contractor's Schedule of Values will be acceptable to Architect as to form and substance if it provides a reasonable allocation of the Contract Price to component parts of the Work.

5.9 Acknowledgment that Bid Based Upon Full Examination of Contract Documents: Contractor shall certify, warrant and represent to Owner that their bid is based on a full and complete examination of the Construction Documents, including as determined necessary site examination; and that all statements, facts and representations made in all submittal documents and materials are true, correct, accurate, and complete, and may be relied upon by Owner in considering the firm's bid. Contractor by execution of the agreement represents that it understands that it is Contractor's responsibility to immediately provide updated and correct information if any of the information changes at any time. Any omission, falsification or misrepresentation made by Contractor in such documents and materials or any supplement thereto, will be sufficient grounds for failure to employ Contractor or terminate any contract with the Owner.

5.10 Compliance with Owner's Policies, Regulations, Directives, and Practices: Contractor by entering into this Agreement with the Owner consents and agrees to comply at all times with all Owner policies, regulations, directives, and practices.

5.11 Equal Opportunity Employer and Non-Discrimination: Contractor by execution of this agreement certifies that Contractor is an equal opportunity employer and actively recruits a well-qualified and diverse staff including minority applicants as well as historically underutilized business subcontractors, and does not discriminate against any employee or applicant for employment or subcontractor by reason of race, color, national origin, religion, marital status, sex, age, disability or sexual orientation. By submitting a bid and by execution of this agreement, Contractor agrees to actively continue and implement this policy throughout any awarded project.

5.12 Contractor Residency Certification: The Contractor referenced in this Agreement is consenting to the Owner that they **Choose Item** submitting their bid as a Wyoming Resident Contractor.

[APPLICABLE TO THE BOX THAT IS CHECKED]

☐ No

☐ Yes, and my Contractor Residency Certification Number is **Enter Number Here**, and my bid complies with Wyoming Statute 16-6-103. The project will be awarded based on the Contractor's statement of meeting the requirements of Wyoming Statute 16-6-103. Subsequent information verifying the statute requirements have been met will be required up to and including possible audits. The audit is to confirm that the contractor has not subcontracted more than a total of 30% of the work covered by his contract to non-resident subcontractors and non-resident sub-tier contractors.

ARTICLE 6, CONTRACT DOCUMENTS: INTENT, AMENDING, REUSE

6.1 Intent: The Contract Documents are complementary; what is called for by one is as binding as if called for by all. It is the intent of the Contract Documents to describe a functionally complete Project (or part thereof) to be constructed in accordance with the Contract Documents. Any labor, documentation, services, materials, or equipment that may reasonably be inferred from the Contract Documents or from prevailing custom or trade usage as being required to produce the intended result will be provided whether or not specifically called for at no additional cost to Owner.

6.2 Clarifications and Interpretations: Clarifications and interpretations of the Contract Documents shall be issued by Architect as provided in the Contract Documents.

6.3 Reference Standards:

6.3.1 Standards, Specifications, Codes, Laws, and Regulations:

6.3.1.1 Reference to standards, specifications, manuals, or codes of any technical society, organization, or association, or to Laws or Regulations, whether such reference be specific or by implication, shall

mean the standard, specification, manual, code, or Laws or Regulations in effect at the time of opening of Bids (or on the Effective Date of the Agreement if there were no Bids), except as may be otherwise specifically stated in the Contract Documents.

6.3.1.2 No provision of any such standard, specification, manual or code, or any instruction of a Supplier shall be effective to change the duties or responsibilities of Owner, Contractor, or Architect, or any of their subcontractors, consultants, agents, or employees from those set forth in the Contract Documents, nor shall any such provision or instruction be effective to assign to Owner, Architect, or any of Architect's Consultants, agents, or employees any duty or authority to supervise or direct the performance of the Work or any duty or authority to undertake responsibility inconsistent with the provisions of the Contract Documents.

6.4 Reporting and Resolving Discrepancies:

6.4.1 Reporting Discrepancies: If, during the performance of the Work, Contractor discovers any conflict, error, ambiguity, or discrepancy within the Contract Documents or between the Contract Documents and any provision of any Law or Regulation applicable to the performance of the Work or of any standard, specification, manual or code, or of any instruction of any Supplier, Contractor shall report it to Architect in writing at once. Contractor shall not proceed with the Work affected thereby (except in an emergency) until an amendment or supplement to the Contract Documents has been issued; provided, however, that Contractor shall not be liable to Owner or Architect for failure to report any such conflict, error, ambiguity, or discrepancy unless Contractor knew or reasonably should have known thereof.

6.4.2 Resolving Discrepancies: Except as may be otherwise specifically stated in the Contract Documents, the provisions of the Contract Documents shall take precedence in resolving any conflict, error, ambiguity, or discrepancy between the provisions of the Contract Documents and:

6.4.2.1 The provisions of any standard, specification, manual, code, or instruction (whether or not specifically incorporated by reference in the Contract Documents); or,

6.4.2.2 The provisions of any Laws or Regulations applicable to the performance of the Work (unless such an interpretation of the provisions of the Contract Documents would result in violation of such Law or Regulation).

6.5 Amending and Supplementing Contract Documents:

6.5.1 The Contract Documents may be amended to provide for additions, deletions, and revisions in the Work or to modify the terms and conditions thereof in one or more of the following ways: (i) a Written Amendment; (ii) a Change Order; or (iii) a Work Change Directive.

6.5.2 The requirements of the Contract Documents may be supplemented and minor variations and deviations in the Work may be authorized by Change Order.

6.6 Reuse of Documents: Contractor and any Subcontractor or Supplier or other individual or entity performing or furnishing any of the Work under a direct or indirect contract with Owner: (i) shall not have or acquire any title to or ownership rights in any of the Drawings, Specifications, or other documents (or copies of any thereof) prepared by or bearing the seal of Architect or Architect's Consultant, including electronic media editions; and (ii) shall not reuse any of such Drawings, Specifications, other documents, or copies on extensions of the Project or any other project without written consent of Owner and Architect and specific written verification or adaption by Architect. This prohibition will survive final payment, completion, and acceptance of the Work, or termination or completion of the Contract. Nothing herein shall preclude Contractor from retaining copies of the Contract Documents for record purposes.

ARTICLE 7, DATE OF COMMENCEMENT, AND SUBSTANTIAL AND FINAL COMPLETION

7.1 Date of Commencement: The date of commencement of the Work shall be the first business day after Contractor receives a written Notice to Proceed issued by the Owner. **The Notice to Proceed shall not be issued by the Owner until the Agreement has been signed by Contractor, approved by Owner, signed by Owner's authorized representatives, and Owner and Architect have received all required payment and performance bonds and insurance, in compliance with this Contract.**

7.2 Contract Time: The Contract Time shall be measured from the date of commencement.

7.3 Substantial Completion:

7.3.1 Specified Time: Contractor shall achieve Substantial Completion of the entire Work not later than **July 2029** subject to adjustments of this Contract Time as provided in the Contract Documents.

7.3.2 Conditions Applicable to Substantial Completion: Substantial Completion is the stage in the progress of the Work when the Project Architect has determined that the Work or designated portion thereof is sufficiently complete and in working order in accordance with the Contract Documents, including but not limited to the following:

1. All project systems included in the Work or designated portion thereof have been successfully tested and are fully operational, and factory startup of equipment has been completed.
2. All required governmental inspections and certifications required of the Work have been made, approved, posted, and copies are on file with the Owner with AIA forms if required.
3. Designated initial training instruction of Owner's personnel in the operation of the project systems has been completed.
4. All the required finishes set out in the Construction Documents are in place.
5. The only remaining Work shall be **minor** in nature so that Owner can occupy the work or the applicable portion of the Work for all of its intended purposes on that date.
6. Completion of the Work by Contractor will not materially interfere with or hamper Owner's normal school operations or other intended use. Contractor must coordinate with school schedules.
7. As further condition of a determination of Substantial Completion, Contractor shall certify that all remaining Work shall be complete within thirty (30) days or Contractor shall provide a schedule for Final Completion approved in writing by Owner. In the event final completion is not achieved, liquidated damages may be reinstated.
8. Technology cabling shall be in place, tested for connectivity, cable ends terminated and labeled in accordance with the district's labeling scheme.
9. Fire alarm systems operational, tested, approved, and a graphic map installed.
10. All life safety systems, fire suppression, public address systems, and related items shall be tested and operational.
11. Electronic hardware installation is complete and operational.
12. Paved areas including, but not limited to, parking lots, driveways, curb and gutters, sidewalks, including areas required to be replaced.
13. Certificate of Compliance issued by the city or appropriate authority having jurisdiction for site work.
14. Temporary Certificate of Occupancy or Certificate of Occupancy issued by the city or appropriate authority having jurisdiction with no exceptions or outstanding items.
15. Sanitization of domestic water systems.
16. Verification of floor drains operation, free of obstructions and free-draining.
17. Removal of temporary facilities.
18. Removal of site obstructions, construction debris, and cleanup of site.
19. Submit written request for inspection to Architect and Owner.

20. Warranties will commence on date of Final Completion.
21. Receipt of approved Operations and Maintenance Manuals including product warranties.
22. Training of Staff.

7.4 Final Completion: Contractor shall achieve Final Completion of the Work of the Project by not later than thirty (30) days following the issuance of the Certificate of Substantial Completion or the date provided in Contractor's schedule for Final Completion approved in writing by Owner. The date of Final Completion is the date certified by the Project Architect that the Project Architect finds that the Work of the Project, including the work of all of Contractor's subcontractors, is acceptable under the Contract Documents and Contractor's contractual obligations are fully performed. The Project Architect's certification of Final Completion shall occur (1) upon issuance by Contractor of a written notice that the Work is ready for final inspection and acceptance, and (2) review and acceptance of the Work by the Project Architect and Owner.

7.5 Failure to Complete the Work on Time: Time is of the essence in all phases of the Work as the facilities being constructed must meet the schedule for the operation of the educational program of the School District. It is specifically understood and agreed by and between Owner and Contractor that time is of the essence in the Substantial Completion and Final Completion of the Project and Owner shall sustain actual and direct damages as a result of Contractor's failure, neglect or refusal to achieve said deadlines. Such actual and direct damages are, and will continue to be, impracticable and extremely difficult to determine. Execution of this Agreement under these specifications shall constitute agreement by Owner and Contractor that the amounts stated below are the minimum value of the costs and actual and direct damages caused by failure of Contractor to complete the Work within the allotted or agreed extended dates of Substantial and Final Completion, that such sums are liquidated direct damages and shall not be construed as a penalty, and that such sums may be deducted from payments due Contractor if such delay occurs. It is expressly understood that the sum per day is agreed upon as a fair estimate of the pecuniary damages which will be sustained by Owner in the event that the Work is not completed within the agreed time, or within the agreed extended time, if any, otherwise provided for herein. Said sum shall be considered as liquidated damages only and in no sense shall be considered a penalty, said damages being caused by, but not limited to, additional compensation for personnel, attorneys' fees, architectural fees, Architecting fees, program management fees, inspection fees, storage costs, food service costs, transportation costs, utilities costs, costs of temporary facilities, loss of interest on money, and other miscellaneous increased costs, all of which are difficult to exactly ascertain. Failure to complete the Work within the designated or agreed extended dates of Substantial or Final Completion shall be construed as a breach of this Agreement. The requirements of this Agreement regarding liquidated damages are as follows:

7.5.1 Liquidated Damages – Failure To Meet Substantial Completion Date: It is expressly agreed as a part of the consideration inducing Owner to execute this Agreement that Owner may deduct from the Final Payment made to Contractor a dollar amount per day established by the matrix set forth below for each and every additional calendar day beyond the agreed date of Substantial Completion.

Contract Range	Daily Liquidated Damages Charge
\$0.00 - \$500,000	\$ 250.00
\$500,001 - \$1,000,000	\$ 500.00
\$1,000,001 - \$2,000,000	\$ 750.00
\$2,000,001 - \$3,000,000	\$ 1,000.00
\$3,000,001 - \$5,000,000	\$ 1,250.00

Contract Range	Daily Liquidated Damages Charge
\$5,000,001 - \$7,500,000	\$ 1,500.00
\$7,500,001 - \$10,000,000	\$ 1,750.00
\$10,000,001- \$15,000,000	\$ 2,000.00
15,000,001 - \$20,000,000	\$ 2,250.00
\$20,000,001 and Greater	\$ 2,500.00

7.5.2 Liquidated Damages – Failure to Meet Final Completion Date: Timely Final Completion is an essential condition of this Agreement. Contractor agrees to achieve Final Completion of the Agreement within thirty (30) days of the designated or extended date of Substantial Completion or by the date provided in Contractor's schedule for Final Completion approved in writing Owner. Owner and Contractor agree that should Contractor fail to achieve Final Completion of the Agreement by the deadline, Owner shall continue to be damaged to a greater degree by such delay. Contractor and Owner agree that the amount of liquidated damages for each calendar day Final Completion is delayed beyond the date set for Final Completion shall be a dollar amount per day established as set forth in paragraph 7.5.1 above. Owner may deduct from the Final Payment made to Contractor, or, if sufficient funds are not available, then Contractor shall pay Owner the amounts specified per day for each and every calendar day the breach continues after the deadline for Final Completion of the Work.

7.5.3 Liquidated Damages – In Addition to Other Remedies: Such damages shall be in addition to, and not in lieu of, any other rights or remedies Owner may have against Contractor for failure to timely achieve Final Completion, and damages for failure to achieve Substantial Completion and failure to achieve Final Completion may run concurrently. If the Work is not finally completed by the time stated in the Agreement, or as extended, no payments for Work completed beyond that time shall be made until the Project reaches Final Completion.

ARTICLE 8, GENERAL EXECUTION AND PROGRESS OF THE WORK

8.1 Schedule: Contractor shall meet the schedule established by Owner for the Work, and the Project as a whole. Owner shall cooperate with Contractor to allow Contractor to schedule and perform Contractor's Work to avoid conflict, delay in or interference with the Work of Owner, other Contractors or Owner's own forces.

8.2 Shop Drawings, Product Data, Samples and Submittals: Contractor shall promptly (within two (2) weeks of project award) submit a schedule of Shop Drawings, Product Data, samples and similar submittals required by the Contract Documents. Shop Drawings, Product Data, samples and similar submittals shall be provided by the Contractor in such sequence as to cause no delay in the Work or in the activities of Owner or other Contractors.

8.3 Schedule of Values: Contractor shall submit to Owner a Schedule of Values allocated to the various parts of the Work of this Contract, aggregating the Contract Sum, made out in such detail as required by Owner, and supported by such evidence as Owner may require. In applying for payment, Contractor shall submit an allocation of the Work covered in the Application for Payment based upon this schedule.

8.4 Periodic Progress Reports: Contractor shall furnish to Owner periodic progress reports on the Work of this Project as mutually agreed but not less than monthly, including information on the status of materials and equipment which may be in the course of preparation, manufacture or transit.

8.5 Acceptance or Rejection of Work: Contractor agrees that Owner and the Architect will each have the authority to reject Work of Contractor which does not conform to the Contract Documents. Owner's decisions in consultation with the Architect on matters relating to the quality of workmanship and aesthetic effect of the work performed by Contractor shall be final and binding on Contractor if consistent with the intent expressed in the Contract Documents.

8.6 Timely Payment by Contractor for Materials and Equipment: Contractor shall timely pay for all materials and equipment used in connection with the performance of the Work of the Project through the period covered by previous payments received from Owner or in accordance with the terms of such purchase agreements entered into by Contractor, whichever is earlier, and shall pay for labor as incurred, and shall furnish satisfactory evidence, when requested by Owner, to verify compliance with the above requirements.

8.7 Protection of the Work: Contractor shall take necessary precautions to protect the Work of other contractors from damage caused by operations under this Agreement.

8.8 Coordination of the Work: Contractor shall cooperate with Owner, other Contractors and Owner's own forces whose Work might interfere with Contractor's Work. Contractor shall participate in the preparation of coordinated drawings in areas of congestion, if required by the Contract Documents, specifically noting and advising Owner of potential conflicts between the Work of Contractor and that of Owner, other Contractors or Owner's own forces.

8.9 Acceptance of Revisions in Schedule: Contractor recognizes that revisions in the planned schedule are inherent in the nature of construction. This may result in revisions to Owner's schedule of the Work during the progress of construction. Contractor agrees that Owner cannot guarantee Contractor will be able to start Work on any particular date or continue without interruption once started, provided Contractor may in such event proceed to access the delay claim process under the terms of this Agreement.

8.10 Environmental Requirements: When constructing a project involving trenching and/or other related earth excavations, Contractor shall comply with the following environmental constraints:

8.10.1 Wetlands: When disposing of excess, soil, or other construction materials on public or private property, Contractor shall not fill in or otherwise convert wetlands.

8.10.2 Floodplains: When disposing of excess, soil, or other construction materials on public or private property, Contractor shall not fill in or otherwise convert 100 year floodplain areas delineated on the latest Federal Emergency Management Agency Floodplain Maps.

8.10.3 Historic Preservation: Any excavation by Contractor that uncovers a historical or archaeological artifact shall be immediately reported to Owner. Construction shall be temporarily halted pending the notification process and further directions issued by Owner after consultation with the State Historic Preservation Officer (SHPO) or similar official.

8.10.4 Endangered Species: Contractor shall comply with the Endangered Species Act, which provides for the protection of endangered and/or threatened species and critical habitat. Should any evidence of the presence of endangered and/or threatened species or their critical habitat be brought to the attention of Contractor, Contractor will immediately report this evidence to Owner. Construction shall be temporarily halted pending the notification process and further directions issued by Owner after consultation with the U.S. Fish and Wildlife Service.

ARTICLE 9, COMPLIANCE WITH LAWS AND REGULATIONS:

9.1 Wyoming Residency, Bonding and Payment Statutes and Regulations: As a material term of this Agreement, Contractor shall at all times comply with all applicable federal and state statutes and any rules established by the SFD, including, but not limited to:

9.1.1 Wyo. Stat. § 16-6-707(c), requiring Contractor to comply with the residency and preference requirements imposed under Wyo. Stat. §§ 16-6-101 through 16-6-107 in the procurement of subcontractors and materials.

9.1.2 Wyo. Stat. § 16-6-112 requiring Contractor to comply with all reporting and administrative requirements including requirements relating to retainage, payment and performance bonding and default contracts.

9.1.3 Wyo. Stat. § 16-6-115 through 16-6-117 regarding final settlement and final payments to contractors and subcontractors.

9.2 Permits, Fees and Notices: Contractor shall give notices and comply with all laws, ordinances, rules, regulations and orders of public authorities bearing on performance of the Work of the Project. Contractor shall secure and pay for permits and governmental fees, licenses and inspections necessary for proper execution and completion of Contractor's Work.

9.3 Compliance With Tax, Social Security, Unemployment and Workers' Compensation Laws and Regulations: Contractor shall comply with federal, state and local tax laws, social security acts, unemployment compensation acts and workers' compensation acts insofar as applicable to the performance of the Contract Documents.

9.4 Equal Employment Opportunity and Verification of Immigration Status: Contractor shall comply with applicable laws, regulations and special requirements of the Contract Documents regarding equal employment opportunity and affirmative action programs; and specifically shall comply with all requirements of the federal immigration verification system to determine the work eligibility status of new employees physically performing services within the State of Wyoming, if required by state or federal law or regulation.

ARTICLE 10, CONTRACTOR'S RESPONSIBILITIES

10.1 Supervision: Contractor shall supervise, inspect, and direct the Work competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the Work in accordance with the Contract Documents. Contractor shall be solely responsible for the means, methods, techniques, sequences, and procedures of construction, but Contractor shall not be responsible for the negligence of Owner or Architect in the design or specification of a specific means, method, technique, sequence, or procedure of construction which is shown or indicated in and expressly required by the Contract Documents. Contractor shall be responsible to see that the completed Work complies accurately with the Contract Documents.

10.2 Superintendent: At all times during the progress of the Work, Contractor shall assign a competent superintendent thereto who shall not be replaced without written notice to Owner and Architect except under extraordinary circumstances. The superintendent will be Contractor's representative at the Site and shall have authority to act on behalf of Contractor. All communications given to or received from the superintendent shall be binding on Contractor.

10.3 Labor; Working Hours: Contractor shall provide competent, suitably qualified personnel to survey, lay out, and construct the Work as required by the Contract Documents. Contractor shall at all times maintain good discipline and order at the Site. Except as otherwise required for the safety or protection of persons or the Work or property at the Site or adjacent thereto, and except as otherwise stated in the Contract Documents, all Work at the Site shall be performed during regular working hours,

and Contractor will not permit overtime work or the performance of Work on Saturday, Sunday, or any legal holiday without Owner's written consent (which will not be unreasonably withheld).

10.4 Services, Materials, and Equipment: Contractor shall provide and assume full responsibility for all services, materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities, and all other facilities and incidentals necessary for the performance, testing, start-up, and completion of the Work. All materials and equipment incorporated into the Work shall be as specified or, if not specified, shall be of good quality and new, except as otherwise provided in the Contract Documents. All warranties and guarantees specifically called for by the Specifications shall expressly run to the benefit of Owner. If required by Architect, Contractor shall furnish satisfactory evidence (including reports of required tests) as to the source, kind, and quality of materials and equipment. All materials and equipment shall be stored, applied, installed, connected, erected, protected, used, cleaned, and conditioned in accordance with instructions of the applicable Supplier, except as otherwise may be provided in the Contract Documents.

10.5 Progress Schedule: Contractor shall adhere to the progress schedule established for the Project as it may be adjusted from time to time as provided below. Contractor shall submit to Architect for acceptance proposed adjustments in the progress schedule that will not result in changing the Contract Times (or Milestones). Such adjustments will conform generally to the progress schedule then in effect. Proposed adjustments in the progress schedule that will change the Contract Times (or Milestones) shall be submitted in accordance with the requirements of the Article addressing changes in the Work. Such adjustments may only be made by a Change Order.

10.6 Substitutes and "Or-Equals:"

10.6.1 Generally: Whenever an item of material or equipment is specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular Supplier, the specification or description is intended to establish the type, function, appearance, and quality required. Unless the specification or description contains or is followed by words reading that no like, equivalent, or "or-equal" item or no substitution is permitted, other items of material or equipment or material or equipment of other Suppliers may be submitted to Architect for review under the circumstances described below.

10.6.1.1 "Or-Equal" Items: If in Architect's and/or Owner's discretion an item of material or equipment proposed by Contractor is functionally equal to that named and sufficiently similar so that no change in related Work will be required, it may be considered by Architect as an "or-equal" item, in which case review and approval of the proposed item may, in Architect's sole discretion, be accomplished without compliance with some or all of the requirements for approval of proposed substitute items. For the purposes of this paragraph, a proposed item of material or equipment will be considered functionally equal to an item so named if:

10.6.1.1.1 In the exercise of reasonable judgment Architect determines that: (i) it is at least equal in quality, durability, appearance, strength, and design characteristics; (ii) it will reliably perform at least equally well the function imposed by the design concept of the completed Project as a functioning whole, and;

10.6.1.1.2 Contractor certifies that: (i) there is no increase in cost to Owner; and (ii) it will conform substantially, even with deviations, to the detailed requirements of the item named in the Contract Documents.

10.6.1.2 Substitute Items:

10.6.1.2.1 If in Architect's and/or Owner's discretion an item of material or equipment proposed by Contractor does not qualify as an "or-equal" item, it will be considered a proposed substitute item.

10.6.1.2.2 Contractor shall submit sufficient information as provided below to allow Architect to determine that the item of material or equipment proposed is essentially equivalent to that named and an acceptable substitute therefor. Requests for review of proposed substitute items of material or equipment will not be accepted by Architect from anyone other than Contractor.

10.6.1.2.3 The procedure for review by Architect will be as set forth in subparagraph (4), and as Contractor may decide is appropriate under the circumstances.

10.6.1.2.4 Contractor shall first make written application to Architect for review of a proposed substitute item of material or equipment that Contractor seeks to furnish or use. The application shall certify that the proposed substitute item will perform adequately the functions and achieve the results called for by the general design, be similar in substance to that specified, and be suited to the same use as that specified. The application will state the extent, if any, to which the use of the proposed substitute item will prejudice Contractor's achievement of Substantial Completion on time, whether or not use of the proposed substitute item in the Work will require a change in any of the Contract Documents (or in the provisions of any other direct contract with Owner for work on the Project) to adapt the design to the proposed substitute item and whether or not incorporation or use of the proposed substitute item in connection with the Work is subject to payment of any license fee or royalty. All variations of the proposed substitute item from that specified will be identified in the application, and available engineering, sales, maintenance, repair, and replacement services will be indicated. The application will also contain an itemized estimate of all costs or credits that will result directly or indirectly from use of such substitute item, including costs of redesign and claims of other contractors affected by any resulting change, all of which will be considered by Architect in evaluating the proposed substitute item. Architect may require Contractor to furnish additional data about the proposed substitute item.

10.6.2 Substitute Construction Methods or Procedures: If a specific means, method, technique, sequence, or procedure of construction is shown or indicated in and expressly required by the Contract Documents, Contractor may furnish or utilize a substitute means, method, technique, sequence, or procedure of construction approved by Architect. Contractor shall submit sufficient information to allow the Architect, in Architect's sole discretion, to determine that the substitute proposed is equivalent to that expressly called for by the Contract Documents. The procedure for review by Architect will be similar to that provided above.

10.6.3 Architect's Evaluation: The Architect will be allowed a reasonable time within which to evaluate each proposal or submittal made pursuant to the subparagraphs above in this section. The Architect will be the sole judge of acceptability. No "or-equal" or substitute will be ordered, installed or utilized until Architect's review is complete, which will be evidenced by either a Change Order for a substitute or an approved Shop Drawing for an "or equal." Architect will advise Contractor in writing of any negative determination.

10.6.4 Special Guarantee: Owner may require Contractor to furnish at Contractor's expense a special performance guarantee or other surety with respect to any substitute.

10.6.5 Expense of Substitution: Contractor shall provide all data in support of any proposed substitute or "or-equal" at Contractor's expense. The Owner and Contractor shall determine if the substitute constitutes a cost or savings to the Project, and adjust the Contract amount accordingly through an appropriate change order.

10.7 Concerning Subcontractors, Suppliers, and Others:

10.7.1 Contractor shall not employ any Subcontractor, Supplier, or other individual or entity, whether initially or as a replacement, against whom, Owner may have reasonable objection. Contractor shall not be required to employ any Subcontractor, Supplier, or other individual or entity to furnish or perform any of the Work against whom Contractor has reasonable objection.

10.7.2 Contractor shall identify all Subcontractors, Suppliers, or other individuals or entities in advance for acceptance by Owner as required in the bid documents, and Owner's acceptance (either in writing or by failing to make written objection thereto by the date indicated for acceptance or objection in the Bidding Documents or the Contract Documents) of any such Subcontractor, Supplier, or other individual or entity so identified may be revoked on the basis of reasonable objection after due investigation. Contractor shall submit an acceptable replacement for the rejected Subcontractor, Supplier, or other individual or entity, and the Contract Price will be adjusted by the difference in the cost occasioned by such replacement, and an appropriate Change Order will be issued or Written Amendment. No acceptance by Owner of any such Subcontractor, Supplier, or other individual or entity, whether initially or as a replacement, shall constitute a waiver of any right of Owner or Architect to reject defective Work.

10.7.3 Contractor shall be fully responsible to Owner and Architect for all acts and omissions of the Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work just as Contractor is responsible for Contractor's own acts and omissions. Nothing in the Contract Documents shall create for the benefit of any such Subcontractor, Supplier, or other individual or entity any contractual relationship between Owner or Architect and any such Subcontractor, Supplier or other individual or entity, nor shall it create any obligation on the part of Owner or Architect to pay or to see to the payment of any moneys due any such Subcontractor, Supplier, or other individual or entity except as may otherwise be required by Laws and Regulations.

10.7.4 Contractor shall be solely responsible for scheduling and coordinating the Work of Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work under a direct or indirect contract with Contractor.

10.7.5 Contractor shall require all Subcontractors, Suppliers, and such other individuals or entities performing or furnishing any of the Work to communicate with Architect through Contractor.

10.7.6 The divisions and sections of the Specifications and the identifications of any Drawings shall not control Contractor in dividing the Work among Subcontractors or Suppliers or delineating the Work to be performed by any specific trade.

10.7.7 All Work performed for Contractor by a Subcontractor or Supplier will be pursuant to an appropriate agreement between Contractor and the Subcontractor or Supplier which specifically binds the Subcontractor or Supplier to the applicable terms and conditions of the Contract Documents for the benefit of Owner and Architect. Whenever any such agreement is with a Subcontractor or Supplier who is listed as an additional insured on the property insurance provided in Article 4, the agreement between Contractor and the Subcontractor or Supplier will contain provisions whereby the Subcontractor or Supplier waives all rights against Owner, Contractor, Architect, Architect's Consultants, and all other individuals or entities identified in this Agreement to be listed as insured or additional insured (and the officers, directors, partners, employees, agents, and other consultants and subcontractors of each and any of them) for all losses and damages caused by, arising out of, relating to, or resulting from any of the perils or causes of loss covered by such policies and any other property insurance applicable to the Work. If the insurers on any such policies require separate waiver forms to be signed by any Subcontractor or Supplier, Contractor will obtain the same.

10.8 Patent Fees and Royalties:

10.8.1 Contractor shall pay all license fees and royalties and assume all costs incident to the use in the performance of the Work or the incorporation in the Work of any invention, design, process, product, or device which is the subject of patent rights or copyrights held by others. If a particular invention, design, process, product, or device is specified in the Contract Documents for use in the performance of the Work and if to the actual knowledge of Owner or Architect its use is subject to patent rights or copyrights calling for the payment of any license fee or royalty to others, the existence of such rights shall be disclosed by Owner in the Contract Documents.

10.9 Permits: Contractor shall obtain and pay for all construction permits and licenses. Owner shall assist Contractor, when necessary, in obtaining such permits and licenses. Contractor shall pay all governmental charges and inspection fees necessary to obtain such permits and licenses for the execution of the Work which are applicable at the time of opening of Bids, or, if there are no Bids, on the Effective Date of the Agreement.

10.10 Utility Connections: Contractor shall pay all charges of utility owners for connections to the Work unless otherwise provided in the Supplementary Conditions, and Owner shall pay all charges of such utility owners for capital costs related thereto, such as plant investment fees.

10.11 Laws and Regulations: In addition to compliance with the federal and state laws and regulations and school district policies and regulations provided in Article 9, Contractor shall assure that all of the Work is in compliance with applicable laws and regulations.

10.11.1 Contractor shall give all notices and comply with all Laws and Regulations applicable to the performance of the Work. Except where otherwise expressly required by applicable Laws and Regulations, neither Owner nor Architect shall be responsible for monitoring Contractor's compliance with any Laws or Regulations.

10.11.2 If Contractor performs any Work knowing or having reason to know that it is contrary to Laws or Regulations, Contractor shall bear all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such Work; however, it shall not be Contractor's primary responsibility to make certain that the Specifications and Drawings are in accordance with Laws and Regulations, but this shall not relieve Contractor of Contractor's obligations to report discrepancies in the Contract Documents.

10.11.3 Changes in Laws or Regulations not known at the time of opening of Bids (or, on the Effective Date of the Agreement if there were no Bids) having an effect on the cost or time of performance of the Work may be the subject of an adjustment in Contract Price or Contract Times.

10.12 Taxes:

10.12.1 Contractor shall pay all sales, consumer, use, and other similar taxes required to be paid by Contractor in accordance with the Laws and Regulations of the place of the Project which are applicable during the performance of the Work.

10.12.2 It is an expressed condition of this contract that the contractor be aware of Wyoming Statutes pertaining to sales tax, use tax, and payment of sales and use tax by contractors, and conform as required. Contractor shall be responsible for informing themselves of tax laws, Sales and Use Tax Laws, Wyoming Statutes, regulations, and interpretations as they apply to this project. The requirements under this section 10.12 include but are not limited to the following:

- .1 Obtain the applicable tax requirements from the Wyoming Department of Revenue for the county in which the materials, goods, fixtures and furnishings and all other tangible personal property required by this project are consumed.

- .2 Report the use, installation or transfer of such property into the project as a sale by licensed vendor and pay any and all taxes due, unless this tax was already included in the purchase price paid to the supplier.
- .3 The contractor shall require each subcontractor to comply with the same statutes and provisions and shall so stipulate in any agreement or contract with them.
- .4 For additional tax information contact: Department of Revenue, 122 West 25th Street, Suite E301, Cheyenne, Wyoming 82002.
- .5 Unless specified otherwise, the contract sum includes all taxes imposed prior to the Bid opening, and which are applicable to the work.

10.13 Use of Site and Other Areas:

10.13.1 Staging of the Work, Use of Site and Other Areas:

10.13.1.1 Contractor shall be responsible for coordinating and providing all construction administration necessary for the Work and the work of any of Owner's separate contractors, including the provisions at Contractor's cost of secure areas for the storage or staging of materials and equipment and the managing and performance of the construction of the Work. Contractor shall afford Owner and separate contractors reasonable site access and opportunity for introduction and storage or staging of their materials and equipment and performance of their activities, and shall connect and coordinate the Contractor's construction and operations with theirs as required by the Contract Documents.

10.13.1.2 Contractor shall confine construction equipment, the storage of materials and equipment, and the operations of workers to the Site and other areas permitted by Laws and Regulations, and shall not unreasonably encumber the Site and other areas with construction equipment or other materials or equipment. Contractor shall assume full responsibility for any damage to any such land or area, or to Owner or occupant thereof, or of any adjacent land or areas resulting from the performance of the Work.

10.13.1.3 Should any claim be made by any such owner or occupant because of the performance of the Work, Contractor shall promptly settle with such other party by negotiation or otherwise resolve the claim by arbitration or other dispute resolution proceeding or at law.

10.13.2 Removal of Debris During Performance of the Work: During the progress of the Work, Contractor shall keep the Site and other areas free from accumulations of waste materials, rubbish, and other debris. Removal and disposal of such waste materials, rubbish, and other debris shall conform to applicable Laws and Regulations.

10.13.3 Cleaning: Prior to Substantial Completion of the Work Contractor shall clean the Site and make it ready for utilization by Owner. At the completion of the Work Contractor shall remove from the Site all tools, appliances, construction equipment and machinery, and surplus materials and shall restore to original condition all property not designated for alteration by the Contract Documents.

10.13.4 Loading Structures: Contractor shall not load nor permit any part of any structure to be loaded in any manner that will endanger the structure, nor shall Contractor subject any part of the Work or adjacent property to stresses or pressures that will endanger it.

10.14 Record Documents: Contractor shall maintain in a safe place at the Site one record copy in hard form or electronically, as preferred by the Owner, of all Drawings, Specifications, Addenda, Written Amendments, Change Orders, Work Change Directives; Field Orders, and written interpretations and clarifications in good order and annotated to show changes made during construction. These record

documents together with all approved Samples and a counterpart of all approved Shop Drawings will be available to Architect for reference.

10.15 Safety and Protection:

10.15.1 General Supervision: Contractor shall be solely responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Work. Contractor shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury or loss to:

10.15.1.1 All persons on the Site or who may be affected by the Work;

10.15.1.2 All the Work and materials and equipment to be incorporated therein, whether in storage on or off the Site; and,

10.15.1.3 Other property at the Site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, utilities, and Underground Facilities not designated for removal, relocation, or replacement in the course of construction.

10.15.1.4 Hazardous Material Safety Precautions And Programs:

10.15.1.4.1 In the event that either the Owner or the Contractor become aware that an area in which the work will be performed is contaminated with asbestos containing material or polychlorinated biphenyl (PCB) that party shall promptly notify the other party of the existence of the contamination and the work shall be suspended until the contamination has been removed. It shall be the Owner's responsibility to decontaminate any area where asbestos containing material or PCB levels exceed acceptable legal limits. Owner further agrees that it has established an asbestos contamination monitoring and maintenance program.

10.15.1.4.2 The Contractor by signing this Agreement, certifies that no asbestos or asbestos containing materials will be installed or used in this project in order to satisfy Federal Register, Part III, Environmental Protection Agency 40 CRF, Part 763.85 Asbestos Containing Materials in Schools; Final Rule Notice.

10.15.1.4.3 The Contractor by signing this agreement certifies and agrees that no lead or lead containing materials will be installed or used on this project.

10.15.1.4.4 Each Subcontractor shall be responsible and pay for any damage that the Subcontractor may do to the property or work of others.

10.15.2 Safety Laws and Regulations: Contractor shall comply with all applicable Laws and Regulations, and Owner policies and regulations relating to the safety of persons or property, or to the protection of persons or property from damage, injury, or loss; and shall erect and maintain all necessary safeguards for such safety and protection. Contractor shall notify owners of adjacent property and of Underground Facilities and other utility owners when prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation, and replacement of their property. All damage, injury, or loss to any of the Work and materials and equipment to be incorporated therein, whether in storage on or off the Site caused, directly or indirectly, in whole or in part, by Contractor, any Subcontractor, Supplier, or any other individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, shall be remedied by Contractor (except damage or loss attributable to the fault of Drawings or Specifications or to the acts or omissions of Owner or Architect or Architect's Consultant, or anyone employed by any of them, or anyone for whose acts any of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of Contractor or any Subcontractor,

Supplier, or other individual or entity directly or indirectly employed by any of them). Contractor's duties and responsibilities for safety and for protection of the Work shall continue until such time as all the Work is completed and Architect has issued a notice to Owner and Contractor that the Work is acceptable (except as otherwise expressly provided in connection with Substantial Completion).

10.15.2.1 OSHA Compliance: Contractor agrees to fully comply with the Occupational Safety and Health Act (OSHA) of 1970 and any and all regulations issued pursuant thereto, and shall meet the following requirements with regard to such OSHA compliance:

10.15.2.1.1 As a term and condition of this Agreement, Contractor shall keep and save Owner harmless from any claims or charges of any kind by reason of Contractor failing to fully comply with the Occupational Safety and Health Act of 1970 and the regulations thereto. Contractor agrees to reimburse Owner for any fines, damages, or expenses of any kind incurred by Owner by reason of Contractor's failure to comply.

10.15.2.1.2 It will be a requirement of this Agreement that Contractor must have a safety program and will abide by the safety standards of OSHA. Any fines levied by OSHA to Owner resulting from violations of the OSHA standards by Contractor will be deducted from payment for work performed.

10.15.2.1.3 Contractor will hold a weekly safety meeting and provide reports of the topics discussed to Owner, if requested. Contractor will make available on request of Owner evidence of not less than a weekly scheduled safety inspection performed by a competent person for the time in which the aforesaid Contractor is on the job to the extent of their work only.

10.15.2.1.4 Contractor agrees that if in the performance of this Agreement, it becomes necessary, convenient, advisable to remove, replace or interfere with any safety device or controls installed by Owner or another Contractor, Contractor shall notify and obtain the written authorization from Owner to remove, replace or interfere with any safety device or controls. Contractor will replace or restore such devices or controls at its own expense as soon as possible to maintain the effectiveness of such safety device or control, and not less than on a daily basis. In the event that safety devices or controls are not replaced or restored, Contractor agrees to reimburse Owner for doing so. (Safety devices herein are defined as handrails, temporary fencing, barricades, traffic control devices, etc.).

10.15.2.1.5 Contractor shall set up, arrange, coordinate and obtain all inspections for their work, as required by any authorized agency or applicable code. Arrangements for the inspection of any area, system, equipment, etc. needing testing or inspection prior to being covered up must be made by Contractor in sufficient time to allow for inspection, and Contractor shall not cover-up any area until the inspections are complete.

10.15.2.1.6 A Work Plan may be required by Owner outlining the step-by-step procedures that are necessary to accomplish the installation, including all safety considerations.

10.15.2.1.7 Contractor hereby verifies that he has notified Owner in writing of any hazardous chemicals or mixtures containing one or more hazardous chemicals which are to be provided under this Agreement. "Hazardous Chemicals" are defined as "Any chemical which is a physical hazard or health hazard." For each item to be provided by Contractor under this Agreement which is identified as a hazardous chemical, Contractor shall provide a MSDS sheet to Owner.

10.15.2.1.8 Contractor shall be solely responsible for the health and safety of its employees, agents, subcontractors and representatives. In addition, Contractor shall take all necessary and prudent safety precautions with respect to its work and shall fully and timely comply with all safety programs initiated by Owner, as well as with all applicable laws, ordinances, rules, permits, regulations and orders of any public authority for the safety of persons or property. Owner is not responsible in any manner for the safety of Contractor's work or its employees, agents or representatives.

10.15.2.1.9 If Contractor fails to correct any procedures, acts or conditions which Owner believes are unsafe within an eight (8) hour period of written notification by Owner, or any public authority, Owner may (but has no contractual obligation to do so) correct the unsafe practice and charge Contractor for all costs, direct and indirect, for correction, plus ten percent (10%) for overhead, ten percent (10%) for profit and twenty percent (20%) for a safety premium. This specifically includes, but is not limited to, the cleanup of construction debris and the replacement or installation of railings or barricades. Contractor's repeated failures to timely and satisfactorily correct unsafe procedures, acts or conditions as aforesaid shall constitute a material default upon which a termination may be based without any further or additional notice to Contractor.

10.15.3 Acts of Employees: Contractor shall be responsible to Owner for acts and omissions of Contractor's employees, Subcontractors and their agents and employees, and other persons or entities performing portions of the Work for, or on behalf of, Contractor or any of its Subcontractors. As part of that responsibility, Contractor shall enforce Owner's alcohol-free, drug-free, tobacco-free, harassment-free and weapon-free policies and zones, which will require compliance with those policies and zones by the Contractor's employees, subcontractors, and all other persons carrying out the Contract.

10.15.4 Site Security Identification: At construction project sites located on or adjacent to an existing school building where students, staff and patrons are present, Contractor shall require all construction workers, whether Contractor's own forces or the forces of Contractor's subcontractors, to wear identification tags on the front of their persons during all times that they are on Owner's property. Such identification tags shall contain a current photograph and the worker's full name in a typeface large enough to be seen from a reasonable distance.

10.15.5 Vehicle Parking: Contractor shall require all construction workers, whether Contractor's own forces or the forces of Contractor's subcontractors, to park their personal motor vehicles on Owner's property only in the parking places designated by Owner's campus School Principal. Any vehicles not parked in the appropriate locations shall be towed at the vehicle owner's sole expense.

10.15.6 Theft Deterrence Program: Contractor shall coordinate with Owner with the institution of a theft deterrence program, if any is required in the Contract Documents, designed to restrict construction worker access to properties of Owner that are currently in use, to maintain supervision of Contractor's and Contractor's subcontractor's forces, and to reimburse Owner or those persons suffering a theft loss which results from Contractor's forces or Contractor's subcontractor's forces' actions, omissions, or failure to secure the Work or adjoining property.

10.15.7 Exclusion of Persons With Criminal Records: By signing this Agreement, Contractor does hereby agree, certify, warrant and represent on behalf of itself, and agrees to see that each subcontractor performing the Work shall not assign any individual or agent to work on a project site located on or adjacent to an existing school building where students, staff and patrons are present any person identified as a registered sex offender under the laws of the State of Wyoming. Contractor does hereby agree on behalf of itself, and agrees to see that each subcontractor performing the Work shall authorize and give consent, and by signing an Agreement with Owner agrees to cooperate in obtaining any additional authorization or consent necessary to assure compliance with this requirement.

10.16 Safety Representative: Contractor shall designate a qualified and experienced safety representative at the Site whose duties and responsibilities shall be the prevention of accidents and the maintaining and supervising of safety precautions and programs.

10.17 Hazard Communication Programs: Contractor shall be responsible for coordinating any exchange of material safety data sheets or other hazard communication information required to be made available to or exchanged between or among employers at the Site in accordance with Laws or Regulations.

10.18 Emergencies: In emergencies affecting the safety or protection of persons or the Work or property at the Site or adjacent thereto, Contractor is obligated to act to prevent threatened damage, injury, or loss. Contractor shall give Architect prompt written notice if Contractor believes that any significant changes in the Work or variations from the Contract Documents have been caused thereby or are required as a result thereof. If Architect determines that a change in the Contract Documents is required because of the action taken by Contractor in response to such an emergency, a Work Change Directive or Change Order will be issued.

10.19 Shop Drawings and Samples:

10.19.1 Submission of Shop Drawings: Contractor shall submit Shop Drawings to Architect for review and approval in accordance with the acceptable schedule of Shop Drawings and Sample submittals. All submittals will be identified as Architect may require and in the number of copies specified in the Contract Documents. The data shown on the Shop Drawings will be complete with respect to quantities, dimensions, specified performance and design criteria, materials, and similar data to show Architect the services, materials, and equipment Contractor proposes to provide and to enable Architect to review and approve the information for the limited purposes required by subparagraph 10.19.5 below. All shop drawings shall be submitted, transmitted, and collectively stored in an Electronic Format that is accessible to the manufacturer, vendor, supplier, subcontractor, General Contractor, Architect, Consultants, and the Owner.

10.19.2 Submission of Samples: Contractor shall also submit Samples to Architect for review and approval in accordance with the acceptable schedule of Shop Drawings and Sample submittals. Each Sample will be identified clearly as to material, Supplier, pertinent data such as catalog numbers, and the use for which intended and otherwise as Architect may require to enable Architect to review the submittal for the limited purposes required by subparagraph 10.19.5 below. The numbers of each Sample to be submitted will be as specified in the Specifications.

10.19.3 Use of Unapproved Shop Drawings or Samples: Where a Shop Drawing or Sample is required by the Contract Documents or the schedule of Shop Drawings and Sample submittals acceptable to Architect, any related Work performed prior to Architect's review and approval of the pertinent submittal will be at the sole expense and responsibility of Contractor.

10.19.4 Submittal Procedures:

10.19.4.1 Before submitting each Shop Drawing or Sample, Contractor shall have determined and verified:

10.19.4.1.1 All field measurements, quantities, dimensions, specified performance criteria, installation requirements, materials, catalog numbers, and similar information with respect thereto;

10.19.4.1.2 All materials with respect to intended use, fabrication, shipping, handling, storage, assembly, and installation pertaining to the performance of the Work;

10.19.4.1.3 All information relative to means, methods, techniques, sequences, and procedures of construction and safety precautions and programs incident thereto; and

10.19.4.1.4 Contractor shall also have reviewed and coordinated each Shop Drawing or Sample with other Shop Drawings and Samples and with the requirements of the Work and the Contract Documents.

10.19.4.2 Each submittal shall bear a stamp or specific written indication that Contractor has satisfied Contractor's obligations under the Contract Documents with respect to Contractor's review and approval of that submittal.

10.19.4.3 At the time of each submittal, Contractor shall give Architect specific written notice of such variations, if any, that the Shop Drawing or Sample submitted may have from the requirements of the Contract Documents, such notice to be in a written communication separate from the submittal; and, in addition, shall cause a specific notation to be made on each Shop Drawing and Sample submitted to Architect for review and approval of each such variation.

10.19.5 Architect's Review and Approval:

10.19.5.1 Architect will timely review and approve Shop Drawings and Samples in accordance with the schedule of Shop Drawings and Sample submittals acceptable to Architect. Architect's review and approval will be only to determine if the items covered by the submittals will, after installation or incorporation in the Work, conform to the information given in the Contract Documents and be compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents.

10.19.5.2 Architect's review and approval will not extend to means, methods, techniques, sequences, or procedures of construction (except where a particular means, method, technique, sequence, or procedure of construction is specifically and expressly called for by the Contract Documents) or to safety precautions or programs incident thereto. The review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.

10.19.5.3 Architect's review and approval of Shop Drawings or Samples shall not relieve Contractor from responsibility for any variation from the requirements of the Contract Documents unless Contractor has in writing called Architect's attention to each such variation at the time of each submittal as required by and Architect has given written approval of each such variation by specific written notation thereof incorporated in or accompanying the Shop Drawing or Sample approval; nor will any approval by Architect relieve Contractor from responsibility for complying with the requirements of subparagraph 10.19.4 above.

10.19.6 Resubmittal Procedures: Contractor shall make corrections required by Architect and shall return the required number of corrected copies of Shop Drawings and submit as required new Samples for review and approval. Architect shall direct specific attention in writing to revisions other than the corrections called for by Architect on previous submittals.

10.20 Continuing the Work: Contractor shall carry on the Work and adhere to the progress schedule during all disputes or disagreements with Owner or Architect unless otherwise notified by the Owner. No Work shall be delayed or postponed pending resolution of any disputes or disagreements, except if Contractor is permitted by the provisions of this Agreement to stop the Work or terminate the Work, or as Owner and Contractor may otherwise agree in writing.

10.21 Contractor's General Warranty and Guarantee:

10.21.1 Contractor warrants and guarantees to Owner, Architect, and Architect's Consultants that all Work will be in accordance with the Contract Documents and will not be defective. Contractor's warranty and guarantee hereunder excludes defects or damage caused by:

10.21.1.1 Abuse, modification, or improper maintenance or operation by persons other than Contractor, Subcontractors, Suppliers, or any other individual or entity for whom Contractor is responsible; or

10.21.1.2 Normal wear and tear under normal usage.

10.21.2 Contractor's obligation to perform and complete the Work in accordance with the Contract Documents shall be absolute. None of the following will constitute an acceptance of Work that is not in

accordance with the Contract Documents or a release of Contractor's obligation to perform the Work in accordance with the Contract Documents:

- 10.21.2.1 Observations by Architect;
- 10.21.2.2 Recommendation by Architect or payment by Owner of any progress or final payment;
- 10.21.2.3 The issuance of a certificate of Substantial Completion by Architect or any payment related thereto by Owner;
- 10.21.2.4 Use or occupancy of the Work or any part thereof by Owner;
- 10.21.2.5 Any acceptance by Owner or any failure to do so;
- 10.21.2.6 Any review and approval of a Shop Drawing or Sample submittal or the issuance of a notice of acceptability by Architect;
- 10.21.2.7 Any inspection, test, or approval by others; or
- 10.21.2.8 Any correction of defective Work by Owner.

10.22 Indemnification:

10.22.1 To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner, Architect, Architect's Consultants, and the officers, directors, partners, employees, agents, and other consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to the performance of the Work, provided that any such claim, cost, loss, or damage:

10.22.1.1 Is attributable to, arising out of, or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device not specified in the Contract Documents;

10.22.1.2 Is attributable to bodily injury, sickness, disease, or death, or to injury to or destruction of tangible property (other than the Work itself), including the loss of use resulting therefrom; or

10.22.1.3 Is caused in whole or in part by any negligent act or omission of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work or anyone for whose acts any of them may be liable, regardless of whether or not caused in part by any negligence or omission of an individual or entity indemnified hereunder or whether liability is imposed upon such indemnified party by Laws and Regulations regardless of the negligence of any such individual or entity.

10.22.2 In any and all claims against Owner or Architect or any of their respective consultants, agents, officers, directors, partners, or employees by any employee (or the survivor or personal representative of such employee) of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, the indemnification obligation under subparagraph 10.22 shall not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for Contractor or any such Subcontractor, Supplier, or other individual or entity under workers' compensation acts, disability benefit acts, or other employee benefit acts.

10.22.3 The indemnification obligations of Contractor under subparagraph 10.22 shall not extend to the liability of Architect and Architect's Consultants or to the officers, directors, partners, employees, agents, and other consultants and subcontractors of each and any of them arising out of:

10.22.3.1 The preparation or approval of, or the failure to prepare or approve, maps, Drawings, opinions, reports, surveys, Change Orders, designs, or Specifications; or

10.22.3.2 Giving directions or instructions, or failing to give them, if that is the primary cause of the injury or damage.

ARTICLE 11, AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; REFERENCE POINTS

11.1 Availability of Lands and Information Regarding Lands:

11.1.1 Owner Furnishing the Site: Owner shall notify Contractor of any encumbrances or restrictions not of general application but specifically related to use of the Site with which Contractor must comply in performing the Work. Owner will obtain in a timely manner and pay for easements for permanent structures or permanent changes in existing facilities. If Contractor and Owner are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times, or both, as a result of any delay in Owner's furnishing the Site, Contractor may make a Claim therefore.

11.1.2 Upon reasonable written request, Owner shall furnish Contractor with a current statement of record legal title and legal description of the lands upon which the Work is to be performed and Owner's interest therein as necessary for giving notice of or filing a mechanic's or construction lien against such lands in accordance with applicable Laws and Regulations.

11.1.3 Contractor shall provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment.

11.1.4 Information Regarding Lands:

11.1.4.1 Reports and Drawings: The contract documents shall identify those reports of explorations and tests of subsurface conditions at or contiguous to the Site that the Architect has used in preparing the Contract Documents; and those drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the Site (except Underground Facilities) that the Architect has used in preparing the Contract Documents.

11.1.4.2 Limited Reliance by Contractor on Technical Data Authorized: Contractor may rely upon the general accuracy of the "technical data" contained in such reports and drawings, but such reports and drawings are not Contract Documents. Such "technical data" is identified in this Agreement. Except for such reliance on such "technical data," Contractor may not rely upon or make any Claim against Owner, Architect, or any of Architect's Consultants with respect to:

11.1.4.2.1 The completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor, and safety precautions and programs incident thereto; or

11.1.4.2.2 Other data, interpretations, opinions, and information contained in such reports or shown or indicated in such drawings; or

11.1.4.2.3 Any Contractor interpretation of or conclusion drawn from any "technical data" or any such other data, interpretations, opinions, or information.

11.2 Subsurface or Physical Conditions:

11.2.1 **NOTICE:** If Contractor believes that any subsurface or physical condition at or contiguous to the site that is uncovered or revealed either:

11.2.1.1 Is of such a nature as to establish that any "technical data" on which Contractor is entitled to rely as provided herein with regard to Subsurface and Physical Conditions is materially inaccurate; or

11.2.1.2 Is of such a nature as to require a change in the Contract Documents; or

11.2.1.3 Differs materially from that shown or indicated in the Contract Documents; or,

11.2.1.4 Is of an unusual nature, and differs materially from conditions ordinarily encountered and generally recognized as inherent in work of the character provided in the Contract Documents; then Contractor shall, promptly after becoming aware thereof and before further disturbing the subsurface or physical conditions or performing any Work in connection therewith (except in an emergency as defined herein), notify Owner and Architect in writing about such condition. Contractor shall not further disturb such condition or perform any Work in connection therewith (except as aforesaid) until receipt of written order to do so.

11.2.2 Architect's Review: After receipt of written notice from Contractor, the Architect will promptly review the pertinent condition, determine the necessity of Owner's obtaining additional exploration or tests with respect thereto, and advise Owner in writing (with a copy to Contractor) of Architect's findings and conclusions.

11.2.3 Possible Price and Time Adjustments:

11.2.3.1 The Contract Price or the Contract Times, or both, will be equitably adjusted to the extent that the existence of such differing subsurface or physical condition causes an increase or decrease in Contractor's cost of, or time required for, performance of the Work.

11.2.3.2 Contractor shall not be entitled to any adjustment in the Contract Price or Contract Times if:

11.2.3.2.1 Contractor knew of the existence of such conditions at the time Contractor made a final commitment to Owner in respect of Contract Price and Contract Times by the submission of a Bid or becoming bound under a negotiated contract; or

11.2.3.2.2 The existence of such condition could reasonably have been discovered or revealed as a result of any examination, investigation, exploration, test, or study of the Site and contiguous areas required by the Bidding Requirements or Contract Documents to be conducted by or for Contractor prior to Contractor's making such final commitment; or

11.2.3.2.3 Contractor failed to give the written notice within the time and as required above.

11.2.3.3 If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times, or both, a Claim may be made therefore as provided in this Agreement. However, Owner, Architect, and Architect's Consultants shall not be liable to Contractor for any claims, costs, losses, or damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by Contractor on or in connection with any other project or anticipated project.

11.3 Underground Facilities:

11.3.1 Shown or Indicated: The information and data shown or indicated in the Contract Documents with respect to existing Underground Facilities at or contiguous to the Site is based on information and data furnished to Owner or Architect by Owners of such Underground Facilities, including Owner, or by others, provided that:

11.3.1.1 Owner and Architect shall not be responsible for the accuracy or completeness of any such information or data; and

11.3.1.2 The cost of all of the following will be included in the Contract Price, and Contractor shall have full responsibility for:

11.3.1.2.1 Reviewing and checking all such information and data,

11.3.1.2.2 Locating all Underground Facilities shown or indicated in the Contract Documents,

11.3.1.2.3 Coordination of the Work with Owners of such Underground Facilities, including Owner, during construction, and

11.3.1.2.4 The safety and protection of all such Underground Facilities and repairing any damage thereto resulting from the Work.

11.3.2 Not Shown or Indicated:

11.3.2.1 If an Underground Facility is uncovered or revealed at or contiguous to the Site which was not shown or indicated, or not shown or indicated with reasonable accuracy in the Contract Documents, Contractor shall, promptly after becoming aware thereof and before further disturbing conditions affected thereby or performing any Work in connection therewith (except in an emergency as defined in this Agreement), identify Owner of such Underground Facility and give written notice to that Owner and to Owner and Architect. The Architect will promptly review the Underground Facility and determine the extent, if any, to which a change is required in the Contract Documents to reflect and document the consequences of the existence or location of the Underground Facility. During such time, Contractor shall be responsible for the safety and protection of such Underground Facility.

11.3.2.2 If Architect concludes that a change in the Contract Documents is required, the appropriate documentation will be issued to reflect and document such consequences. An equitable adjustment shall be made in the Contract Price or Contract Times, or both, to the extent that they are attributable to the existence or location of any Underground Facility that was not shown or indicated or not shown or indicated with reasonable accuracy in the Contract Documents and that Contractor did not know of and could not reasonably have been expected to be aware of or to have anticipated. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment in Contract Price or Contract Times, Owner or Contractor may make a Claim therefore as provided in this Agreement.

11.4 Reference Points: Owner, through the Architect, shall provide in the Contract documents the engineering surveys necessary to establish pre-construction reference points for construction which in Architect's judgment are necessary to enable Contractor to proceed with the Work. Contractor shall be responsible for laying out the Work, shall protect and preserve the established reference points and property monuments, and shall make no changes or relocations without the prior written approval of Owner. Contractor shall report to Architect whenever any reference point or property monument is lost or destroyed or requires relocation because of necessary changes in grades or locations, and shall be responsible for the accurate replacement or relocation of such reference points or property monuments by professionally qualified personnel.

11.5 Hazardous Environmental Condition at Site:

11.5.1 Contractor shall not be responsible for any Hazardous Environmental Condition uncovered or revealed at the Site which was not shown or indicated in Drawings or Specifications or identified in the Contract Documents to be within the Scope of the Work or should have been known by Contractor by reasonable inspection of the Site. Contractor shall be responsible for a Hazardous Environmental Condition created with any materials brought to the Site by Contractor, Subcontractors, Suppliers, or anyone else for whom Contractor is responsible.

11.5.2 If Contractor encounters a Hazardous Environmental Condition or if Contractor or anyone for whom Contractor is responsible creates a Hazardous Environmental Condition, Contractor shall immediately: (i) secure or otherwise isolate such condition; (ii) stop all Work in connection with such condition and in any area affected thereby (except in an emergency as defined in this Agreement); and (iii) notify Owner and Architect (and promptly thereafter confirm such notice in writing). Owner shall promptly consult with Architect concerning the necessity for Owner to retain a qualified expert to evaluate such condition or take corrective action, if any.

11.5.3 Contractor shall not be required to resume Work in connection with such condition or in any affected area until after Owner has obtained any required permits related thereto and delivered to Contractor written notice: (i) specifying that such condition and any affected area is or has been rendered safe for the resumption of Work; or (ii) specifying any special conditions under which such Work may be resumed safely. If Owner and Contractor cannot agree as to entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times, or both, as a result of such Work stoppage or such special conditions under which Work stoppage to be resumed by Contractor, either party may make a Claim therefore as provided in this Agreement.

11.5.4 If after receipt of such written notice Contractor does not agree to resume such Work based on a reasonable belief it is unsafe, or does not agree to resume such Work under such special conditions, then Owner may order the portion of the Work that is in the area affected by such condition to be deleted from the Work. If Owner and Contractor cannot agree as to entitlement to or on the amount or extent, if any, of an adjustment in Contract Price or Contract Times as a result of deleting such portion of the Work, then either party may make a Claim therefor as provided in this Agreement. Owner may have such deleted portion of the Work performed by Owner's own forces or others in accordance with the article relating to Other Work.

11.5.5 To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner, Architect, Architect's Consultants, and the officers, directors, partners, employees, agents, other consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition created by Contractor or by anyone for whom Contractor is responsible. Nothing in this paragraph shall obligate Contractor to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.

11.5.6 The provisions of paragraphs above are not intended to apply to a Hazardous Environmental Condition uncovered or revealed at the Site.

ARTICLE 12, OTHER WORK

12.1 Related Work at Site:

12.1.1 Owner may perform other work related to the Project at the Site by Owner's employees, or let other direct contracts therefor, or have other work performed by utility owners. If such other work is not noted in the Contract Documents, then:

12.1.1.1 Written notice thereof will be given to Contractor prior to starting any such other work; and

12.1.1.2 If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times that should be allowed as a result of such other work, a Claim may be made therefor as provided in this Agreement.

12.1.2 Contractor shall afford each other contractor who is a party to such a direct contract and each utility owner (and Owner, if Owner is performing the other work with Owner's employees) proper and

safe access to the Site and a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such other work and shall properly coordinate the Work with theirs. Unless otherwise provided in the Contract Documents, Contractor shall do all cutting, fitting, and patching of the Work that may be required to properly connect or otherwise make its several parts come together and properly integrate with such other work. Contractor shall not endanger any work of others by cutting, excavating, or otherwise altering their work and will only cut or alter their work with the written consent of Architect and the others whose work will be affected. The duties and responsibilities of Contractor under this paragraph are for the benefit of such utility owners and other contractors to the extent that there are comparable provisions for the benefit of Contractor in said direct contracts between Owner and such utility owners and other contractors.

12.1.3 If the proper execution or results of any part of Contractor's Work depends upon work performed by others under this Article, Contractor shall inspect such other work and promptly report to Architect in writing any delays, defects, or deficiencies in such other work that render it unavailable or unsuitable for the proper execution and results of Contractor's Work. Contractor's failure to so report will constitute an acceptance of such other work as fit and proper for integration with Contractor's Work except for latent defects and deficiencies in such other work.

12.2 Coordination:

12.2.1 If Owner intends to contract with others for the performance of other work on the Project at the Site, the following will be set forth herein:

12.2.1.1 The individual or entity that will have authority and responsibility for coordination of the activities among the various contractors will be identified;

12.2.1.2 The specific matters to be covered by such authority and responsibility will be itemized; and

12.2.1.3 The extent of such authority and responsibilities will be provided.

12.2.2 Unless otherwise provided herein, Owner shall have sole authority and responsibility for such coordination.

ARTICLE 13, OWNER'S RIGHTS AND RESPONSIBILITIES

13.1 Communications to Contractor: Except as otherwise provided herein, Owner shall issue all communications to Contractor through Architect.

13.2 Replacement of Architect: In case of termination of the Architect's agreement with Owner, Owner shall appoint an Architect to whom Contractor makes no reasonable objection, whose status under the Contract Documents shall be that of the former Architect.

13.3 Furnish Information and Data: Owner shall promptly furnish the requested information and data to Owner if available and appropriate.

13.4 Independent Testing: Owner shall furnish independent tests, inspections and reports required by law, the Contract Documents or deemed appropriate by the Owner, such as structural, mechanical, and chemical tests, tests for air and water pollution, and tests for hazardous materials to be conducted by consultants retained by the Owner.

13.5 Pay Promptly When Due: Owner shall make payments to Contractor promptly when they are due.

13.6 Surveys: Owner shall furnish surveys to describe physical characteristics, legal limitations and utility locations for the site of the Project, a written legal description of the site, and services of

geotechnical engineers or other consultants when the Architect or Contractor requests such services and demonstrates that they are reasonably required by the scope of the Project.

13.7 Insurance: Owner's responsibilities, if any, in respect to purchasing and maintaining liability and property insurance are set forth in Article 4.

13.8 Change Orders: Owner is obligated to execute Change Orders.

13.9 Limitations on Owner's Responsibilities: Owner shall not supervise, direct, or have control or authority over, nor be responsible for, Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Owner will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.

13.10 Undisclosed Hazardous Environmental Condition: Owner's responsibility in respect to an undisclosed Hazardous Environmental Condition as provided in this Agreement.

13.11 Owner's Milestone Dates and Equipment:

13.11.1 Owner shall establish the milestone dates for the Project, and Contractor shall be required to develop a schedule to meet the milestones dates and to meet such schedule. Owner will work with Contractor in scheduling and performing the work of the Project being performed by Owner or others, to avoid conflicts or interference in Contractor's Work and shall expedite written responses to submittals.

13.11.2 Owner's equipment will be available to Contractor only at Owner's discretion and on mutually satisfactory terms.

13.12 Communications:

13.12.1 Owner shall promptly make available to Contractor information which affects this Contract and which becomes available to Owner subsequent to execution of this Contract.

13.12.2 Owner shall not give instructions or orders directly to Contractor's employees or to Contractor's Subcontractors or material suppliers unless such persons are designated as authorized representatives of Contractor.

13.12.3 If Owner becomes aware of hazardous substances at the Project site of a type of which an employer is required by law to notify its employees are being used on the site by a Contractor or anyone directly or indirectly employed by them (other than Contractor), Owner shall, prior to harmful exposure of Contractor's employees to such substance, give written notice of the chemical composition thereof to Contractor in sufficient detail and time to permit Contractor's compliance with such laws.

13.12.4 If Owner asserts or defends a claim against Owner which relates to the Work of Contractor, Owner shall make available to Contractor information relating to that portion of the claim which relates to the Work of Contractor.

13.13 Claims by Owner:

13.13.1 Damages for delay shall be assessed against Contractor only to the extent caused by Contractor or any person or entity for whose acts Contractor may be liable, and in no case for delays or causes arising outside the scope of this Contract.

13.13.2 Owner's claims for services or materials provided Contractor shall require:

13.13.2.1 Prior written notice except in an emergency;

13.13.2.2 Written compilations to Contractor of services and materials provided and charges for such services and materials no later than the fifteenth (15th) day of the following month.

13.14 Owner's Remedies:

13.14.1 Should Contractor at any time: (i) refuse or neglect to supply sufficient and properly skilled workers; (ii) refuse or neglect to supply materials of the proper quality; (iii) fail in any respect to follow revised construction schedules; (iv) fail in any respect to complete the Work with promptness and diligence; or (v) fail in the performance of any of the covenants contained herein; and fail to correct such default or neglect with diligence and promptness within one (1) work day of written notice from Owner, then Owner may, without additional written notice and without prejudice to any other remedy, either:

13.14.1.1 Provide such labor, materials, or services or other Work as is required by this Contract and deduct the cost thereof from any money then due or thereafter to become due to Contractor under this Agreement;

13.14.1.2 Terminate this Agreement for the Work and enter upon the premises and take possession for the purpose of completing the Work included under this Agreement of all materials, tools and appliances thereon, and to employ any other person or persons to finish the Work, and to provide the materials required under this Agreement.

13.14.2 Owner shall be entitled to recover all of its expenses under this paragraph, including all labor, materials, and services (whether by Owner or others) and any other cost (including attorneys' fees) or damages incurred as a result of Contractor's default. If such expense exceeds the unpaid balance of the amount to be paid under this Agreement, Contractor shall pay the difference to Owner on demand. If this Agreement is terminated, Contractor shall not be entitled to receive any further payment under this Agreement until the Work is completed.

13.14.3 If at any time there shall be evidence of any invoice, bill, lien or claim arising from Contractor's operations under this Agreement, or any other agreement between the parties (Claim) for which Owner, a surety, or any property, might be or become liable or subject to, Owner shall have the right to retain out of any payment then due or thereafter to become due Contractor, an amount sufficient to discharge such Claim and reimburse the Contractor, Owner, and surety for all costs and expenses (including attorneys' fees) in connection with such Claim. If Contractor has failed to resolve a Claim or provide a bond to protect Owner and any surety against such Claim within thirty (30) days after written notice, Owner or a surety shall have the right to make payment on such Claim out of funds due or to become due Contractor. If no such funds are available, Contractor shall indemnify Owner and surety for all amounts any of them have in good faith paid in discharging any Claim, including any associated costs and expenses (including attorneys' fees).

ARTICLE 14, ARCHITECT'S STATUS DURING CONSTRUCTION

14.1 Representation of Interests of Owner: Architect shall represent the Owner during the construction period pursuant to the Architect's agreement with the Owner and this Article. The duties and responsibilities and the limitations of authority of Architect during construction are set forth in the Contract Documents and will not be changed without written consent of Owner and Architect.

14.2 Visits to Site:

14.2.1 Architect's On-Site Visits: Architect shall visit the site at intervals appropriate to the stage of construction to observe the progress and quality of the executed work and determine, in general, if the work is proceeding in accordance with the contract documents. In carrying out this responsibility the Architect shall make on-site inspections not less than one (1) occasion per week and on the milestone dates for phases of the Project to check the quality and quantity of work on the Project. When

observing the progress of the Project or when making inspections of the work on the Project, the Architect shall not be responsible for the construction means, methods, techniques, sequences, procedures or safety precautions incident thereto. Architect's efforts shall be directed toward Owner identifying non-compliance by the Contractor with the requirements of the contract documents. Architect shall not be responsible for Contractor's failure to perform the construction work in accordance with the contract documents. During such visits and on the basis of Architect's on-site observations as an experienced and qualified design professional, Architect is responsible to inform Owner of the progress of the work, shall alert the Owner to defects and deficiencies in the work of the Contractor and may disapprove or reject work that fails to conform to the contract documents.

14.2.2 Limitation on the Architect's Responsibilities: During or as a result of Architect's visits or observations of Contractor's Work, Architect as the Owner's representative shall not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work.

14.3 Project Representative: [OPTIONAL – APPLICABLE ONLY IF THE BOX IS CHECKED ☐]. If Owner and Architect agree, Architect will furnish a Resident Project Representative to assist Architect in providing more extensive observation of the Work. The responsibilities and authority and limitations thereon of any such Resident Project Representative and assistants will be as provided herein. If Owner designates another representative or agent to represent Owner at the Site who is not Architect's Consultant, agent or employee, the responsibilities and authority and limitations thereon of such other individual or entity will be as provided herein.

14.4 Clarifications and Interpretations: Architect will issue with reasonable promptness such written clarifications or interpretations of the requirements of the Contract Documents as Architect may determine necessary, which shall be consistent with the intent of and reasonably inferable from the Contract Documents, such written clarifications and interpretations will be binding on Owner and Contractor. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times, or both, that should be allowed as a result of a written clarification or interpretation, a Claim may be made therefore as provided in this Agreement.

14.5 Authorized Variations in Work: With Owner's approval the Architect may authorize minor variations in the Work from the requirements of the Contract Documents which do not involve an adjustment in the Contract Price or the Contract Times and are compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. These may be accomplished by a Field Order and will be binding on Owner and also on Contractor, who shall perform the Work involved promptly.

14.6 Rejecting Defective Work: Architect will have authority to disapprove or reject Work which Architect believes to be defective, or that Architect believes will not produce a completed Project that conforms to the Contract Documents or that will prejudice the integrity of the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. Architect will also have authority to require special inspection or testing of the Work at Contractor's cost, whether or not the Work is fabricated, installed, or completed.

14.7 Shop Drawings, Change Orders and Payments:

14.7.1 In connection with Architect's authority as to Shop Drawings and Samples.

14.7.2 In connection with Architect's authority as to Change Orders.

14.7.3 In connection with Architect's authority as to Applications for Payment.

14.8 Decisions on Requirements of Contract Documents and Acceptability of Work:

14.8.1 Architect will be the initial interpreter of the requirements of the Contract Documents and judge of the acceptability of the Work thereunder. Claims, disputes and other matters relating to the acceptability of the Work, the interpretation of the requirements of the Contract Documents pertaining to the performance of the Work, and Claims seeking changes in the Contract Price or Contract Times will be referred initially to Architect in writing, in accordance with the provisions of this Agreement, with a request for a formal decision.

14.8.2 When functioning as interpreter and judge under this paragraph, Architect will not show partiality to Owner or Contractor and will not be liable in connection with any interpretation or decision rendered in good faith in such capacity. The rendering of a decision by Architect pursuant to this paragraph with respect to any such Claim, dispute, or other matter will be a condition precedent to any exercise by Owner or Contractor of such rights or remedies as either may otherwise have under the Contract Documents or by Laws or Regulations in respect of any such Claim, dispute, or other matter.

14.9 Limitations on Architect's Authority and Responsibilities:

14.9.1 Architect will be responsible to the Owner for all duties imposed by Architect's Agreement with Owner. As between the Owner and Contractor, Owner shall be responsible for the Architect's performance of the duties imposed on Architect in this agreement.

14.9.2 Architect will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Architect will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.

14.9.3 Architect will not be responsible for the acts or omissions of Contractor or of any Subcontractor, any Supplier, or of any other individual or entity performing any of the Work.

14.9.4 Architect's review of the final Application for Payment and accompanying documentation and all maintenance and operating instructions, schedules, guarantees, Bonds, certificates of inspection, tests and approvals, and other documentation required to be delivered as part of the Final Payment process will only be to determine generally that their content complies with the requirements of, and in the case of certificates of inspections, tests, and approvals that the results certified indicate compliance with, the Contract Documents.

14.9.5 The limitations upon authority and responsibility set forth in this paragraph shall also apply to Architect's Consultants, Resident Project Representative, and assistants.

ARTICLE 15, CHANGES IN THE WORK

15.1 Authorized Changes in the Work:

15.1.1 Without invalidating the Agreement and without notice to any surety, Architect, with Owner's approval, may at any time or from time to time, order additions, deletions, or revisions in the Work. Upon receipt of appropriate documentation, Contractor shall promptly proceed with the Work involved which will be performed under the applicable conditions of the Contract Documents (except as otherwise specifically provided).

15.1.2 If Owner and Contractor are unable to agree on entitlement to, or on the amount or extent, if any, of an adjustment in the Contract Price or Contract Times, or both, a Claim may be made therefore as provided in the Agreement.

15.2 Unauthorized Changes in the Work: Contractor shall not be entitled to an increase in the Contract Price or an extension of the Contract Times with respect to any work performed that is not required by the Contract Documents as amended, modified, or supplemented and approved by Owner, except in the case of an emergency or in the case of uncovering Work as provided in the Agreement.

15.3 Execution of Change Orders: The Owner, Contractor, and Architect shall execute appropriate Change Orders recommended by the architect covering:

15.3.1 Changes in the Work which are: (i) ordered by Owner, (ii) required because of acceptance of defective Work or Owner's correction of defective Work, or (iii) agreed to by the parties;

15.3.2 Changes in the Contract Price or Contract Times which are agreed to by the parties, including any undisputed sum or amount of time for Work actually performed in accordance with a Work Change Directive; and

15.3.3 Changes in the Contract Price or Contract Times which embody the substance of any written decision rendered by Architect pursuant this Agreement; provided that, in lieu of executing any such Change Order, an appeal may be taken from any such decision in accordance with the provisions of the Contract Documents and applicable Laws and Regulations, but during any such appeal, Contractor shall carry on the Work and adhere to the progress schedule.

15.4 Notification to Surety: If notice of any change affecting the general scope of the Work or the provisions of the Contract Documents (including, but not limited to, Contract Price or Contract Times) is required by the provisions of any Bond to be given to a surety, the giving of any such notice will be Contractor's responsibility. The amount of each applicable Bond will be adjusted to reflect the effect of any such change.

15.5 Written Approval: No work is to be performed in the Change Order Directive until the Change Order document is properly and fully executed by the Contractor, Architect, and Owner and approval of and the funding for the Change Order is received by the School Facilities Division.

ARTICLE 16, CLAIMS

16.1 Notice: Written notice stating the general nature of each Claim, dispute, or other matter shall be delivered by the claimant to Architect and the other party to the Contract within fourteen (14) days after the start of the event giving rise thereto or reasonable discovery of the event. Notice of the amount or extent of the Claim, dispute, or other matter with supporting data shall be delivered to the Architect and the other party to the Contract within thirty (30) days after the start of such event or reasonable discovery of the event (unless Architect allows additional time for claimant to submit additional or more accurate data in support of such Claim, dispute, or other matter). A Claim for an adjustment in Contract Price shall be prepared in accordance with the provisions of this Agreement. A Claim for an adjustment in Contract Time shall be prepared in accordance with the provisions of this Agreement. Each Claim shall be accompanied by claimant's written statement that the adjustment claimed is the entire adjustment to which the claimant believes it is entitled as a result of said event. The opposing party shall submit any response to Architect and the claimant within thirty (30) days after receipt of the claimant's last submittal (unless Architect allows additional time).

16.2 Architect's Decision: Architect will render a formal decision in writing within thirty (30) days after receipt of the last submittal of the claimant or the last submittal of the opposing party, if any.

Architect's written decision on such Claim, dispute, or other matter will be final and binding upon Owner and Contractor unless:

16.2.1 An appeal from Architect's decision is taken within the time limits and in accordance with the dispute resolution procedures set forth in this Agreement; or

16.2.2 If no such dispute resolution procedures have been set forth in Article 16, a written notice of intention to appeal from Architect's written decision is delivered by Owner or Contractor to the other and to Architect within thirty (30) days after the date of such decision, and a formal proceeding is instituted by the appealing party in a forum of competent jurisdiction, within sixty (60) days after the date of such decision or within sixty (60) days after Substantial Completion, whichever is later (unless otherwise agreed in writing by Owner and Contractor), to exercise such rights or remedies as the appealing party may have with respect to such Claim, dispute, or other matter in accordance with applicable Laws and Regulations.

16.3 If Architect does not render a formal decision in writing within the time stated above, a decision denying the Claim in its entirety shall be deemed to have been issued thirty-one (31) days after receipt of the last submittal of the claimant or the last submittal of the opposing party, if any.

16.4 No Claim for an adjustment in Contract Price or Contract Times (or Milestones) will be valid if not submitted in accordance with this Article.

ARTICLE 17, CHANGE OF CONTRACT PRICE; CHANGE OF CONTRACT TIMES; DELAYS

17.1 Change of Contract Price Due to Claims or Change Orders: The Contract Price may only be changed by a Change Order. Approved Changes in the Work or accepted Claims that affect the Contract Price will be addressed through the Change Order process provided in this Agreement. Any adjustment in the Contract Price resulting from a Change in the Work or Claim will be determined as follows:

1.7.1.1 Change Order Form and Supporting Documentation: All requests for a Change Order shall be submitted by the Contractor on the form provided by the Architect. Each request for Change Order shall be accompanied by supporting documentation. Such supporting documentation shall include the following:

17.1.1.1 Labor Costs: Labor costs for employees in the direct employ of Contractor or Contractor's subcontractor actually performing the Work of the Change Order. Such employees shall include without limitation superintendents, foremen, and other personnel employed to perform the work of the Change Order. Labor costs for employees not employed full time on the Work shall be apportioned on the basis of their time spent on the Work. Labor costs shall include, but not be limited to, salaries and wages plus the cost of fringe benefits, which shall include social security contributions, unemployment, excise, and payroll taxes, workers' compensation, health and retirement benefits, bonuses, sick leave, vacation and holiday pay applicable thereto and all transportation, travel, and subsistence expenses. The expenses of performing Work outside of regular working hours, on Saturday, Sunday, or legal holidays, shall be included in the above to the extent authorized by Owner.

17.1.1.2 Material and Equipment Cost: Cost of all materials and equipment furnished and incorporated in the Work, including costs of transportation and storage thereof, and Suppliers' field services required in connection therewith, cost for additional bonds, insurance, sales taxes. All cash discounts shall accrue to Contractor unless Owner deposits funds with Contractor with which to make payments, in which case the cash discounts shall accrue to Owner.

17.1.1.3 Contractor's Fee for Overhead and Profit: Contractor's fee for overhead and profit shall be determined as follows:

17.1.1.3.1 A mutually acceptable fixed fee; or

17.1.1.3.2 If a fixed fee is not agreed upon, then the Contractor's Fee for Overhead and Profit shall be based upon the schedule provided in the paragraphs below:

- .1 For the contractor, for work performed by the contractor's own forces, a maximum of, five (5%) percent of the cost.
- .2 For the contractor, for work performed by the contractor's subcontractor, a maximum of, five (5%) percent of the amount due the subcontractor.
- .3 For each subcontractor or subcontractor involved, for work performed by the subcontractor's or sub-subcontractor's own forces, a maximum of, five (5%) percent of the cost.
- .4 For each Subcontractor, for Work performed by the Subcontractor's Sub-subcontractors, a maximum of, five percent (5%) of the amount due the Subcontractor.
- .5 Cost to which overhead and profit is to be applied shall be determined in accordance with the paragraph below.
- .6 In order to facilitate checking of quotations for extras or credits, all proposals, except those so minor that their propriety can be seen by inspection, shall be accompanied by a complete 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.
- .7 Under no circumstances shall the total mark up to the Owner exceed ten (10%) percent of the cost.

17.1.2 Negotiation of Cost of Change Order: The Owner, in consultation with the Architect, will negotiate the method of calculation of the cost of a Change Order as follows:

17.1.2.1 Increase in Contract Price: The method of calculating the increase in the Cost of the Work resulting from a Change Order shall be as follows:

17.1.2.1.1 Lump Sum: By a mutually agreed lump sum (which may include overhead and profit not necessarily in accordance with the provisions for Contractor's fee for overhead and profit below); or

17.1.2.1.2 Cost of the Work Plus Fee: Where an agreement to a lump sum is not reached the adjustment shall be determined on the basis of the Cost of the Work plus a Contractor's fee for overhead and profit (determined as provided in the provisions for calculation and verification of the Cost of the Work and Contractor's fee for overhead and profit above).

17.1.2.2 Decrease in the Contract Price: The method of calculating the decrease in the Cost of the Work and Contract Price resulting from a Change Order shall be the amount of the actual net decrease in the Cost of the Work plus an amount equal to five percent (5%) of the amount of such net decrease to compensate the Contractor for the Contractor's overhead a profit as a result of the decrease in the Cost of the Work and Contract Price.

17.1.2.3 Net Increase/Decrease in the Contract Price: When both increases and decreases are involved in any one (1) Change Order, the adjustment in Contract Price shall be calculated on the basis of the net change (increase or decrease in the Cost of the Work and Contract Price) in accordance with this section.

17.1.3 Subcontractors for the Work of Change Orders: When the Change Order requires or allows for the subcontracting of the Work independent of current subcontractors, the Contractor shall obtain competitive bids from subcontractors acceptable to Owner and Contractor and shall deliver such bids to Owner, who will then determine, with the advice of Architect, which bids, if any, will be acceptable. If any subcontract provides that the Subcontractor is to be paid on the basis of Cost of the Work plus a fee, the Subcontractor's Cost of the Work and fee shall be determined in the same manner as Contractor's Cost of the Work and fee as provided in this Article.

17.1.3.1 Contractor shall not employ any such Subcontractor, Supplier, or other individual or entity, whether initially or as a replacement, against whom Owner may have reasonable objection. Contractor shall not be required to employ any Subcontractor, Supplier, or other individual or entity to furnish or perform any of the Work against whom Contractor has reasonable objection.

17.1.3.2 Contractor shall identify all such Subcontractors, Suppliers, or other individuals or entities in advance for acceptance by Owner as required in the bid documents, and Owner's acceptance (either in writing or by failing to make written objection thereto by the date indicated for acceptance or objection in the Bidding Documents or the Contract Documents) of any such Subcontractor, Supplier, or other individual or entity so identified may be revoked on the basis of reasonable objection after due investigation. Contractor shall submit an acceptable replacement for the rejected Subcontractor, Supplier, or other individual or entity, and the Contract Price will be adjusted by the difference in the cost occasioned by such replacement, and an appropriate Change Order will be issued or Written Amendment. No acceptance by Owner of any such Subcontractor, Supplier, or other individual or entity, whether initially or as a replacement, shall constitute a waiver of any right of Owner or Architect to reject defective Work.

17.2 Change of Contract Times:

17.2.1 The Contract Times (or Milestones) may only be changed by a Change Order. Approved Changes in the Contract Times or accepted Claims that affect the Contract Times will be addressed through the Change Order process provided in this Agreement.

17.2.2 Any adjustment of the Contract Times (or Milestones) covered by a Change Order or of any Claim for an adjustment in the Contract Times (or Milestones) will be determined in accordance with the provisions of this Article.

17.3 Delays Within Contractor's Control: Where Contractor is prevented from completing any part of the Work within the Contract Times (or Milestones) due to delay within the control of the Contractor, Contractor shall not be granted an extension of Contract Times (or Milestones) or amendment of the contract or contract price for additional cost of the Project due to such delay in the Work. Delays attributable to and within the control of a Subcontractor or Supplier shall be deemed to be delays within the control of Contractor.

17.4 Delays Beyond Contractor's Control:

17.4.1 Delays Due to Adverse Weather Conditions: Contractor shall be responsible to consider and include within the Contract Price the climatic conditions of the location of the Project that may delay the Work, and Contractor shall not be granted an extension of Contract Times (or Milestones) or amendment of the contract or contract price for the additional cost of the Project due to a delay in the Work resulting in whole or in part from adverse weather conditions.

17.4.2 Delays Other Than Adverse Weather Conditions: Where Contractor is prevented from completing any part of the Work within the Contract Times (or Milestones) due to delay beyond the control of Contractor for reasons other than adverse weather conditions, Contractor shall be granted an

extension of Contract Times (or Milestones) and/or amendment of the contract or contract price for additional cost of the Project as provided in this Agreement.

17.5 Delays Beyond Owner's and Contractor's Control: Where Contractor is prevented from completing any part of the Work within the Contract Times (or Milestones) due to delay beyond the control of both Owner and Contractor, Contractor shall be granted an extension of Contract Times (or Milestones) and/or amendment of the contract or contract price for additional cost of the Project as provided in this Agreement.

17.6 Delay Damages:

17.6.1 Delays Caused by Contractor: In no event shall Owner or Architect be liable to Contractor, any Subcontractor, any Supplier, or any other person or organization, or to any surety for or employee or agent of any of them, for damages arising out of or resulting from delays caused by or within the control of Contractor;

17.6.2 Delays Caused by the Owner, Third Parties, or Acts of God: Delays beyond the control of Contractor shall include acts or neglect by Owner, Architect, acts or neglect of third parties or other contractors performing other work, fires, floods, tornados, epidemics, or acts of God.

17.6.2.1 Increase in Contract Time and Cost:

17.6.2.1.1 Written Notice to Owner of Delay: Where Contractor wishes to make Claim for an increase in the Contract Times (or Milestones) and/or amendment of the contract or contract price for additional cost of the Project due to a delay in the Work, written notice shall be prepared and delivered by the Contractor to the Owner within seven (7) days of the beginning of the delay and shall include a narrative of the cause of the delay, the effect of the delay on the progress of the work set forth on the CPM Schedule, the anticipated duration of the delay, and the estimated cost of the delay.

17.6.2.1.2 Time of Submission of Claim for Increase in Contract Time and Cost: A Claim for an increase in the Contract Times (or Milestones) and/or amendment of the contract or contract price for additional cost of the Project due to a delay in the Work shall be submitted within thirty (30) days of the last date of the claimed delay.

17.6.2.1.3 Content of Contractor's Claim: Contractor's Claim shall be based upon, and limited to, the actual cost without mark-up to the Contractor of the delay and of probable effect of delay on progress of the Work. In the case of a continuing delay only one (1) claim is necessary. No extension of time shall be granted because of hindrances or delays from any cause which is the fault of Contractor or Contractor's Subcontractors or under Contractor's control.

17.6.2.2 Provisions of Article Fair and Adequate: Contractor represents and warrants that the provisions herein contained for extension of time and adjustment of the contract or of the contract price pursuant to this Article are fair and adequate and that Contractor has an opportunity to make provision for any and all delays within the contemplation of the parties. Accordingly, it is understood and agreed that Contractor shall not have or assert any claim for damages or prosecute any suit, action, cause of action, arbitration claim, or other proceeding against the Owner for such damages arising from any delay or hindrance in the completion of the Work called for in this Agreement except as provided in this paragraph.

ARTICLE 18, TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK

18.1 Notice of Defects: Prompt notice of all defective Work of which Owner or Architect has actual knowledge will be given to Contractor. All defective Work may be rejected, corrected, or accepted as provided herein.

18.2 Access to Work: Owner, Architect, Architect's Consultants, other representatives and personnel of Owner, independent testing laboratories, and governmental agencies with jurisdictional interests shall have access to the Site and the Work at reasonable times for their observation, inspecting, and testing. Contractor shall provide them proper and safe conditions for such access and advise them of Contractor's Site safety procedures and programs so that they may comply therewith as applicable.

18.3 Tests and Inspections: Contractor shall give the Architect timely notice of readiness of the Work for all required inspections, tests, or approvals prior to covering the Work, if applicable, and shall cooperate with inspection and testing personnel to facilitate required inspections or tests.

18.3.1 Owner Paid Tests and Inspections: Owner shall employ and pay for the services of an independent testing laboratory to perform all inspections, tests, or approvals required of the Owner by the Contract Documents.

18.3.2 Contractor Paid Tests and Inspections: Contractor shall be responsible for arranging and obtaining and shall pay all costs in connection with any inspections, tests, or approvals required of the Contractor by the Contract Documents. Such inspections, tests, or approvals shall be performed by organizations acceptable to Owner and Architect. If any Work (or the work of others) that is to be inspected, tested, or approved is covered by Contractor without written concurrence of Architect, Contractor shall at Contractor's cost, if requested by Architect, be uncovered for observation unless Contractor has given Architect timely notice of Contractor's intention to cover the same and Architect has not acted with reasonable promptness in response to such notice.

18.4 Uncovering Work: If Owner or Architect determines that it is necessary or advisable that covered Work be observed by Owner and/or Architect or inspected or tested by others, Contractor, at Owner's or Architect's request, shall uncover, expose, or otherwise make available for observation, inspection, or testing as Owner or Architect may require, that portion of the Work in question, furnishing all necessary labor, material, and equipment. If it is found that such Work is defective, Contractor shall pay all Claims, costs, losses, and damages (including but not limited to all fees and charges of Architects, Architect's consultants, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such uncovering, exposure, observation, inspection, and testing, and of satisfactory replacement or reconstruction (including but not limited to all costs of repair or replacement of work of others); and Owner shall be entitled to an appropriate decrease in the Contract Price. If, however, such Work is not found to be defective, Contractor shall be allowed an increase in the Contract Price or an extension of the Contract Times (or Milestones), or both, directly attributable to such uncovering, exposure, observation, inspection, testing, replacement, and reconstruction.

18.5 Stopping the Work: If the Work is defective, or Contractor fails to supply sufficient skilled workers or suitable materials or equipment, or fails to perform the Work in such a way that the completed Work will conform to the Contract Documents, Owner may order Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, this right of Owner to stop the Work shall not give rise to any duty on the part of Owner to exercise this right for the benefit of Contractor, any Subcontractor, any Supplier, any other individual or entity, or any surety for, or employee or agent of any of them.

18.6 Correction or Removal of Defective Work: Contractor shall correct all defective Work, whether or not fabricated, installed, or completed, or, if the Work has been rejected by Owner or Architect, remove it from the Project and replace it with Work that is not defective. Contractor shall pay all Claims, costs, losses, and damages (including but not limited to all fees and charges of Architect, Architect's Consultants, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or removal (including but not limited to all costs of repair or replacement of work of others).

18.7 Correction Period: If within one (1) year after the date of Substantial Completion or such longer period of time as may be prescribed by Laws or Regulations or by the terms of any applicable special guarantee required by the Contract Documents or by any specific provision of the Contract Documents, any Work is found to be defective, or if the repair of any damages to the land or areas made available for Contractor's use by Owner or permitted by Laws and Regulations is found to be defective, Contractor shall promptly, without cost to Owner and in accordance with Owner's written instructions: (i) repair such defective land or areas, or (ii) correct such defective Work or, if the defective Work has been rejected by Architect and/or Owner, remove it from the Project and replace it with Work that is not defective, and (iii) satisfactorily correct or repair or remove and replace any damage to other Work, to the work of others or other land or areas resulting therefrom. If Contractor does not promptly comply with the terms of such instructions, or in an emergency where delay would cause serious risk of loss or damage, Owner may have the defective Work corrected or repaired or may have the rejected Work removed and replaced, and all Claims, costs, losses, and damages (including but not limited to all fees and charges of Architect, Architect's Consultants, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or repair or such removal and replacement (including but not limited to all costs of repair or replacement of work of others) will be paid by Contractor. In special circumstances where a particular item of equipment is placed in continuous service before Substantial Completion of all the Work, the correction period for that item may start to run from an earlier date if so provided in the Specifications or by Written Amendment. Where defective Work (and damage to other Work resulting therefrom) has been corrected or removed and replaced, the correction period hereunder with respect to such Work will be extended for an additional period of one (1) year after such correction or removal and replacement has been satisfactorily completed. Contractor's obligations under this paragraph are in addition to any other obligation or warranty. The provisions of this paragraph shall not be construed as a substitute for or a waiver of the provisions of any applicable statute of limitation or repose. Contractor shall confirm that its payment and performance bond provides coverage for all corrective work during the Correction Period.

18.8 Acceptance of Defective Work: If, instead of requiring correction or removal and replacement of defective Work, Owner (and, prior to Architect's recommendation of final payment) prefers to accept such defective Work, Owner may do so. Contractor shall pay all Claims, costs, losses, and damages (including but not limited to all fees and charges of Architect, Architect's Consultants, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) attributable to Owner's evaluation of and determination to accept such defective Work (such costs to be approved by Architect as to reasonableness) and the diminished value of the Work to the extent not otherwise paid by Contractor pursuant to this sentence. If any such acceptance occurs prior to Architect's recommendation of final payment, a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work, and Owner shall be entitled to an appropriate decrease in the Contract Price, reflecting the diminished value of Work so accepted. If the acceptance occurs after such recommendation, an appropriate amount will be paid by Contractor to Owner.

18.9 Owner May Correct Defective Work: In the event the Architect determines that the Contractor's work is defective, the Architect shall give the Contractor notice to correct the defective work. Contractor shall within seven (7) days after written notice from Architect correct defective Work or remove and replace rejected Work as required by Architect. If the Contractor fails to correct the defective work in accordance with this paragraph, or if Contractor fails to perform the Work in accordance with the Contract Documents within such time, or if Contractor fails to comply with any other provision of the Contract Documents, Owner may, upon seven (7) days written notice to Contractor, correct and remedy any such deficiency. In exercising the rights and remedies under this paragraph, Owner shall proceed expeditiously. In connection with such corrective and remedial action, Owner may exclude Contractor from all or part of the Site, take possession of all or part of the Work and

suspend Contractor's services related thereto, and incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere. Contractor shall allow Owner, Owner's representatives, agents and employees, Owner's other contractors, and Architect and Architect's Consultants access to the Site to enable Owner to exercise the rights and remedies under this paragraph. All Claims, costs, losses, and damages (including but not limited to all fees and charges of Architect, Architect's Consultant, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) incurred or sustained by Owner in exercising the rights and remedies under this paragraph will be charged against Contractor, and a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work; and Owner shall be entitled to an appropriate decrease in the Contract Price. Such claims, costs, losses and damages will include but not be limited to all costs of repair, or replacement of work of others destroyed or damaged by correction, removal, or replacement of Contractor's defective Work. Contractor shall not be allowed an extension of the Contract Times (or Milestones) because of any delay in the performance of the Work attributable to the exercise by Owner of Owner's rights and remedies under this paragraph.

ARTICLE 19, PAYMENTS TO CONTRACTOR AND COMPLETION

19.1 Schedule of Values: Contractor's Schedule of Values will serve as the basis for progress payments and will be incorporated into a form of Application for Payment acceptable to Architect and Owner. Progress payments on account of Unit Price Work will be based on the number of units completed.

19.2 Progress Payments:

19.2.1 Applications for Payment: Contractor shall submit to Owner and, if directed, Architect, a periodic Application for Payment. The Application for Payment shall consist of the cost of the Project as set forth in the Schedule of Values. Approval of Application for Payments for such materials stored off-site shall be conditioned upon submission by Contractor of bills of sale and applicable insurance or such other procedures satisfactory to Owner to establish Owner's title to such materials, or otherwise to protect Owner's interest, including transportation to the Worksite. The extent of such statement shall be as agreed upon between Owner and Contractor. Payment shall be subject to the retainage requirements of Wyo. Stat. § 16-6-702. If an interest bearing account per Wyo. Stat. § 16-6-704 is established the account holders shall include the District, and Contractor. The Owner, Architect and Contractor will set a schedule for Submittal and Approval of Pay Applications to be followed during the preconstruction meeting.

19.2.2 Owner's Acceptance or Rejection of Applications: Promptly after receipt of each periodic Application for Payment, Architect and Owner shall certify acceptance of the application, in whole or in part, by the signing of the Architect's Certification of Payment section of the Application for Payment form, and upon such certification shall forward the application to the SFD for funding. Pursuant to Wyo. Stat. § 16-6-602, Except as provided by contract, any agency which purchases or procures goods and services from a nongovernmental entity shall pay the amount due within forty-five (45) days after receipt of a correct notice of amount due for the goods or services provided or shall pay interest from the forty-fifth day at the rate of one and one-half percent (1 1/2%) per month on the unpaid balance until the account is paid in full, unless a good faith dispute exists as to the agency's obligation to pay all or a portion of the account.

19.2.2.1 Good Faith Dispute Regarding Application for Payment: If a good faith dispute exists as to the Owner's obligation to pay all or a portion of the amount requested in the Application for Payment and such application is rejected in whole or in part, Architect and Owner shall indicate the reasons for its rejection, and the remedial actions to be taken by Contractor in order to receive payment. When the above reasons for disapproving or nullifying an application for payment are removed, payment will be

promptly made for the amount previously withheld. If Architect and Owner and Contractor cannot agree on a revised amount then, within fifteen (15) business days after its initial rejection in part of such application, Owner shall pay directly to Contractor the certified amount for those items not rejected by Owner for which application for payment is made, less amounts previously paid by Owner and required retention. Those items rejected by Owner shall be paid by the Owner to the extent determined appropriate (1) when the reasons for the rejection have been removed, or (2) when the reasons for the rejection have been resolved through the alternative dispute resolution process as provided herein.

19.2.3 Lien Waivers and Liens:

19.2.3.1 PARTIAL LIEN WAIVERS AND AFFIDAVITS If requested by Owner, as a prerequisite for payment, Contractor shall provide partial lien and claim waivers in the amount of the Application for Payment and affidavits from its Subcontractors and Material Suppliers for the completed Work. Such waivers shall be conditional upon payment. In no event shall Contractor be required to sign an unconditional waiver of lien or claim, either partial or final, prior to receiving payment or in an amount in excess of what it has been paid.

19.2.3.2 Responsibility for Liens: If Owner has made payments in the time required by this agreement, Contractor shall, within thirty (30) days after filing, cause the removal of any liens filed against the premises or public improvement fund by any party or parties performing labor or services or supplying materials in connection with the Work. If Contractor fails to take such action on a lien, Owner may cause the lien to be removed at Contractor's expense, including bond costs and reasonable attorneys' fees.

19.2.3.3 Adjustment of General Contractor's Application for Payment: Owner may adjust or reject an Application for Payment or nullify a previously approved Application for Payment, in whole or in part, as may reasonably be necessary to protect Owner from loss or damage based upon the following, to the extent that Contractor is responsible under the Agreement:

19.2.3.3.1 Contractor's repeated failure to perform the Work as required by the Contract Documents;

19.2.3.3.2 Loss or damage arising out of or relating to this Agreement and caused by Contractor to Owner or others to whom Owner may be liable;

19.2.3.3.3 Contractor's failure to properly pay subcontractors and material suppliers following receipt of such payment from Owner;

19.2.3.3.4 Third-party claims involving Contractor or reasonable evidence demonstrating that third-party claims are likely to be filed unless and until Contractor furnishes Owner with adequate security in the form of a surety bond, irrevocable letter of credit or other collateral or commitment satisfactory to Owner and sufficient to discharge such claims if established.

19.2.4 Acceptance of Work: Neither Owner's payment of progress payments nor its partial or full use or occupancy of the Project constitutes acceptance of Work not complying with the Contract Documents.

19.3 Substantial Completion:

19.3.1 Contractor shall notify the Architect when it considers that Substantial Completion of the Work or a designated portion to have been achieved. Architect shall promptly conduct an inspection to determine whether the Work or designated portion can be occupied or utilized for its intended use by Owner without excessive interference in completing any remaining unfinished Work by Contractor. If Architect and Owner determine that the Work or designated portion has not reached Substantial Completion, Owner, with the assistance of the Architect shall promptly compile a list of items to be

completed or corrected so Owner may occupy or utilize the Work or designated portion for its intended use. Contractor shall promptly complete all items on the list.

19.3.2 When Substantial Completion of the Work or a designated portion is achieved, the Architect shall prepare and deliver to Owner and Contractor a Certificate of Substantial Completion that shall establish the date of Substantial Completion and the respective responsibilities of Owner and Contractor for interim items such as security, maintenance, utilities, insurance and damage to the Work, and fixing the time for completion of all items on the list accompanying the Certificate. In the absence of a clear delineation of responsibilities, Owner shall assume all responsibilities for items such as security, maintenance, utilities, insurance and damages to the Work. The Certificate of Substantial Completion shall be submitted by the Architect to Owner, for Owner's written acceptance of responsibilities assigned in the Certificate.

19.3.3 Unless otherwise provided in the Certificate of Substantial Completion, warranties required by the Contract Documents shall commence on the date of Substantial Completion of the Work or a designated portion.

19.4 Partial Occupancy or Use: Owner may occupy or use completed or partially completed portions of the Work when (i) the portion of the Work is designated in a Certificate of Substantial Completion, (ii) appropriate insurer(s) consent to the occupancy or use, and (iii) public authorities authorize the occupancy or use. Such partial occupancy or use shall constitute Substantial Completion of that portion of the Work. Owner shall not unreasonably refuse to accept partial occupancy.

19.5 Final Completion and Final Payment:

19.5.1 Final Inspection: Upon notification from Contractor that the Work is complete and ready for final inspection and acceptance, Architect, in consultation with the Owner authorized representative, shall promptly conduct a final inspection to determine if the Work has been completed and is acceptable under the Contract Documents.

19.5.2 Final Application for Payment: When the Work is complete, Contractor shall prepare for Owner's acceptance a final Application for Payment stating that to the best of Contractor's knowledge, and based on Owner's inspections, the Work has reached Final Completion in accordance with the Contract Documents.

19.5.3 Wyo. Stat. § 16-6-116 Requirements: Final payment shall be made to Contractor after Contractor has submitted an application for final payment, including Final Payment Submissions, and a Certificate of Final Completion has been executed by Owner and Contractor. Such final payment shall be subject to the requirement of Wyo. Stat. § 16-6-116 providing for the publication in a newspaper of general circulation published nearest the point at which the Work is being carried on, once a week for three (3) consecutive weeks, and also post in three (3) conspicuous places on the Work, a notice setting forth in substance, that Owner has accepted the Work as completed according to the plans and specifications and rules set forth in this Agreement between Owner and Contractor, and that Contractor is entitled to final payment. The notice shall also set forth that upon the 41st day, with the notice specifying the exact date) after the first publication of the notice Owner will pay to Contractor the full amount due under the contract.

19.5.4 Final Payment Submissions: Final payment shall be due on Contractor's submission of the following to Owner:

19.5.4.1 An affidavit declaring any indebtedness connected with the Work, e.g. payrolls or invoices for materials or equipment, to have been paid, satisfied or to be paid with the proceeds of final payment, so as not to encumber Owner's property;

19.5.4.2 As-built drawings, manuals, copies of warranties and all other close-out documents required by the Contract Documents;

19.5.4.3 Release of any liens, conditioned on final payment being received;

19.5.4.4 Consent of any surety; and

19.5.5 Final Completion delayed – No Fault of Contractor: If, after Substantial Completion of the Work, the Final Completion of a portion of the Work is materially delayed through no fault of Contractor, Owner shall pay the balance due for portion(s) of the Work fully completed and accepted. If the estimated cost of the Work not fully completed and accepted is less than the retained amount prior to payment, Contractor shall submit to Owner, and if directed, to the Architect, the written consent of any surety to payment of the balance due for portions of the Work that are fully completed and accepted. Such payment shall not constitute a waiver of claims.

19.5.6 Claims Not Reserved in Writing: Claims not reserved in writing with the making of final payment shall be waived except for claims relating to liens or similar encumbrances, warranties and Defective Work.

19.5.7 Acceptance of Final Payment: Unless Contractor provides written identification of unsettled claims known to Contractor at the time of making application for final payment, acceptance of final payment constitutes a waiver of such claims.

19.6 Contractor's Warranty of Title: Contractor warrants and guarantees that title to all Work, materials, and equipment covered by any Application for Payment, whether incorporated in the Project or not, will pass to Owner no later than the time of payment free and clear of all Liens.

19.7 Accounting Records: The Contractor shall keep full, detailed accounts and exercise such controls as may be necessary for proper financial management under this Contract. The accounting and control systems shall be satisfactory to the Owner. The Owner, the Owner's accountants and SFD, or other representatives, shall be afforded access to the Contractors records, books, correspondence, instructions, drawings, receipts, Subcontracts, purchase orders, vouchers, memoranda and other data relating to this Project, and the Contractors shall preserve these for a period of four (4) years after final payment or for such longer period as may be required by law.

ARTICLE 20, SUSPENSION OF WORK AND TERMINATION

20.1 Owner May Suspend Work: At any time and without cause, Owner may suspend the Work or any portion thereof for a period of not more than ninety (90) consecutive days by notice in writing to Contractor and Architect which will fix the date on which Work will be resumed. Contractor shall resume the Work on the date so fixed. Contractor shall be allowed an adjustment in the Contract Price or an extension of the Contract Times, or both, directly attributable to any such suspension if Contractor makes a Claim therefor as provided in this Agreement.

20.2 Owner May Terminate for Cause: The occurrence of any one or more of the following events will justify termination for cause:

20.2.1 Contractor's persistent failure to perform the Work in accordance with the Contract Documents (including, but not limited to, failure to supply sufficient skilled workers or suitable materials or equipment or failure to adhere to the progress schedule as adjusted from time to time);

20.2.2 Contractor's disregard of federal, state or local laws, regulations, or ordinances, School District policies, or of any public body having jurisdiction;

20.2.3 Contractor's disregard of the authority of Architect; or

20.2.4 Contractor's violation in any substantial way of any provisions of the Contract Documents.

20.2.5 If one or more of the events identified in subparagraphs 1 through 4 above occur, Owner may, after giving Contractor (and the surety, if any) seven (7) days written notice, terminate the services of Contractor, exclude Contractor from the Site, incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere, and finish the Work as Owner may deem expedient. In such case, Contractor shall not be entitled to receive any further payment until the Work is finished. If the unpaid balance of the Contract Price exceeds all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by Owner arising out of or relating to completing the Work, such excess will be paid to Contractor. If such claims, costs, losses, and damages exceed such unpaid balance, Contractor shall pay the difference to Owner. Such claims, costs, losses, and damages incurred by Owner will be reviewed by Architect as to their reasonableness and, when so approved by Engineer, incorporated in a Change Order. When exercising any rights or remedies under this paragraph Owner shall not be required to obtain the lowest price for the Work performed.

20.2.6 Where Contractor's services have been so terminated by Owner, the termination will not affect any rights or remedies of Owner against Contractor then existing or which may thereafter accrue. Any retention or payment of moneys due Contractor by Owner will not release Contractor from liability.

20.3 Owner May Terminate For Convenience:

20.3.1 Upon seven (7) days written notice to Contractor and Architect, Owner may, without cause and without prejudice to any other right or remedy of Owner, elect to terminate the Contract. In such case, Contractor shall be paid (without duplication of any items):

20.3.1.1 For completed and acceptable Work executed in accordance with the Contract Documents prior to the effective date of termination, including fair and reasonable sums for overhead and profit on such Work;

20.3.1.2 For expenses sustained prior to the effective date of termination in performing services and furnishing labor, materials, or equipment as required by the Contract Documents in connection with uncompleted Work, plus fair and reasonable sums for overhead and profit on such expenses;

20.3.1.3 For all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) incurred in settlement of terminated contracts with Subcontractors, Suppliers, and others; and

20.3.1.4 For reasonable expenses directly attributable to termination.

20.3.2 Contractor shall not be paid on account of loss of anticipated profits or revenue or other economic loss arising out of or resulting from such termination.

20.4 Contractor May Stop Work or Terminate: If, through no act or fault of Contractor, the Work is suspended for more than ninety (90) consecutive days by Owner or under an order of court or other public authority, or Architect fails to act on any Application for Payment within forty-five (45) days after it is submitted, or Owner fails for forty-five (45) days to pay Contractor any sum finally determined to be due, then Contractor may, upon seven (7) days written notice to Owner and Architect, and provided Owner or Architect do not remedy such suspension or failure within that time, terminate the Contract and recover from Owner payment on the same terms as provided in paragraph 19.2.2. In lieu of terminating the Contract and without prejudice to any other right or remedy, if Architect has failed to act on an Application for Payment within forty-five (45) days after it is submitted, or Owner has failed

for forty-five (45) days to pay Contractor any sum finally determined to be due, Contractor may, seven (7) days after written notice to Owner and Architect, stop the Work until payment is made of all such amounts due Contractor, including interest thereon. The provisions of this paragraph are not intended to preclude Contractor from making a Claim under this Agreement, for an adjustment in Contract Price or Contract Times or otherwise for expenses or damage directly attributable to Contractor stopping the Work as permitted by this paragraph.

ARTICLE 21, DISPUTE RESOLUTION

21.1 Litigation: Absent agreement of Owner and Contractor, disputes that cannot be resolved through negotiations shall be subject to litigation in a court of competent jurisdiction in the State of Wyoming.

21.2 No Mandatory Arbitration: Notwithstanding anything to the contrary in this Agreement, or in any document forming a part hereof, there shall be no mandatory arbitration for any dispute arising hereunder.

21.3 Alternative Dispute Resolution: The parties may by mutual agreement endeavor to settle disputes by mediation. Any mediation conducted pursuant to this paragraph shall be held in accordance with the Construction Industry Mediation Rules of the American Arbitration Association currently in effect, unless the parties mutually agree otherwise. A request for mediation shall be filed in writing with the other party to this Agreement. Any demand for mediation shall be made within a reasonable time after the claim, dispute or other matter in question has arisen. In no event shall the demand for mediation be made after the date when institution of legal or equitable proceedings based upon such claim, dispute or other matter in question would be barred by the applicable statute of limitations.

ARTICLE 22, ASSIGNMENT OF THE CONTRACT

22.1 Assignment: Once this Agreement is accepted and signed by Owner, Owner and Contractor respectively bind themselves, their partners, successors, assigns and legal representatives to the other party hereto and to partners, successors, assigns and legal representatives of such other party in respect to covenants, agreements and obligations contained in the Contract Documents. No party to the Contract shall assign the Contract as a whole without the written consent of the others. If any party attempts to make such an assignment without such consent, that party shall nevertheless remain legally responsible for all obligations under the Contract.

22.2 Prohibition of Assignment of Contract by Contractor: Contractor shall not assign the Work of this Agreement without the written consent of Owner, nor subcontract the whole of this Agreement without the written consent of Owner, nor further subcontract portions of this Agreement without written notification to Owner. All Sub-subcontracts or Purchase Orders shall allow assignment to Owner in the event of termination for cause.

22.3 Assignment of Funds: Contractor shall not assign any of the funds to be received under or through this Agreement unless such Assignment has the written approval of Owner. In order to be so approved, any such assignment shall include the following language: "It is agreed the funds to be paid to the Assignee under this Assignment are subject to satisfactory performance of the Agreement under which this Assignment is made ("this Agreement") by the Assignor ("Contractor") and subject to payment of all invoices, bills, claims, or liens for services rendered or materials supplied for the performance of any portion of the Work called for in this Agreement with Owner or any other Contract between Owner and Contractor. Owner reserves the right to set-off against any funds which may be

due Contractor by Owner or funds to be paid the Assignee the amount of a claim or liens arising under or through this or any other Agreement with Contractor.

ARTICLE 23, MISCELLANEOUS PROVISIONS

23.1 Warranty of Examination of Construction Documents and Duty to Update Provided Information:

By signing this Agreement, Contractor does hereby agree, certify, warrant and represent on behalf of itself, and agrees to see that each Subcontractor performing the Work shall also agree, certify, warrant and represent to Owner that their bids have been based on a full and complete examination of the Construction Documents, including as determined necessary site examination; and that all statements, facts and representations made in all submittal documents and materials are true, correct, accurate, and complete, and may be relied upon by Owner in considering the firm's bid. Contractor understands it is its responsibility to immediately provide updated and correct information if any of the information changes at any time. Any omission, falsification or misrepresentation made by Contractor in such documents and materials or any supplement thereto, will be sufficient grounds for failure to employ Contractor or terminate any contract with Owner. Contractor by entering into an Agreement with Owner consents and agrees to comply at all times with all Owner policies, regulations, directives, and practices.

23.2 Extent of Contract: This Contract which includes this Agreement and the other documents incorporated herein by reference represents the entire and integrated Agreement between Owner and Contractor and supersedes all prior negotiations, representations or agreements, either written or oral. This Agreement may be amended only by written instrument signed by Owner and Contractor. If anything in any document incorporated into this Agreement is inconsistent with this Agreement, this Agreement shall govern.

23.3 Ownership and Use of Documents: The Drawings, Specifications and other documents prepared by the Project Architect and copies thereof furnished to Contractor are for use solely with respect to this Project. They are not to be used by Contractor, Subcontractors, Sub-subcontractors or suppliers on other projects, or for additions to this Project outside the scope of the Work, without the specific written consent of Owner and Project Architect. The Subcontractors, Sub-subcontractors and suppliers are granted a limited license to use and reproduce applicable portions of the Drawings, Specifications and other documents prepared by the Project Architect appropriate to and for use in the execution of their Work under the Contract Documents.

23.4 Governing Law: The Contract shall be governed by the laws of the State of Wyoming and any litigation shall be conducted in state district court. Mandatory and exclusive venue for any dispute shall be **Choose County**, Wyoming, or, if no county is specified, then in the county in which the District's main administrative office is located.

23.5 Force Majeure: None of the parties hereto shall be liable for failure to perform under this Contract if such failure to perform arises out of causes beyond the control and without the fault or negligence of the nonperforming party. Such causes may include, but are not limited to, acts of God or the public enemy, fires, floods, epidemics, quarantine restrictions, freight embargoes, and unusually severe weather. This provision shall become effective only if the party failing to perform immediately notifies the other party of the extent and nature of the problem, limits delay in performance to that required by the event, and takes all reasonable steps to minimize delays. This provision shall not be effective unless the failure to perform is beyond the control and without the fault or negligence of the nonperforming party.

23.6 Independent Contractor: Contractor shall function as an independent contractor for the purposes of this Contract and shall not be considered an employee of Owner or the State of Wyoming for any purpose. Contractor shall assume sole responsibility for any debts or liabilities that may be

incurred by Contractor in fulfilling the terms of this Contract and shall be solely responsible for the payment of all federal, state, and local taxes which may accrue because of this Contract. Nothing in this Contract shall be interpreted as authorizing Contractor or its agents and/or employees to act as an agent or representative of or on behalf of the State of Wyoming or Owner, or to incur any obligation of any kind on behalf of the State of Wyoming or Owner. Contractor agrees that no health/hospitalization benefits, workers' compensation, and/or similar benefits available to Owner or State of Wyoming employees will extend to the benefit of Contractor or Contractor's agents and/or employees as a result of this Contract.

23.7 Kickbacks: Contractor certifies and warrants that no gratuities, kickbacks, or contingency fees were paid in connection with this Contract, nor were any fees, commissions, gifts, or other considerations made contingent upon the award of this Contract. If Contractor breaches or violates this warranty, Owner may, at its discretion, terminate this Contract without liability to Owner, or deduct from the Contract price or consideration, or otherwise recover the full amount of any commission, percentage, brokerage, or contingency fee.

23.8 Notices: All notices or invoices arising out of, or from, the provisions of this Contract shall be in writing and given to the parties at the address provided under this Contract, either by regular mail, facsimile, e-mail, or delivery in person. All notices sent via the U.S. Postal Service are deemed effective on the date of postmark. Notices and invoices mailed through another carrier (e.g., UPS or FedEx) are effective upon receipt.

23.9 Severability: This Agreement is subject to all applicable federal and state laws, rules, and regulations. Should any portion of this Contract be judicially determined to be illegal or unenforceable, the remainder of this Contract shall continue in full force and effect, and either party may attempt to renegotiate the terms affected by the severance.

23.10 No Waiver of Rights: The waiver of any breach of any term or condition in this Contract shall not be deemed a waiver of any prior or subsequent breach. No delay or omission by either of the parties hereto in exercising any right or power accruing upon the noncompliance or failure of performance by the other party hereto of any of the provisions of this Agreement shall impair any such right or power or be construed to be a waiver thereof. A waiver by either of the parties hereto of any of the covenants, conditions or agreements hereof to be performed by the other party hereto shall not be construed to be a waiver of any subsequent breach thereof or of any other covenant, condition or agreement herein contained.

23.11 Warranty: Contractor warrants that it has the ability to perform the agreed upon services; it shall provide suitable resources to perform work in accordance with this Agreement; it will provide the agreed upon services on a timely basis; it shall perform services in a manner consistent with the degree of care and skill ordinarily exercised by members of the same profession currently providing construction services under similar circumstances; and it is responsible for the construction of the Work of the Project in accordance with all designs, drawings, specifications, and other services furnished by Owner through the Project Architect for the Project.

23.12 Binding Effect: This Agreement, in its entirety, shall be binding upon all the parties hereto, their respective successors, heirs, executors, administrators or assigns.

23.13 Execution: Execution of this Agreement shall constitute approval and acceptance of all terms, covenants and conditions as modified and contained in the Contract Documents.

23.14 Sovereign Immunity: Contractor stipulates that Owner is a political subdivision of the State of Wyoming, and, as such, enjoys immunities from suit and liability provided by the Constitution and laws of the State of Wyoming. By entering into this Agreement, Owner does not waive any of its immunities

from suit and/or liability, except as otherwise specifically provided herein and as specifically authorized by law.

ARTICLE 24, CONCLUSION

This Agreement, including the Contract Documents incorporated herein, shall be binding upon and inure to the benefit of Owner and Contractor and their respective successors and assigns.

IN WITNESS WHEREOF, Owner and General Contractor have affixed their signatures effective on the date first written above.

The effective date of this Contract is the date of the signature last affixed to this page.

Contractor:

Enter Name & Title	<i>Signature</i>	<i>Date</i>
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Choose District:

Enter Name & Title	<i>Signature</i>	<i>Date</i>
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STATE OF WYOMING, STATE CONSTRUCTION DEPARTMENT, SCHOOL FACILITIES DIVISION:

Enter Name & Title	<i>Signature</i>	<i>Date</i>
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CONSTRUCTION NOTICE OF AWARD

Date of Notice: **Insert Date**
District: **Choose District**
Project Name: **Project Name**
SFD Project Number: **Project Number**

TO: **Company Name**
Address
City, State, ZIP

The **Choose District**, and Wyoming State Construction Department, School Facilities Division and represented by the undersigned, has considered the Proposals submitted for the above described work.

Your Proposal is deemed to be in the best interest of the District and the State of Wyoming. The following bid amounts and alternates are accepted, pending final execution of the Agreement.

- Base Bid in the amount of **Written Dollar Amount** DOLLARS AND NO/100* (**\$Numeric Dollar Amount** *) is hereby accepted.
- Bid Alternate number 1 for **Insert Description** in the amount of **Written Dollar Amount** DOLLARS AND NO/100* (**\$Numeric Dollar Amount** *) is hereby **Choose an item**
- Bid Alternate number 2 for **Insert Description** in the amount of **Written Dollar Amount** DOLLARS AND NO/100* (**\$Numeric Dollar Amount** *) is hereby **Choose an item**
- Bid Alternate number 3 for **Insert Description** in the amount of **Written Dollar Amount** DOLLARS AND NO/100* (**\$Numeric Dollar Amount** *) is hereby **Choose an item**
- Bid Alternate number 4 for **Insert Description** in the amount of **Written Dollar Amount** DOLLARS AND NO/100* (**\$Numeric Dollar Amount** *) is hereby **Choose an item**
- Bid Alternate number 5 for **Insert Description** in the amount of **Written Dollar Amount** DOLLARS AND NO/100* (**\$Numeric Dollar Amount** *) is hereby **Choose an item**
- Bid Alternate number 6 for **Insert Description** in the amount of **Written Dollar Amount** DOLLARS AND NO/100* (**\$Numeric Dollar Amount** *) is hereby **Choose an item**
- Total Contract Sum: The Total Contract Sum, including the Bid Contract Sum, accepted alternates and unit priced materials and labor is **Written Dollar Amount** DOLLARS AND NO/100* (**\$Numeric Dollar Amount**).

Please provide the following documents back to us within ten (10) calendar days from the date of this Notice:

1. Certificates of Insurance listing both the District and the SFD as additionally insured
2. Payment and Performance Bonds
3. Critical Path Method Schedule
4. Schedule of Values

Campbell County School District

Enter Name & Title *Signature*
Wyoming State Construction Department, School Facilities Division

Date _____

Enter Name & Title *Signature*

Date _____

CONSTRUCTION NOTICE TO PROCEED

Date of Notice: **Insert Date**

District: **Choose District**

Project Name: **Project Name**

SFD Project Number: **Project Number**

TO: **Company Name**
Address
City, State, ZIP

This is your **NOTICE TO PROCEED** with the **Campbell County School District, Phases 3 – 5**, SFD Project Number **Project Number**, given the Owner's acceptance of the proposal submitted by **Insert Contractor's Name** on **Enter Bid Date**.

Campbell County School District

Enter Name & Title *Signature* *Date*_____

Wyoming State Construction Department, School Facilities Division

Enter Name & Title *Signature* *Date*_____

CONTRACTOR'S AFFIDAVIT

**SWORN STATEMENT FOR PROGRESS PAYMENT NO. _____
PURSUANT TO WYOMING STATUTE § 16-6-1001**

RE: _____
PROJECT TITLE

**This statement is submitted by _____
(Contractor) to satisfy Wyoming Statute § 16-6-1001.**

I, _____, the authorized representative of the Contractor, hereby certify that all claims for materials and labor performed under the contract for the above-referenced project have been paid through Progress Payment No. _____, less any contracted amounts held for retainage.

If any claim for material and labor is disputed this sworn statement shall so state, and the amount claimed to be due shall be deducted from the progress payment due the Contractor and retained by the State of Wyoming until the determination of the dispute, either by judicial action or consent of the parties, and then paid by the agent or agency to persons found entitled thereto.

Claims for material and labor being disputed are stated as follows (list laborer name and amount due below):

Signature

Title

Date

STATE OF WYOMING)
)
COUNTY OF _____)

The foregoing instrument was subscribed and sworn to before me by
_____ who is the _____
of _____ this _____ day of
_____, 20_____.

Witness my hand and official seal.

Notary Public

My Commission Expires:

Revised August 2022

Contractors Affidavit

Page 1 of 1

Schedule of Values – Pay Application

[illegible]

Application and Certificate for Payment					County School District No.					Project Name					SCD Project No.: 0					Invoice Date: 0					Invoice No.: 0				
# Line Item	DIVISION Description	COMBINED						STATE						DISTRICT															
		Scheduled Value	Complete			Previous Periods	Complete	Balance to Finish	SHAR E	Scheduled Value	Complete			Previous Periods	Complete	Balance to Finish	SHAR E	Scheduled Value	Complete			Previous Periods	Complete	Balance to Finish					
			This Period								This Period								This Period										
67		\$ -	-	\$ -	-	\$ -	-	\$ -	-	\$ -	-	\$ -	-	\$ -	-	\$ -	-	\$ -	-	\$ -	-	\$ -	-	\$ -	-				
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91		\$ -	-	\$ -	-	\$ -	-																						



AIA® Document A310™ – 2010

Bid Bond

CONTRACTOR:

(Name, legal status and address)

SURETY:

(Name, legal status and principal place of business)

OWNER:

(Name, legal status and address)

BOND AMOUNT: \$**PROJECT:**

(Name, location or address, and Project number, if any)

The Contractor and Surety are bound to the Owner in the amount set forth above, for the payment of which the Contractor and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, as provided herein. The conditions of this Bond are such that if the Owner accepts the bid of the Contractor within the time specified in the bid documents, or within such time period as may be agreed to by the Owner and Contractor, and the Contractor either (1) enters into a contract with the Owner in accordance with the terms of such bid, and gives such bond or bonds as may be specified in the bidding or Contract Documents, with a surety admitted in the jurisdiction of the Project and otherwise acceptable to the Owner, for the faithful performance of such Contract and for the prompt payment of labor and material furnished in the prosecution thereof; or (2) pays to the Owner the difference, not to exceed the amount of this Bond, between the amount specified in said bid and such larger amount for which the Owner may in good faith contract with another party to perform the work covered by said bid, then this obligation shall be null and void, otherwise to remain in full force and effect. The Surety hereby waives any notice of an agreement between the Owner and Contractor to extend the time in which the Owner may accept the bid. Waiver of notice by the Surety shall not apply to any extension exceeding sixty (60) days in the aggregate beyond the time for acceptance of bids specified in the bid documents, and the Owner and Contractor shall obtain the Surety's consent for an extension beyond sixty (60) days.

If this Bond is issued in connection with a subcontractor's bid to a Contractor, the term Contractor in this Bond shall be deemed to be Subcontractor and the term Owner shall be deemed to be Contractor.

When this Bond has been furnished to comply with a statutory or other legal requirement in the location of the Project, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. When so furnished, the intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

ADDITIONS AND DELETIONS:

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

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

Any singular reference to Contractor, Surety, Owner or other party shall be considered plural where applicable.

Signed and sealed this day of ,

(Witness)

(Witness)

(Contractor as Principal)

(Seal)

(Title)

(Surety)

(Seal)

(Title)

Init.

/



AIA[®] Document A312[™] – 1984

Performance Bond

CONTRACTOR (Name and Address):

SURETY (Name and Principal Place of Business):

OWNER (Name and Address):

CONSTRUCTION CONTRACT

Date:

Amount:

Description (Name and Location):

BOND

Date (Not earlier than Construction Contract Date):

Amount:

Modifications to this Bond: ☐ None ☐ See Last Page

CONTRACTOR AS PRINCIPAL

Company: (Corporate Seal)

Signature: _____

Name and

Title:

(Any additional signatures appear on the last page)

SURETY

Company: (Corporate Seal)

Signature: _____

Name and

Title:

(FOR INFORMATION ONLY - Name, Address and Telephone)

AGENT or **BROKER**:

OWNER'S REPRESENTATIVE

(Architect, Engineer or other party):

ADDITIONS AND DELETIONS:

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

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

Any singular reference to Contract, Surety, Owner or other party shall be considered plural where applicable.

§ 1 The Contractor and the Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to the Owner for the performance of the Construction Contract, which is incorporated herein by reference.

§ 2 If the Contractor performs the Construction Contract, the Surety and the Contractor shall have no obligation under this Bond, except to participate in conferences as provided in Section 3.1.

§ 3 If there is no Owner Default, the Surety's obligation under this Bond shall arise after:

§ 3.1 The Owner has notified the Contractor and the Surety at its address described in Section 10 below that the Owner is considering declaring a Contractor Default and has requested and attempted to arrange a conference with the Contractor and the Surety to be held not later than fifteen days after receipt of such notice to discuss methods of performing the Construction Contract. If the Owner, the Contractor and the Surety agree, the Contractor shall be allowed a reasonable time to perform the Construction Contract, but such an agreement shall not waive the Owner's right, if any, subsequently to declare a Contractor Default; and

§ 3.2 The Owner has declared a Contractor Default and formally terminated the Contractor's right to complete the contract. Such Contractor Default shall not be declared earlier than twenty days after the Contractor and the Surety have received notice as provided in Section 3.1; and

§ 3.3 The Owner has agreed to pay the Balance of the Contract Price to the Surety in accordance with the terms of the Construction Contract or to a contractor selected to perform the Construction Contract in accordance with the terms of the contract with the Owner.

§ 4 When the Owner has satisfied the conditions of Section 3, the Surety shall promptly and at the Surety's expense take one of the following actions:

§ 4.1 Arrange for the Contractor, with consent of the Owner, to perform and complete the Construction Contract; or

§ 4.2 Undertake to perform and complete the Construction Contract itself, through its agents or through independent contractors; or

§ 4.3 Obtain bids or negotiated proposals from qualified contractors acceptable to the Owner for a contract for performance and completion of the Construction Contract, arrange for a contract to be prepared for execution by the Owner and the contractor selected with the Owner's concurrence, to be secured with performance and payment bonds executed by a qualified surety equivalent to the bonds issued on the Construction Contract, and pay to the Owner the amount of damages as described in Section 6 in excess of the Balance of the Contract Price incurred by the Owner resulting from the Contractor's default; or

§ 4.4 Waive its right to perform and complete, arrange for completion, or obtain a new contractor and with reasonable promptness under the circumstances:

- .1** After investigation, determine the amount for which it may be liable to the Owner and, as soon as practicable after the amount is determined, tender payment therefor to the Owner; or
- .2** Deny liability in whole or in part and notify the Owner citing reasons therefor.

§ 5 If the Surety does not proceed as provided in Section 4 with reasonable promptness, the Surety shall be deemed to be in default on this Bond fifteen days after receipt of an additional written notice from the Owner to the Surety demanding that the Surety perform its obligations under this Bond, and the Owner shall be entitled to enforce any remedy available to the Owner. If the Surety proceeds as provided in Section 4.4, and the Owner refuses the payment tendered or the Surety has denied liability, in whole or in part, without further notice the Owner shall be entitled to enforce any remedy available to the Owner.

§ 6 After the Owner has terminated the Contractor's right to complete the Construction Contract, and if the Surety elects to act under Section 4.1, 4.2, or 4.3 above, then the responsibilities of the Surety to the Owner shall not be greater than those of the Contractor under the Construction Contract, and the responsibilities of the Owner to the Surety shall not be greater than those of the Owner under the Construction Contract. To the limit of the amount of this Bond, but subject to commitment by the Owner of the Balance of the Contract Price to mitigation of costs and damages on the Construction Contract, the Surety is obligated without duplication for:

§ 6.1 The responsibilities of the Contractor for correction of defective work and completion of the Construction Contract;

§ 6.2 Additional legal, design professional and delay costs resulting from the Contractor's Default, and resulting from the actions or failure to act of the Surety under Section 4; and

§ 6.3 Liquidated damages, or if no liquidated damages are specified in the Construction Contract, actual damages caused by delayed performance or non-performance of the Contractor.

§ 7 The Surety shall not be liable to the Owner or others for obligations of the Contractor that are unrelated to the Construction Contract, and the Balance of the Contract Price shall not be reduced or set off on account of any such unrelated obligations. No right of action shall accrue on this Bond to any person or entity other than the Owner or its heirs, executors, administrators or successors.

§ 8 The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders and other obligations.

§ 9 Any proceeding, legal or equitable, under this Bond may be instituted in any court of competent jurisdiction in the location in which the work or part of the work is located and shall be instituted within two years after Contractor Default or within two years after the Contractor ceased working or within two years after the Surety refuses or fails to perform its obligations under this Bond, whichever occurs first. If the provisions of this Paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.

§ 10 Notice to the Surety, the Owner or the Contractor shall be mailed or delivered to the address shown on the signature page.

§ 11 When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted here from and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. The intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

§ 12 DEFINITIONS

§ 12.1 Balance of the Contract Price: The total amount payable by the Owner to the Contractor under the Construction Contract after all proper adjustments have been made, including allowance to the Contractor of any amounts received or to be received by the Owner in settlement of insurance or other claims for damages to which the Contractor is entitled, reduced by all valid and proper payments made to or on behalf of the Contractor under the Construction Contract.

§ 12.2 Construction Contract: The agreement between the Owner and the Contractor identified on the signature page, including all Contract Documents and changes thereto.

§ 12.3 Contractor Default: Failure of the Contractor, which has neither been remedied nor waived, to perform or otherwise to comply with the terms of the Construction Contract.

§ 12.4 Owner Default: Failure of the Owner, which has neither been remedied nor waived, to pay the Contractor as required by the Construction Contract or to perform and complete or comply with the other terms thereof.

§ 13 MODIFICATIONS TO THIS BOND ARE AS FOLLOWS:

(Space is provided below for additional signatures of added parties, other than those appearing on the cover page.)

CONTRACTOR AS PRINCIPAL

Company: _____
(Corporate Seal)

Signature: _____
Name and Title: _____
Address: _____

SURETY

Company: _____
(Corporate Seal)

Signature: _____
Name and Title: _____
Address: _____

Payment Bond

CONTRACTOR *(Name and Address):*

SURETY *(Name and Principal Place of Business):*

OWNER *(Name and Address):*

CONSTRUCTION CONTRACT

Date:

Amount:

Description *(Name and Location):*

BOND

Date *(Not earlier than Construction Contract Date):*

Amount:

Modifications to this Bond: ☒ None ☐ See Last Page

CONTRACTOR AS PRINCIPAL

Company: *(Corporate Seal)*

SURETY

Company: *(Corporate Seal)*

Signature: _____

Name and Title:

(Any additional signatures appear on the last page)

Signature: _____

Name and Title:

(FOR INFORMATION ONLY - Name, Address and Telephone)

AGENT or BROKER:

OWNER'S REPRESENTATIVE *(Architect, Engineer or other party):*

§ 1 The Contractor and the Surety, jointly and severally bind themselves, their heirs, executors, administrators, successors and assigns to the Owner to pay for labor, materials and equipment furnished for use in the performance of the Construction Contract, which is incorporated herein by reference.

§ 2 With respect to the Owner, this obligation shall be null and void if the Contractor:

§ 2.1 Promptly makes payment, directly or indirectly, for all sums due Claimants, and

§ 2.2 Defends, indemnifies and holds harmless the Owner from claims, demands, liens or suits by any person or entity whose claim, demand, lien or suit is for the payment for labor, materials or equipment furnished for use in the performance of the Construction Contract, provided the Owner has promptly notified the Contractor and the Surety (at the address described in Section 12) of any claims, demands, liens or suits and tendered defense of such claims, demands, liens or suits to the Contractor and the Surety, and provided there is no Owner Default.

§ 3 With respect to Claimants, this obligation shall be null and void if the Contractor promptly makes payment, directly or indirectly, for all sums due.

§ 4 The Surety shall have no obligation to Claimants under this Bond until:

§ 4.1 Claimants who are employed by or have a direct contract with the Contractor have given notice to the Surety (at the address described in Section 12) and sent a copy, or notice thereof, to the Owner, stating that a claim is being made under this Bond and, with substantial accuracy, the amount of the claim.

§ 4.2 Claimants who do not have a direct contract with the Contractor:

- .1 Have furnished written notice to the Contractor and sent a copy, or notice thereof, to the Owner, within 90 days after having last performed labor or last furnished materials or equipment included in the claim stating, with substantial accuracy, the amount of the claim and the name of the party to whom the materials were furnished or supplied or for whom the labor was done or performed; and
- .2 Have either received a rejection in whole or in part from the Contractor, or not received within 30 days of furnishing the above notice any communication from the Contractor by which the Contractor has indicated the claim will be paid directly or indirectly; and
- .3 Not having been paid within the above 30 days, have sent a written notice to the Surety (at the address described in Section 12) and sent a copy, or notice thereof, to the Owner, stating that a claim is being made under this Bond and enclosing a copy of the previous written notice furnished to the Contractor.

§ 5 If a notice required by Section 4 is given by the Owner to the Contractor or to the Surety, that is sufficient compliance.

§ 6 When the Claimant has satisfied the conditions of Section 4, the Surety shall promptly and at the Surety's expense take the following actions:

§ 6.1 Send an answer to the Claimant, with a copy to the Owner, within 45 days after receipt of the claim, stating the amounts that are undisputed and the basis for challenging any amounts that are disputed.

§ 6.2 Pay or arrange for payment of any undisputed amounts.

§ 7 The Surety's total obligation shall not exceed the amount of this Bond, and the amount of this Bond shall be credited for any payments made in good faith by the Surety.

§ 8 Amounts owed by the Owner to the Contractor under the Construction Contract shall be used for the performance of the Construction Contract and to satisfy claims, if any, under any Construction Performance Bond. By the Contractor furnishing and the Owner accepting this Bond, they agree that all funds earned by the Contractor in the performance of the Construction Contract are dedicated to satisfy obligations of the Contractor and the Surety under this Bond, subject to the Owner's priority to use the funds for the completion of the work.

§ 9 The Surety shall not be liable to the Owner, Claimants or others for obligations of the Contractor that are unrelated to the Construction Contract. The Owner shall not be liable for payment of any costs or expenses of any Claimant under this Bond, and shall have under this Bond no obligations to make payments to, give notices on behalf of, or otherwise have obligations to Claimants under this Bond.

§ 10 The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders and other obligations.

§ 11 No suit or action shall be commenced by a Claimant under this Bond other than in a court of competent jurisdiction in the location in which the work or part of the work is located or after the expiration of one year from the date (1) on which the Claimant gave the notice required by Section 4.1 or Section 4.2.3, or (2) on which the last labor or service was performed by anyone or the last materials or equipment were furnished by anyone under the Construction Contract, whichever of (1) or (2) first occurs. If the provisions of this Paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.

§ 12 Notice to the Surety, the Owner or the Contractor shall be mailed or delivered to the address shown on the signature page. Actual receipt of notice by Surety, the Owner or the Contractor, however accomplished, shall be sufficient compliance as of the date received at the address shown on the signature page.

§ 13 When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. The intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

§ 14 Upon request by any person or entity appearing to be a potential beneficiary of this Bond, the Contractor shall promptly furnish a copy of this Bond or shall permit a copy to be made.

§ 15 DEFINITIONS

§ 15.1 Claimant: An individual or entity having a direct contract with the Contractor or with a subcontractor of the Contractor to furnish labor, materials or equipment for use in the performance of the Contract. The intent of this Bond shall be to include without limitation in the terms "labor, materials or equipment" that part of water, gas, power, light, heat, oil, gasoline, telephone service or rental equipment used in the Construction Contract, architectural and engineering services required for performance of the work of the Contractor and the Contractor's subcontractors, and all other items for which a mechanic's lien may be asserted in the jurisdiction where the labor, materials or equipment were furnished.

§ 15.2 Construction Contract: The agreement between the Owner and the Contractor identified on the signature page, including all Contract Documents and changes thereto.

§ 15.3 Owner Default: Failure of the Owner, which has neither been remedied nor waived, to pay the Contractor as required by the Construction Contract or to perform and complete or comply with the other terms thereof.

§ 16 MODIFICATIONS TO THIS BOND ARE AS FOLLOWS:

(Space is provided below for additional signatures of added parties, other than those appearing on the cover page.)

CONTRACTOR AS PRINCIPAL

Company: _____ (Corporate Seal)

Signature: _____
Name and Title: _____
Address: _____

SURETY

Company: _____ (Corporate Seal)

Signature: _____
Name and Title: _____
Address: _____



AIA[®] Document G704[™] – 2000

Certificate of Substantial Completion

PROJECT:
(Name and address)

PROJECT NUMBER: /
CONTRACT FOR: General Construction
CONTRACT DATE:

OWNER: ☐

ARCHITECT: ☐

CONTRACTOR: ☐

FIELD: ☐

OTHER: ☐

TO OWNER:
(Name and address)

TO CONTRACTOR:
(Name and address)

PROJECT OR PORTION OF THE PROJECT DESIGNATED FOR PARTIAL OCCUPANCY OR USE SHALL INCLUDE:

The Work performed under this Contract has been reviewed and found, to the Architect's best knowledge, information and belief, to be substantially complete. Substantial Completion is the stage in the progress of the Work when the Work or designated portion is sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work for its intended use. The date of Substantial Completion of the Project or portion designated above is the date of issuance established by this Certificate, which is also the date of commencement of applicable warranties required by the Contract Documents, except as stated below:

Warranty

Date of Commencement

ARCHITECT

BY

DATE OF ISSUANCE

A list of items to be completed or corrected is attached hereto. The failure to include any items on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents. Unless otherwise agreed to in writing, the date of commencement of warranties for items on the attached list will be the date of issuance of the final Certificate of Payment or the date of final payment.

Cost estimate of Work that is incomplete or defective: \$0.00

The Contractor will complete or correct the Work on the list of items attached hereto within Zero (0) days from the above date of Substantial Completion.

CONTRACTOR

BY

DATE

The Owner accepts the Work or designated portion as substantially complete and will assume full possession at _____ (time) on _____ (date).

OWNER

BY

DATE

The responsibilities of the Owner and Contractor for security, maintenance, heat, utilities, damage to the Work and insurance shall be as follows:

(Note: Owner's and Contractor's legal and insurance counsel should determine and review insurance requirements and coverage.)



AIA[®] Document G706[™] – 1994

Contractor's Affidavit of Payment of Debts and Claims

PROJECT: <i>(Name and address)</i>	ARCHITECT'S PROJECT NUMBER:	OWNER: ☐
		ARCHITECT: ☐
TO OWNER: <i>(Name and address)</i>	CONTRACT FOR: General Construction	CONTRACTOR: ☐
	CONTRACT DATED:	SURETY: ☐
		OTHER: ☐

STATE OF:
COUNTY OF:

The undersigned hereby certifies that, except as listed below, payment has been made in full and all obligations have otherwise been satisfied for all materials and equipment furnished, for all work, labor, and services performed, and for all known indebtedness and claims against the Contractor for damages arising in any manner in connection with the performance of the Contract referenced above for which the Owner or Owner's property might in any way be held responsible or encumbered.

EXCEPTIONS:

SUPPORTING DOCUMENTS ATTACHED HERETO:

1. Consent of Surety to Final Payment. Whenever Surety is involved, Consent of Surety is required. AIA Document G707, Consent of Surety, may be used for this purpose
Indicate Attachment ☐ Yes ☐ No

The following supporting documents should be attached hereto if required by the Owner:

1. Contractor's Release or Waiver of Liens, conditional upon receipt of final payment.
2. Separate Releases or Waivers of Liens from Subcontractors and material and equipment suppliers, to the extent required by the Owner, accompanied by a list thereof.
3. Contractor's Affidavit of Release of Liens (AIA Document G706A).

CONTRACTOR: *(Name and address)*

BY: _____
(Signature of authorized representative)

(Printed name and title)

Subscribed and sworn to before me on this date:

Notary Public:
My Commission Expires:



AIA[®] Document G706A[™] – 1994

Contractor's Affidavit of Release of Liens

PROJECT: <i>(Name and address)</i>	ARCHITECT'S PROJECT NUMBER:	OWNER: ☐
	CONTRACT FOR: General Construction	ARCHITECT: ☐
TO OWNER: <i>(Name and address)</i>	CONTRACT DATED:	CONTRACTOR: ☐
		SURETY: ☐
		OTHER: ☐

STATE OF:
COUNTY OF:

The undersigned hereby certifies that to the best of the undersigned's knowledge, information and belief, except as listed below, the Releases or Waivers of Lien attached hereto include the Contractor, all Subcontractors, all suppliers of materials and equipment, and all performers of Work, labor or services who have or may have liens or encumbrances or the right to assert liens or encumbrances against any property of the Owner arising in any manner out of the performance of the Contract referenced above.

EXCEPTIONS:

SUPPORTING DOCUMENTS ATTACHED HERETO:

1. Contractor's Release or Waiver of Liens, conditional upon receipt of final payment.
2. Separate Releases or Waivers of Liens from Subcontractors and material and equipment suppliers, to the extent required by the Owner, accompanied by a list thereof.

CONTRACTOR: *(Name and address)*

BY:

(Signature of authorized representative)

(Printed name and title)

Subscribed and sworn to before me on this date:

Notary Public:

My Commission Expires:



AIA® Document G707™ – 1994

Consent Of Surety to Final Payment

PROJECT: *(Name and address)*

ARCHITECT'S PROJECT NUMBER:

OWNER: ☐

CONTRACT FOR: General Construction

ARCHITECT: ☐

TO OWNER: *(Name and address)*

CONTRACT DATED:

CONTRACTOR: ☐

SURETY: ☐

OTHER: ☐

In accordance with the provisions of the Contract between the Owner and the Contractor as indicated above, the
(Insert name and address of Surety)

on bond of
(Insert name and address of Contractor)

, SURETY,

hereby approves of the final payment to the Contractor, and agrees that final payment to the Contractor shall not relieve the
Surety of any of its obligations to
(Insert name and address of Owner)

, CONTRACTOR,

as set forth in said Surety's bond.

, OWNER,

IN WITNESS WHEREOF, the Surety has hereunto set its hand on this date:
(Insert in writing the month followed by the numeric date and year.)

(Surety)

(Signature of authorized representative)

(Printed name and title)

Attest:
(Seal):

SECTION 011000 - SUMMARY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this section.

1.2 WORK COVERED BY CONTRACT DOCUMENTS

- A. Project Identification: Campbell County School District #1
Phase 3 – New High School
Gillette, WY
- B. Project Location: 1000 Camel Drive
Gillette, WY 82716
- C. Project Summary: The Campbell County School District is redeveloping its High School Campus through a phased program including new athletic and educational facilities.
 - 1. Phase 1: Site Demolition (Complete)
 - 2. Phase 2: New Athletic Stadium and Amenities (Under Construction, Separate Contract)
 - 3. Phase 3 includes the demolition of the existing athletic fields and facilities following the 2026 Fall sports season, utility relocations and modifications, earthwork and site development, aggregate piers, superstructure typical of public education facilities including concrete, steel, masonry and metal framing. Interior fit out of facilities including educational spaces, administrative offices, cafeteria and athletics. The total SFD appropriated scope area is equal to 191,662 Square Feet and has a capacity for 1200 Students. CCSD intends to also include enhancements to the project including a primary Gym, an Auxiliary Gym, Weight Room and Cooling capacity for the primary Gym. The total square footage for these enhancements is 20,500, bringing the building total to approximately 212,000 square feet
 - 4. Phase 4 includes demolition of the existing approximately 300,000 sf high school after students and staff have relocated to the new high school.
 - 5. Phase 5 consists of site development, new parking lot and drives, landscaping and site amenities in the footprint of the former school to support the new campus functions
- D. Project Team:
 - 1. **ARCHITECT OF RECORD**
PLAN ONE ARCHITECTS
225 W. YELLOWSTONE AVE. SUITE 4
CODY | WY 82414
TAYLOR LEE, AIA
307.587.8646
tlee@planone.com

2. **DESIGN / ASSOCIATE ARCHITECT**
DLR GROUP
1401 LAWRENCE ST. | SUITE 1000
DENVER | CO 80202
MAYRAJ PEER, AIA
303.990.4873
mpeer@dlrgroup.com
3. **CIVIL**
KL&A
150 SOUTH MAIN STREET
BUFFALO | WY 82834
CRAIG SHAVLIK, PE
307.621.7011
cshavlik@klaa.com
4. **LANDSCAPE**
BHA DESIGN
111 S. MELDRUM ST, SUITE 110
FORT COLLINS | CO 80209
JEFF KROEGER
970.223.7577
jkroeger@bhadesign.com
5. **STRUCTURAL**
MARTIN & MARTIN CONSULTING ENG.
6523 YELLOWSTONE ROAD, SUITE 200
CHEYENNE | WY 82009
AMANDA MILLER, PE, SE
307.283.3900
amiller@mmwyo.com
6. **MECHANICAL + PLUMBING**
ACE INC.
19 S. MAIN STREET
SHERIDAN | WY 82801
ROBERT DETIMORE, PE
robertd@acemt.com
307.673.5300
7. **ELECTRICAL**
ACE INC.
3860 O'LEARY STREET, SUITE B
MISSOULA | MT 59808
DARIN VAN OOSTERHOUT
darinv@acemt.com
406.549.4160
8. **TECHNOLOGY**
RTM ENGINEERING CONSULTANTS
251 LINDEN STREET, SUITE 200
FORT COLLINS | CO 80524
ERIC RUBOTTOM, PE
303.986.8200
eric.rubottom@rtmec.com

9. **FOODSERVICE**
YOUNG CARUSO
8055 EAST TUFTS AVE., SUITE 1320
DENVER | CO 80237
STEPHEN YOUNG, FCSI
303.986.8200
syoung@youngcaruso.com
10. **THEATRICAL**
DLAA
1536 OGDEN STREET,
DENVER | CO 80218
STEPHANIE ADAMS-BALL
303.455.1900
sadams@dlaa.com
11. **GEOTECHNICAL**
INBERG-MILLER ENGINEERS
1300 E US HIGHWAY 14-16
GILLETTE I WY 82716
KEVIN STANEK, PE
307.682.5000
kstanek@inberg-miller.com

- F. General: Cooperate fully with separate contractors so work on those contracts may be carried out smoothly, without interfering with or delaying work under this Contract. Coordinate the work of this Contract with work performed under separate contracts.

1.3 OWNER-FURNISHED PRODUCTS

- A. Owner will furnish products indicated. The Work includes providing support systems to receive Owners equipment and making plumbing, mechanical and electrical connections.
1. Owner will arrange for and deliver shop drawings, product data and samples to Contractor.
 2. Owner will arrange and pay for delivery of Owner-furnished items according to Contractors Construction Schedule.
 3. Contractor is responsible for receiving, unloading and handling Owner-furnished items at Project site (if they are to be contractor installed).
 4. After delivery, Owner may inspect delivered items for damage. Contractor shall be present for and assist in Owners inspection.
 5. If Owner-furnished items are damaged, defective or missing, Owner will arrange for replacement.
 6. Owner will arrange for manufacturers field services.
 7. Owner will furnish Contractor the earliest possible delivery date for Owner-furnished products. Using Owner-furnished earliest possible delivery dates, Contractor shall designate delivery dates of Owner-furnished items in Contractors Construction Schedule.
 8. Contractor shall review shop drawings, product data and samples and return them to Architect noting discrepancies or anticipated problems in use of product.

9. Contractor is responsible for protecting Owner-furnished items from damage during storage and handling, including damage from exposure to the elements.
10. If Owner-furnished items are damaged as a result of Contractors operations, Contractor shall repair or replace them.
11. Contractor shall install and otherwise incorporate Owner-furnished items into the work.

B. Owner-Furnished Products (OSCI): Owner-Furnished Products include new and existing items owned by the Campbell County School District and located at either the construction site or other sites that are to be carefully removed from their present location, transported to the new site and installed in the new location by the Contractor. The installation of these OSCI items is a part of this Contract. These OSCI items include:

1. Items noted on the drawings.

C. Not In Contract Items (NIC); the following items will be provided and installed by the Owner. These items are not a part of any bid package and are listed here for reference only:

1. Items noted on the drawings.

1.4 USE OF PREMISES

General: Contractor shall have full use of premises for construction operations, including use of Project site, during construction period. Contractors' use of premises is limited by Owners right to perform work or to retain other contractors on portions of Project.

1.5 OWNER'S OCCUPANCY REQUIREMENTS

- A. Owner Occupancy of Completed Areas of Construction: Owner reserves the right to occupy and to place and install equipment in completed areas of building, before Substantial Completion, provided such occupancy does not interfere with completion of the work. Such placement of equipment and partial occupancy shall not constitute acceptance of the total work.
- B. The procedures for establishing partial occupancy shall follow those described in Section 9.9 of the General Conditions of the Contract.

1.6 SPECIFICATION FORMATS AND CONVENTIONS

- A. Specification Format: The specifications are organized into divisions and sections using the 36-division format and CSI/CSC's "Master Format" numbering system.
 1. Section Identification: The specifications use section numbers and titles to help cross-referencing in the Contract Documents. Sections in the Project Manual are in numeric sequence; however, the sequence is incomplete because all available section numbers are not used. Consult the table of contents at the beginning of

- the Project Manual to determine numbers and names of sections in the Contract Documents.
2. Division 1: Sections in Division 1 govern the execution of the work of all sections in the specifications.
- B. Specification Content: The specifications use certain conventions for the style of language and the intended meaning of certain terms, words and phrases when used in particular situations. These conventions are as follows:
1. Abbreviated Language: Language used in the specifications and other Contract Documents is abbreviated. Words and meanings shall be interpreted as appropriate. Words implied, but not stated, shall be inferred, as the sense requires. Singular words shall be interpreted as plural and plural words shall be interpreted as singular where applicable as the context of the Contract Documents indicates.
 2. Imperative mood and streamlined language are generally used in the specifications. Requirements expressed in the imperative mood are to be performed by Contractor. Occasionally, the indicative or subjunctive mood may be used in the section text for clarity to describe responsibilities that must be fulfilled indirectly by Contractor or by others when so noted.
 - a. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.
- C. Drawing Coordination: Requirements for materials and products identified on drawings are described in detail in the specifications. One or more of the following are used on drawings to identify materials and products:
1. Terminology: Materials and products are identified by the typical generic terms used in the individual specification's sections.
 2. Abbreviations: Materials and products are identified by abbreviations published as part of the U.S. National CAD Standard and scheduled on drawings.
- B. Drawing Format: The drawings amongst themselves are considered additive and comprehensive. If a scope item occurs on one drawing, it may not occur on every drawing, but it is still part of the entire project and is included in the scope of work.
- C. Drawing and Specification Format: The drawings and specifications in relation to each other are considered additive and comprehensive. If a scope item occurs on the drawings, it may not occur in the specifications (and vice versa), but it is still part of the entire project and is included in the scope of work.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 011000

SECTION 012300 - ALTERNATES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for alternates.

1.3 DEFINITIONS

- A. Alternate: An amount proposed by bidders and stated on the Bid Form for certain work defined in the bidding requirements that may be added to or deducted from the base bid amount if the Owner decides to accept a corresponding change either in the amount of construction to be completed or in the products, materials, equipment, systems or installation methods described in the Contract Documents.
 - 1. Alternates described in this section are part of the work only if enumerated in the Agreement.
 - 2. The cost or credit for each alternate is the net addition to or deduction from the Contract Sum to incorporate alternates into the work. No other adjustments are made to the Contract Sum.

1.4 PROCEDURES

- A. Coordination: Revise or adjust affected adjacent work as necessary to completely integrate work of the alternate into Project.
 - 1. Include as part of each alternate, miscellaneous devices, accessory objects and similar items incidental to or required for a complete installation whether or not indicated as part of alternate.
- B. Execute accepted alternates under the same conditions as other work of the Contract.
- C. Schedule: A schedule of alternates is included at the end of this section. Specification sections referenced in schedule contain requirements for materials necessary to achieve the work described under each alternate.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 SCHEDULE OF ALTERNATES:

A. Additive Bid Alternate #1 – Gym Cooling

1. Additive Bid Alternate 1: This alternate includes adding cooling to the gyms – See mechanical for additional information.
2. Base bid to include: No cooling for the gym areas – See Mechanical for additional information.

B. Additive Bid Alternate #2 – Weight Room

1. Additive Bid Alternate 2: This alternate includes additional square footage for the following rooms: Weight Room
2. Base bid to include: No Weight Room

C. Additive Bid Alternate #3 – Sensory Lighting

1. Additive Bid Alternate #3: This alternate is to add sensory lighting around the perimeter of the room and the associated controls in Sensory B110
2. Base bid to include: No sensory lighting in Sensory B110.

D. Additive Bid Alternate #4 – Screen Wall

1. Additive Bid Alternate 4: This alternate includes adding a screen wall between the G-Building and the Northwest Learning Suite, as identified in Architectural drawings.
2. Base bid to include: No screen wall

E. Additive Bid Alternate #5 – West Lawn Outdoor Seating Areas

1. Additive Bid Alternate 5: This alternate includes adding three informal seating areas west of the school including boulders, crusher fines paving and landscaping as identified in Landscape and Irrigation Plans
2. Base bid to include: Irrigated turf lawn, no informal seating areas

F. Additive Bid Alternate #6 – Discus and Multi-Purpose Field Practice Area

1. Additive Bid Alternate 6: This alternate includes adding three practice discus throwing rings, irrigated turf, and approximately 360 lf of chain link fence west of the

existing soccer fields for multi-purpose practice use as identified in Landscape and Irrigation Plans.

2. Base bid to include: Native seed, no discuss, fence sod or irrigation.

END OF SECTION 012300

SECTION 012500 - SUBSTITUTION PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for substitutions.
Related Requirements:
 - 1. Section 016000 "Product Requirements" for requirements for submitting comparable product submittals for products by listed manufacturers.

1.3 DEFINITIONS

- A. Substitutions: Changes in products, materials, equipment and methods of construction from those required by the contract documents and proposed by Contractor.
 - 1. Substitutions for Cause: Changes proposed by Contractor that are required due to changed Project conditions, such as unavailability of product, regulatory changes, or unavailability of required warranty terms.
 - 2. Substitutions for Convenience: Changes proposed by Contractor or Owner that are not required in order to meet other Project requirements but may offer advantage to Contractor or Owner.

1.4 ACTION SUBMITTALS

- A. Substitution Requests: Submit three copies of each request for consideration. Identify product or fabrication or installation method to be replaced. Include specification section number and title and drawing numbers and titles.
 - 1. Substitution Request Form: Use facsimile of form provided in Project Manual.
 - 2. Documentation: Show compliance with requirements for substitutions and the following, as applicable:
 - a. Statement indicating why specified product or fabrication or installation method cannot be provided, if applicable.
 - b. Coordination of information, including a list of changes or revisions needed to other parts of the work and to construction performed by Owner and

separate Contractors that will be necessary to accommodate proposed substitution.

- c. Detailed comparison of significant qualities of proposed substitutions with those of the work specified. Include annotated copy of applicable specification section. Significant qualities may include attributes, such as performance, weight, size, durability, visual effect, sustainable design characteristics, warranties and specific features and requirements indicated. Indicate deviations, if any, from the work specified.
 - d. Product data, including drawings and descriptions of products and fabrication and installation procedures.
 - e. Samples, where applicable or requested.
 - f. Certificates and qualification data, where applicable or requested.
 - g. List of similar installations for completed projects, with project names and addresses as well as names and addresses of Architects and Owners.
 - h. Material test reports from a qualified testing agency, indicating and interpreting test results for compliance with requirements indicated.
 - i. Detailed comparison of Contractors construction schedule using proposed substitutions with products specified for the work, including effect on the overall contract time. If specified product or method of construction cannot be provided within the contract time, include letter from manufacturer, on manufacturers letterhead, stating date of receipt of purchase order, lack of availability or delays in delivery.
 - j. Cost information, including a proposal of change, if any, in the contract sum.
 - k. Contractors certification that proposed substitution complies with requirements in the contract documents, except as indicated in substitution request, is compatible with related materials and is appropriate for applications indicated.
 - l. Contractors waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.
3. Architects Action: If necessary, Architect will request additional information or documentation for evaluation within seven-days of receipt of a request for substitution. Architect will notify Contractor of acceptance or rejection of proposed substitution within fifteen-days of receipt of request or seven-days of receipt of additional information or documentation, whichever is later.
- a. Forms of Acceptance: Change Order, Construction Change Directive or Architects Supplemental Instructions for minor changes in the work.
 - b. Use product specified if Architect does not issue a decision on use of a proposed substitution within time allocated.

1.5 QUALITY ASSURANCE

- A. Compatibility of Substitutions: Investigate and document compatibility of proposed substitution with related products and materials. Engage a qualified testing agency to perform compatibility tests recommended by manufacturers.

1.6 PROCEDURES

- A. Coordination: Revise or adjust affected work as necessary to integrate work of the approved substitutions.

1.7 SUBSTITUTIONS

- A. Substitutions for Cause: Submit requests for substitution immediately on discovery of need for change but not later than 10-calendar days prior to the bid date.
 - 1. Conditions: Architect will consider Contractors request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record non-compliance with these requirements:
 - a. Requested substitution is consistent with the contract documents and will produce indicated results.
 - b. Substitution request is fully documented and properly submitted.
 - c. Requested substitution will not adversely affect Contractors construction schedule.
 - d. Requested substitution has received necessary approvals of authorities having jurisdiction.
 - e. Requested substitution is compatible with other portions of the work.
 - f. Requested substitution has been coordinated with other portions of the work.
 - g. Requested substitution provides specified warranty.
 - h. If requested substitution involves more than one Contractor, requested substitution has been coordinated with other portions of the work, is uniform and consistent, is compatible with other products and is acceptable to all Contractors involved.
- B. Substitutions for Convenience: Not allowed.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 012500

SECTION 012600 - CONTRACT MODIFICATION PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for handling and processing Contract modifications.
- B. Related Requirements:
 - 1. Section 012500 "Substitution Procedures" for administrative procedures for handling requests for substitutions made after the Contract award.

1.3 MINOR CHANGES IN THE WORK

- A. Architect will issue supplemental instructions authorizing minor changes in the work, not involving adjustment to the Contract Sum or the Contract Time on AIA Document G710.

1.4 PROPOSAL REQUESTS

- A. Owner Initiated Proposal Requests: Architect will issue a detailed description of proposed changes in the work that may require adjustment to the Contract Sum or the Contract Time. If necessary, the description will include supplemental or revised drawings and specifications.
 - 1. Work Change Proposal Requests issued by Architect are not instructions either to stop work in progress or to execute the proposed change.
 - 2. Within 10-days after receipt of Proposal Request, submit a quotation estimating cost adjustments to the Contract Sum and the Contract Time necessary to execute the change.
 - a. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
 - b. Indicate applicable taxes, delivery charges, equipment rental and amounts of trade discounts.
 - c. Include costs of labor and supervision directly attributable to the change.

- d. Include an updated Contractors construction schedule that indicates the effect of the change, including but not limited to changes in activity duration, start and finish times and activity relationship. Use available total float before requesting an extension of the Contract Time.
- B. Contractor Initiated Proposals: If latent or changed conditions require modifications to the Contract, Contractor may initiate a claim by submitting a request for a change to Architect.
 - 1. Include a statement outlining reasons for the change and the effect of the change on the work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and the Contract Time.
 - 2. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
 - 3. Indicate applicable taxes, delivery charges, equipment rental and amounts of trade discounts.
 - 4. Include costs of labor and supervision directly attributable to the change.
 - 5. Include an updated Contractors construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times and activity relationship. Use available total float before requesting an extension of the Contract Time.
 - 6. Comply with requirements in Section 01 25 00 "Substitution Procedures" if the proposed change requires substitution of one product or system for product or system specified.

1.5 CHANGE ORDER PROCEDURES

- A. On Owners approval of a Work Change Proposal Request, Architect will issue a Change Order for signatures of Owner and Contractor on AIA Document G701 form included in Project Manual.
- B. "7.3.3.3. For work performed by the contractor with his own forces, there shall be added a percentage fee for the contract equal to five (5) percent overhead and five (5) percent profit maximum."
- C. "For work performed by a subcontractor, there shall be added a percentage fee for the subcontractor equal to five (5) percent overhead and five (5) percent profit, maximum. The General Contractor's combined added percentage fee for additional work performed by a subcontractor to include the subcontractor's percentage fee shall not exceed fifteen (15) percent in the aggregate."
- D. The percentage fee shall be compensation to cover the cost of supervision, overhead, bonds, profit and any other general expenses which are not included in the cost of the work as defined above.

1.6 CONSTRUCTION CHANGE DIRECTIVE

- A. Construction Change Directive: Architect may issue a Construction Change Directive on AIA Document G714 Construction Change Directive instructs Contractor to proceed with a change in the work, for subsequent inclusion in a Change Order.
 - 1. Construction Change Directive contains a complete description of change in the work. It also designates method to be followed to determine change in the Contract Sum or the Contract Time.
- B. Documentation: Maintain detailed records on a time and material basis of work required by the Construction Change Directive.
 - 1. After completion of change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.

1.7 WORK CHANGE DIRECTIVE

- A. Work Change Directive instructs Contractor to proceed with a change in the work for subsequent inclusion in a Change Order.
 - 1. Work Change Directive contains a complete description of change in the work. It also designates method to be followed to determine change in the Contract Sum or the Contract Time.
- B. Documentation: Maintain detailed records on a time and material basis of work required by the Work Change Directive.
 - 1. After completion of change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 012600

SECTION 012900 - PAYMENT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements necessary to prepare and process Applications for Payment.
- B. Related Requirements:
 - 1. Section 012600 "Contract Modification Procedures" for administrative procedures for handling changes to the Contract.
 - 2. Section 013200 "Construction Progress Documentation" for administrative requirements governing the preparation and submittal of the Contractors construction schedule.

1.3 DEFINITIONS

- A. Schedule of Values: A statement furnished by Contractor allocating portions of the Contract Sum to various portions of the work and used as the basis for reviewing Contractors Applications for Payment.

1.4 SCHEDULE OF VALUES

- A. Coordination: Coordinate preparation of the Schedule of Values with preparation of Contractors construction schedule. Cost-loaded Critical Path Method Schedule may serve to satisfy requirements for the Schedule of Values.
 - 1. Coordinate line items in the Schedule of Values with other required Administrative forms and schedules including the following:
 - a. Application for Payment forms with Continuation Sheets and Contractors Affidavit.
 - b. Submittals Schedule.
 - c. Contractors Construction Schedule.
 - 2. Submit the schedule of values to Architect at earliest possible date but no later than the second pay application.

- B. Format and Content: Use Project Manual table of contents as a guide to establish line items for the schedule of values. Provide at least one line item for each specification section.
1. Identification: Include the following Project identification on the Schedule of Values:
 - a. Project name and location.
 - b. Name of Architect.
 - c. Architects project number.
 - d. Contractors name and address.
 - e. Date of submittal.
 2. Arrange schedule of values consistent with format of AIA Document G703.
 3. Arrange the schedule of values in tabular form with separate columns to indicate the following for each item listed:
 - a. Related specification section or division.
 - b. Description of the work.
 - c. Name of Subcontractors
 - d. Name of manufacturer or fabricator.
 - e. Name of supplier.
 - f. Change Orders (numbers) that affect value.
 - g. Dollar value of the following, as a percentage of the Contract Sum to nearest one-hundredth percent, adjusted to total 100 percent. Round dollar amounts to whole dollars, with total equal to Contract Sum.
 - 1) Labor.
 - 2) Materials.
 - 3) Equipment.
 4. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Provide multiple line items for principal subcontract amounts in excess of five percent of the Contract Sum.
 5. Provide a separate line item in the Schedule of Values for each part of the work where Applications for Payment may include materials or equipment purchased or fabricated and stored but not yet installed.
 - a. Differentiate between items stored on-site and items stored off-site.
 6. Allowances: Provide a separate line item in the schedule of values for each allowance. Show line-item value of unit-cost allowances, as a product of the unit cost, multiplied by measured quantity. Use information indicated in the Contract Documents to determine quantities.
 7. Alternates: Provide a separate line item in the schedule of values for each alternate. Show line-item value of unit-costs, as a product of the unit cost, multiplied by measured quantity. Use information indicated in the Contract Documents to determine quantities.
 8. Overhead Costs: Include total cost and proportionate share of general overhead and profit for each line item.

9. Overhead Costs: Show cost of temporary facilities and other major cost items that are not direct cost of actual work-in-place as separate line items.
10. Closeout Costs. Include separate line items under Contractor and principal subcontractors for Project closeout requirements in an amount totaling five percent of the Contract Sum and subcontract amount.
11. Schedule of Values Revisions: Revise the schedule of values when Change Orders or Construction Change Directives result in a change in the Contract Sum. Include at least one separate line item for each Change Order and Construction Change Directive.

1.5 APPLICATIONS FOR PAYMENT

- A. Each Application for Payment following the initial Application for Payment shall be consistent with previous applications and payments as certified by Architect and paid for by Owner.
 1. Initial Application for Payment at time of Substantial Completion and final Application for Payment involve additional requirements.
- B. Each Application for Payment shall include the Contractors Affidavit signed and notarized. This form is contained in the specification following the Application for Payment and the Continuation Sheet.
- C. Each Application for Payment shall include a current updated project schedule as identified in Section 013200 "Construction Progress Documentation".
- D. The period covered by each Application for Payment is one-month, ending on the last day of the month.
- E. Payment Application Forms: Use AIA Document G702 and AIA Document G703 Continuation Sheets as form for Applications for Payment.
- F. Each Application for Payment shall include a review of all, up to date, as-built drawings prior to approval.
- G. Application Preparation: Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of Contractor. Architect will return incomplete applications without action.
 1. Entries shall match data on the schedule of values and Contractors construction schedule. Use updated schedules if revisions were made.
 2. Include amounts for work completed following previous Application for Payment, whether or not payment has been received. Include only amounts for work completed at time of Application for Payment.
 3. Include amounts of Change Orders and Construction Change Directives issued before last day of construction period covered by application.

- H. Stored Materials: Include in Application for Payment amounts applied for materials or equipment purchased or fabricated and stored but not yet installed. Differentiate between items stored on-site and items stored off-site.
1. Provide certificate of insurance, evidence of transfer of title to Owner and consent of surety to payment for stored materials.
 2. Provide supporting documentation that verifies amount requested, such as paid invoices. Match amount requested with amounts indicated on documentation; do not include overhead and profit on stored materials.
 3. Provide summary documentation for stored materials indicating the following:
 - a. Value of materials previously stored and remaining stored as of date of previous Applications for Payment.
 - b. Value of previously stored materials put in place after date of previous Application for Payment and on or before date of current Application for Payment.
 - c. Value of materials stored since date of previous Application for Payment and remaining stored as of date of current Application for Payment.
- I. Transmittal: Submit three signed and notarized original copies of each Application for Payment to Architect by a method ensuring receipt within 24-hours. One copy shall include waivers of lien and similar attachments if required.
1. Transmit each copy with a transmittal form listing attachments and recording appropriate information about application.
- J. Waivers of Mechanics Lien: With each Application for Payment, submit waivers of mechanics lien from Contractor, Subcontractors and Suppliers for construction period covered by the previous application.
1. Submit partial waivers on each item for amount requested in previous application, after deduction for retainage, on each item.
 2. When an application shows completion of an item submit conditional final or full waivers.
 3. Owner reserves the right to designate which entities involved in the work must submit waivers.
 4. Submit final Application for Payment with or preceded by conditional final waivers from every entity involved with performance of the work covered by the application who is lawfully entitled to a lien.
 5. Waiver Forms: Submit executed waivers of lien on forms acceptable to Owner.
- K. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of first Application for Payment include the following:
1. List of Subcontractors.
 2. Schedule of values.
 3. Contractors construction schedule (preliminary if not final).
 4. Combined Contractors construction schedule (preliminary if not final)
 5. Products list (preliminary if not final).
 6. Submittal schedule (preliminary if not final).
 7. List of Contractors staff assignments.

8. Copies of building permits.
 9. Copies of authorizations and licenses from authorities having jurisdiction for performance of the work.
 10. Initial progress report.
 11. Report of preconstruction conference.
 12. Certificates of insurance and insurance policies.
 13. Performance and payment bonds.
 14. Data needed to acquire Owners insurance.
- L. Application for Payment at Substantial Completion: After Architect issues the Certificate of Substantial Completion, submit an Application for Payment showing 100 percent completion for portion of the work claimed as substantially complete.
1. Include documentation supporting claim that the work is substantially complete and a statement showing an accounting of changes to the Contract Sum.
 2. This application shall reflect Certificate(s) of Substantial Completion issued previously for Owner occupancy of designated portions of the work.
- M. Final Payment Application: After completing Project closeout requirements, submit final Application for Payment with releases and supporting documentation not previously submitted and accepted, including but not limited to the following:
1. Evidence of completion of Project closeout requirements.
 2. Insurance certificates for products and completed operations where required and proof that taxes, fees and similar obligations were paid.
 3. Updated final statement, accounting for final changes to the Contract Sum.
 4. AIA Document G706.
 5. AIA Document G706A.
 6. AIA Document G707.
 7. Evidence that claims have been settled.
 8. Final meter readings for utilities, a measured record of stored fuel and similar data as of date of Substantial Completion or when Owner took possession of and assumed responsibility for corresponding elements of the work.
 9. Final liquidated damages settlement statement.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 012900

SECTION 013100 - PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this section.

1.2 SUMMARY

- A. Section includes administrative provisions for coordinating construction operations on Project including but not limited to the following:
 - 1. General coordination procedures.
 - 2. Coordination drawings.
 - 3. RFIs.
 - 4. Project meetings.
- B. Each Contractor shall participate in coordination requirements. Certain areas of responsibility are assigned to a specific Contractor.
- C. Related Requirements:
 - 1. Section 013200 "Construction Progress Documentation" for preparing and submitting Contractors construction schedule.
 - 2. Section 017300 "Execution" for procedures for coordinating general installation and field-engineering services, including establishment of benchmarks and control points.
 - 3. Section 017700 "Closeout Procedures" for coordinating closeout of the Contract.

1.3 DEFINITIONS

- A. RFI: Request for Information. Request from Owner, Architect or Contractor seeking information required by or clarifications of the Contract Documents.

1.4 INFORMATIONAL SUBMITTALS

- A. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the work, including those who are to furnish products or equipment fabricated to a special design. Include the following information in tabular form:
 - 1. Name, address, telephone number and email address of entity performing subcontract or supplying products.
 - 2. Number and title of related specification section(s) covered by subcontract.

3. Drawing number and detail references, as appropriate, covered by subcontract.
- B. Key Personnel Names: Within 10-days of starting construction operations, submit a list of key personnel assignments, including superintendent and other personnel in attendance at Project site. Identify individuals and their duties and responsibilities; list addresses and cellular telephone numbers and e-mail addresses. Provide names, addresses and telephone numbers of individuals assigned as alternates in the absence of individuals assigned to Project.
 1. Post copies of list in project meeting room and in temporary field office. Keep list current at all times.

1.5 GENERAL COORDINATION PROCEDURES

- A. Coordination: Coordinate construction operations included in different sections of the specifications to ensure efficient and orderly installation of each part of the work. Coordinate construction operations included in different sections that depend on each other for proper installation, connection and operation.
 1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the work depends on installation of other components before or after its own installation.
 2. Coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service and repair.
 3. Make adequate provisions to accommodate items scheduled for later installation.
 4. Where availability of space is limited, coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service and repair of all components, including Mechanical and Electrical.
- B. Coordination: Each Contractor shall coordinate its construction operations with those of other Contractors and entities to ensure efficient and orderly installation of each part of the work. Each Contractor shall coordinate its own operations with operations included in different sections that depend on each other for proper installation, connection and operation.
 1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the work depends on installation of other components, before or after its own installation.
 2. Coordinate installation of different components with other Contractors to ensure maximum performance and accessibility for required maintenance, service and repair.
 3. Make adequate provisions to accommodate items scheduled for later installation.
- C. Prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports and list of attendees at meetings.
 1. Prepare similar memoranda for Owner and separate Contractors if coordination of their work is required.

- D. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities and scheduled activities of other Contractors to avoid conflicts and to ensure orderly progress of the work. Such administrative activities include but are not limited to the following:

1. Preparation of Contractors construction schedule.
2. Preparation of the schedule of values.
3. Installation and removal of temporary facilities and controls.
4. Delivery and processing of submittals.
5. Progress meetings.
6. Pre-installation conferences.
7. Project closeout activities.
8. Startup and adjustment of systems.
9. Project closeout activities, including demonstration and training.

1.6 COORDINATION DRAWINGS

- A. Coordination Drawings, General: Prepare coordination drawings according to requirements in individual sections and additionally where installation is not completely indicated on shop drawings, where limited space availability necessitates coordination or if coordination is required to facilitate integration of products and materials fabricated or installed by more than one entity.

1. Content: Project-specific information, drawn accurately to a scale large enough to indicate and resolve conflicts. Do not base coordination drawings on standard printed data. Include the following information, as applicable:
 - a. Use applicable drawings as a basis for preparation of coordination drawings. Prepare sections, elevations and details as needed to describe relationship of various systems and components.
 - b. Coordinate the addition of trade specific information to coordination drawings in a sequence that best provides for coordination of the information and resolution of conflicts between installed components before submitting for review.
 - c. Indicate functional and spatial relationships of components of Architectural, Structural, Civil, Mechanical and Electrical systems.
 - d. Indicate space requirements for routine maintenance and for anticipated replacement of components during the life of the installation.
 - e. Show location and size of access doors required for access to concealed dampers, valves and other controls.
 - f. Indicate required installation sequences.
 - g. Indicate dimensions shown on drawings. Specifically note dimensions that appear to be in conflict with submitted equipment and minimum clearance requirements. Provide alternative sketches to Architect indicating proposed resolution of such conflicts. Minor dimension changes and difficult installations will not be considered changes to the Contract.

- B. Coordination Drawing Organization: Organize coordination drawings as follows:

1. Floor Plans and Reflected Ceiling Plans: Show architectural and structural elements and mechanical, plumbing, fire-protection, fire-alarm and electrical work. Show locations of visible ceiling-mounted devices relative to acoustical ceiling grid. Supplement plan drawings with section drawings where required to adequately represent the work.
2. Plenum Space: Indicate sub-framing for support of ceiling and wall systems, mechanical and electrical equipment and related work. Locate components within plenums to accommodate layout of light fixtures and other components indicated on drawings. Indicate areas of conflict between light fixtures and other components.
3. Mechanical Rooms: Provide coordination drawings for mechanical rooms showing plans and elevations of mechanical, plumbing, fire-protection, fire-alarm and electrical equipment.
4. Structural Penetrations: Indicate penetrations and openings required for all disciplines.
5. Slab Edge and Embedded Items: Indicate slab edge locations and sizes and locations of embedded items for metal fabrications, sleeves, anchor bolts, bearing plates, angles, door floor closers, slab depressions for floor finishes, curbs and housekeeping pads and similar items.
6. Mechanical and Plumbing Work: Show the following:
 - a. Sizes and bottom elevations of ductwork, piping and conduit runs, including insulation, bracing, flanges and support systems.
 - b. Dimensions of major components, such as dampers, valves, diffusers, access doors, cleanouts and electrical distribution equipment.
 - c. Fire-rated enclosures around ductwork.
7. Electrical Work: Show the following:
 - a. Runs of vertical and horizontal conduit 1-1/4-inches in diameter and larger.
 - b. Light fixture, exit light, emergency battery pack, smoke detector and other fire-alarm locations.
 - c. Panel board, switch board, switchgear, transformer, busway, generator and motor-control center locations.
 - d. Location of pull boxes and junction boxes, dimensioned from column center lines.
8. Fire-Protection System: Show the following:
 - a. Locations of standpipes, mains piping, branch lines, pipe drops and sprinkler heads.
9. Review: Architect will review coordination drawings to confirm that in general the work is being coordinated but not for the details of the coordination, which are Contractors responsibility. If Architect determines that coordination drawings are not being prepared in sufficient scope or detail or are otherwise deficient, Architect will so inform Contractor, who shall make suitable modifications and resubmit.
10. Coordination Drawing Prints: Prepare coordination drawing prints according to requirements in Section 013300 "Submittal Procedures."

- C. Virtual Design and Construction (VDC), Building Information Model (BIM) and Coordination Digital Data Files:
 - 1. General: It is expected that, to the greatest extent applicable, Contractor will employ VDC and BIM tools to facilitate the construction, coordination, and the Work.
 - 2. Contractor's VDC implementation shall at a minimum include items listed in this section under item 1.6 B : Coordination Drawing Organization.

1.7 REQUEST FOR INFORMATION (RFI)

- A. General: Immediately on discovery of the need for additional information, clarification or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI in the form specified.
 - 1. Architect will return without response those RFIs submitted to Architect by other entities controlled by Contractor.
 - 2. Coordinate and submit RFIs in a prompt manner so as to avoid delays in Contractors work or work of Subcontractors.
- B. Content of the RFI: Include a detailed, legible description of item needing information or interpretation and the following:
 - 1. Project name.
 - 2. Project number.
 - 3. Date.
 - 4. Name of Contractor.
 - 5. Name of Architect.
 - 6. RFI number, numbered sequentially.
 - 7. RFI subject.
 - 8. Specification section number and title and related paragraphs, as appropriate.
 - 9. Drawing number and detail references, as appropriate.
 - 10. Field dimensions and conditions, as appropriate.
 - 11. Contractors suggested resolution. If Contractors suggested resolution impacts the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
 - 12. Contractors signature.
 - 13. Attachments: Include sketches, descriptions, measurements, photos, product data, shop drawings, coordination drawings and other information necessary to fully describe items needing interpretation.
 - a. Include dimensions, thicknesses, structural grid references and details of affected materials, assemblies and attachments on attached sketches.
- C. Architects Action: Architect will review each RFI, determine action required and respond. Allow 7-working days for Architects response for each RFI. RFIs received by Architect after 1:00 p.m. will be considered as received the following working day.
 - 1. The following Contractor-generated RFIs will be returned without action:

- a. Requests for approval of submittals.
 - b. Requests for approval of substitutions.
 - c. Requests for approval of Contractors means and methods.
 - d. Requests for coordination information already indicated in the Contract Documents.
 - e. Requests for adjustments in the Contract Time or the Contract Sum.
 - f. Requests for interpretation of Architects actions on submittals.
 - g. Incomplete RFIs or inaccurately prepared RFIs.
 - 2. Architects action may include a request for additional information, in which case Architects time for response will date from time of receipt by Architect of additional information.
 - 3. Architects action on RFIs that may result in a change to the Contract Time or the Contract Sum may be eligible for Contractor to submit Change Proposal according to Section 01 26 00 "Contract Modification Procedures."
 - a. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Architect in writing within 10-days of receipt of the RFI response.
- D. RFI Log: Prepare, maintain and submit a tabular log of RFIs organized by the RFI number. Submit log monthly to Include the following:
- 1. Project name.
 - 2. Name and address of Contractor.
 - 3. Name and address of Architect.
 - 4. RFI number including RFIs that were returned without action or withdrawn.
 - 5. RFI description.
 - 6. Date the RFI was submitted.
 - 7. Date Architects response was received.
 - 8. Identification of related minor change in the work, Construction Change Directive and Proposal Request, as appropriate.
 - 9. Identification of related Field Order, Work Change Directive and Proposal Request, as appropriate.
- E. On receipt of Architects action, update the RFI log and immediately distribute the RFI response to affected parties. Review response and notify Architect within seven-days if Contractor disagrees with response.

1.8 DIGITAL PROJECT MANAGEMENT PROCEDURES

- A. Use of Architects Digital Data Files: Digital data files of Architects will be provided by Architect for Contractors use during construction.
 - 1. Digital data files may be used by Contractor in preparing coordination drawings, shop drawings and project record drawings.
 - 2. Architect makes no representations as to the accuracy or completeness of digital data files as they relate to Contract Drawings.
 - 3. The following digital data files will be furnished for each appropriate discipline:

- a. Floor plans.
 - b. Reflected ceiling plans.
- B. PDF Document Preparation: Where PDFs are required to be submitted to Architect, prepare as follows:
 - 1. Assemble complete submittal package into a single indexed file incorporating submittal requirements of a single specification section and transmittal form with links enabling navigation to each item.
 - 2. Name file with submittal number or other unique identifier, including revision identifier.
 - 3. Certifications: Where digitally submitted certificates and certifications are required, provide a digital signature with digital certificate on where indicated.

1.9 PROJECT MEETINGS

- A. General: Schedule and conduct meetings and conferences at Project site unless otherwise indicated.
 - 1. Attendees: Inform participants and others involved and individuals whose presence is required, of date and time of each meeting. Notify Owner and Architect of scheduled meeting dates and times.
 - 2. Agenda: Prepare the meeting agenda. Distribute the agenda to all invited attendees.
 - 3. Minutes: Entity responsible for conducting meeting will record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including Owner and Architect, within three-days of the meeting.
- B. Pre-construction Conference: Schedule and conduct a pre-construction conference before starting construction, at a time convenient to Owner and Architect, but no later than fifteen-days after execution of the Agreement.
 - 1. Attendees: Authorized representatives of Owner, Architect and their consultants; Contractor and its superintendent; major subcontractor, suppliers and other concerned parties shall attend the conference. Participants at the conference shall be familiar with Project and authorized to conclude matters relating to the work.
 - 2. Agenda: Discuss items of significance that could affect progress, including the following:
 - a. Responsibilities and personnel assignments.
 - b. Tentative construction schedule.
 - c. Critical work sequencing and long lead items.
 - d. Designation of key personnel and their duties.
 - e. Lines of communications.
 - f. Procedures for processing field decisions and Change Orders.
 - g. Procedures for RFIs.
 - h. Procedures for testing and inspecting.
 - i. Procedures for processing Applications for Payment.

- j. Distribution of the Contract Documents.
 - k. Submittal procedures.
 - l. Preparation of Record Documents.
 - m. Use of the premises.
 - n. Work restrictions.
 - o. Working hours.
 - p. Owners occupancy requirements.
 - q. Responsibility for temporary facilities and controls.
 - r. Construction waste management and recycling.
 - s. Parking availability.
 - t. Office, work and storage areas.
 - u. Equipment deliveries and priorities.
 - v. First aid.
 - w. Security.
 - x. Progress cleaning.
 - y. Working hours.
3. Minutes: The Architect will record and distribute meeting minutes of the pre-construction conference.
- C. Pre-installation Conferences: Conduct a pre-installation conference at Project site before each construction activity when required by other sections and when required for coordination with other construction.
- 1. Attendees: Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise Architect of scheduled meeting dates.
 - 2. Agenda: Review progress of other construction activities and preparations for the particular activity under consideration, including requirements for the following:
 - a. Contract Documents.
 - b. Options.
 - c. Related RFIs.
 - d. Related Change Orders.
 - e. Purchases.
 - f. Deliveries.
 - g. Submittals.
 - h. Review of mockups.
 - i. Possible conflicts.
 - j. Compatibility requirements.
 - k. Time schedules.
 - l. Weather limitations.
 - m. Manufacturers written instructions.
 - n. Warranty requirements.
 - o. Compatibility of materials.
 - p. Acceptability of substrates.
 - q. Temporary facilities and controls.
 - r. Space and access limitations.
 - s. Regulations of authorities having jurisdiction.
 - t. Testing and inspecting requirements.

- u. Installation procedures.
 - v. Coordination with other work.
 - w. Required performance results.
 - x. Protection of adjacent work.
 - y. Protection of construction and personnel.
3. Record significant conference discussions, agreements and disagreements, including required corrective measures and actions.
 4. Reporting: The Contractor will record and distribute the minutes of all pre-installation conferences. Distribute minutes of the meeting to the Architect and to each party present and to other parties requiring information.
 5. Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the work and reconvene the conference at earliest feasible date.
- D. Project Closeout Conference: Schedule and conduct a project closeout conference, at a time convenient to Owner and Architect, but no later than 60-days prior to the scheduled date of Substantial Completion.
1. Conduct the conference to review requirements and responsibilities related to Project closeout.
 2. Attendees: Authorized representatives of Owner, Architect and their consultants; Contractor and its superintendent; major subcontractors, suppliers and other concerned parties shall attend the meeting. Participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the work.
 3. Agenda: Discuss items of significance that could affect or delay Project closeout, including the following:
 - a. Preparation of record documents.
 - b. Procedures required prior to inspection for Substantial Completion and for final inspection for acceptance.
 - c. Submittal of written warranties.
 - d. Requirements for preparing operations and maintenance data.
 - e. Requirements for delivery of material samples, attic stock and spare parts.
 - f. Requirements for demonstration and training.
 - g. Preparation of Contractors punch list.
 - h. Procedures for processing Applications for Payment at Substantial Completion and for final payment.
 - i. Submittal procedures.
 - j. Coordination of separate contracts.
 - k. Owners partial occupancy requirements.
 - l. Installation of Owners furniture, fixtures and equipment.
 - m. Responsibility for removing temporary facilities and controls.
 4. Minutes: The Contractor will record and distribute meeting minutes of the Project Close-out Conference.
- E. Owner/Architect/Contractor (OAC) Progress Meetings: Conduct progress meetings at weekly intervals.
1. Coordinate dates of meetings with preparation of payment requests.

2. Attendees: In addition to representatives of Owner and Architect, Contractor, Subcontractors, Suppliers and other entity concerned with current progress or involved in planning, coordination or performance of future activities shall be represented at these meetings. All participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the work.
3. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
 - a. Contractors Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule or behind schedule, in relation to Contractors construction schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
 - 1) Review schedule for next period.
 - b. Review present and future needs of each entity present, including the following:
 - 1) Interface requirements.
 - 2) Sequence of operations.
 - 3) Status of submittals.
 - 4) Status of sustainable design documentation.
 - 5) Deliveries.
 - 6) Off-site fabrication.
 - 7) Access.
 - 8) Site use.
 - 9) Temporary facilities and controls.
 - 10) Work hours
 - 11) Hazards and risks.
 - 12) Progress cleaning.
 - 13) Quality and work standards.
 - 14) Status of correction of deficient items.
 - 15) Field observations.
 - 16) Status of RFIs.
 - 17) Status of Proposal Requests.
 - 18) Pending changes.
 - 19) Status of Change Orders.
 - 20) Pending claims and disputes.
 - 21) Documentation of information for payment requests.
4. Minutes: The Contractor will record and distribute the OAC Meeting minutes along with the agenda for the next meeting, to each party present and to parties requiring information 48-hours prior to the next scheduled OAC Meeting.
 - a. Schedule Updating: Revise Contractors construction schedule after each progress meeting where revisions to the schedule have been made or

recognized. Issue revised schedule concurrently with the report of each meeting.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 013100

SECTION 013200 - CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for documenting the progress of construction during performance of the work, including the following:
 - 1. Startup construction schedule.
 - 2. Contractors Construction Schedule.
 - 3. Construction schedule updating reports.
 - 4. Daily construction reports.
 - 5. Material location reports.
 - 6. Site condition reports.
 - 7. Unusual event reports.
- B. Related Requirements:
 - 1. Section 012900 "Payment Procedures" for submitting the Schedule of Values.
 - 2. Section 013100 "Project Management and Coordination" for submitting and distributing meeting and conference minutes.
 - 3. Section 013233 "Photographic Documentation" for submitting preconstruction photographs, periodic construction photographs and final completion construction photographs.
 - 4. Section 013300 "Submittal Procedures" for submitting schedules and reports.
 - 5. Section 014000 "Quality Requirements" for submitting a schedule of tests and inspections.

1.3 DEFINITIONS

- A. Activity: A discrete part of a project that can be identified for planning, scheduling, monitoring and controlling the construction Project. Activities included in a construction schedule consume time and resources.
 - 1. Critical Activity: An activity on the critical path that must start and finish on the planned early start and finish times.
 - 2. Predecessor Activity: An activity that precedes another activity in the network.
 - 3. Successor Activity: An activity that follows another activity in the network.

- B. Cost Loading: The allocation of the schedule of values for completing an activity as scheduled. The sum of costs for all activities must equal the total Contract Sum.
- C. CPM: Critical path method, which is a method of planning and scheduling a construction project where activities are arranged based on activity relationships. Network calculations determine when activities can be performed and the critical path of Project.
- D. Critical Path: The longest connected chain of interdependent activities through the network schedule that establishes the minimum overall Project duration and contains no float.
- E. Event: The starting or ending point of an activity.
- F. Float: The measure of leeway in starting and completing an activity.
 - 1. Float time is not for the exclusive use or benefit of either Owner or Contractor, but is a jointly owned, expiring Project resource available to both parties as needed to meet schedule milestones and Contract completion date.
 - 2. Free float is the amount of time an activity can be delayed without adversely affecting the early start of the successor activity.
 - 3. Total float is the measure of leeway in starting or completing an activity without adversely affecting the planned Project completion date.
- G. Resource Loading: The allocation of manpower and equipment necessary for completing an activity as scheduled.
- H. Fragnet: A partial or fragmentary network that breaks down activities into smaller activities for greater detail.
- I. Major Area: A story of construction, a separate building or a similar significant construction element.
- J. Milestone: A key or critical point in time for reference or measurement.
- K. Network Diagram: A graphic diagram of a network schedule, showing activities and activity relationships.
- L. Resource Loading: The allocation of manpower and equipment necessary for the completion of an activity as scheduled.

1.4 INFORMATIONAL SUBMITTALS

- A. Format for Submittals: Submit required submittals in the following format:
 - 1. Working electronic copy of schedule file, where indicated.
 - 2. PDF file.
 - 3. Three paper copies, of sufficient size to display entire period or schedule, as required.

- B. Startup construction schedule.
 - 1. Submittal of cost-loaded, startup construction schedule will not constitute approval of schedule of values for cost-loaded activities.
- C. Startup Network Diagram: Of size required to display entire network for entire construction period. Show logic ties for activities.
- D. Contractors Construction Schedule: Initial schedule, of size required to display entire schedule for entire construction period.
 - 1. Submit a working digital copy of schedule, using software indicated and labeled to comply with requirements for submittals.
- E. CPM Reports: Concurrent with CPM schedule, submit each of the following reports. Format for each activity in reports shall contain activity number, activity description, cost and resource loading original duration, remaining duration, early start date, early finish date, late start date, late finish date and total float in calendar-days.
 - 1. Activity Report: List of activities sorted by activity number and then early start date or actual start date if known.
 - 2. Logic Report: List of preceding and succeeding activities for each activity, sorted in ascending order by activity number and then by early start date or actual start date if known.
 - 3. Total Float Report: List of activities sorted in ascending order of total float.
- F. Construction Schedule Updating Reports: Submit with Applications for Payment.
- G. Daily Construction Reports: Submit at monthly intervals.
- H. Material Location Reports: Submit at monthly intervals.
- I. Site Condition Reports: Submit at time of discovery of differing conditions.
- J. Unusual Event Reports: Submit at time of unusual event.
- K. Qualification Data: For scheduling consultant.

1.5 QUALITY ASSURANCE

- A. Scheduling Consultant Qualifications: An experienced specialist in CPM scheduling and reporting, with capability of producing CPM reports and diagrams within 24-hours of Architects request.
- B. Pre-scheduling Conference: Conduct conference at Project site to comply with requirements in Section 013100 "Project Management and Coordination." Review methods and procedures related to the preliminary construction schedule and Contractors Construction Schedule including but not limited to the following:
 - 1. Verify availability of qualified personnel needed to develop and update schedule.
 - 2. Discuss constraints:

3. Review delivery dates for Owner furnished products.
4. Review schedule for work of Owners separate contracts.
5. Review submittal requirements and procedures.
6. Review time required for review of submittals and resubmittals.
7. Review requirements for tests and inspections by independent testing and inspecting agencies.
8. Review time required for Project closeout and Owner startup procedures.
9. Review and finalize list of construction activities to be included in schedule.
10. Review procedures for updating schedule.

1.6 COORDINATION

- A. Coordinate Contractors Construction Schedule with the schedule of values, schedule, progress reports, payment requests and other required schedules and reports.
 1. Secure time commitments for performing critical elements of the work from entities involved.
 2. Coordinate each construction activity in the network with other activities and schedule them in proper sequence.

1.7 PRELIMINARY CONSTRUCTION SCHEDULE

- A. Bar-Chart Schedule: Submit preliminary horizontal bar-chart-type construction schedule within 7-days of date established for the Notice to Proceed.
- B. Preparation: Indicate each significant construction activity separately. Identify first workday of each week with a continuous vertical line. Outline significant construction activities for first 60-days of construction. Include skeleton diagram for the remainder of the work and a cash requirement prediction based on indicated activities.

1.8 CONTRACTORS CONSTRUCTION SCHEDULE, GENERAL

- A. Time Frame: Full Project Schedule: Extend schedule from date established for the Notice to Proceed to date of Final Completion.
 1. Contract completion date shall not be changed by submission of a schedule that shows an early completion date, unless specifically authorized by Change Order.
- B. Time Frame: 4-Week Look Ahead Schedule: Extend schedule from current date to 4 weeks in the future. Prepare new 4-week look ahead schedule along with the agenda for each OAC meeting.
- C. Activities: Treat each floor or separate area as a separate numbered activity for each main element of the work. Comply with the following:
 1. Activity Duration: Define activities so no activity is longer than 20-days, unless specifically allowed by Architect.

2. Procurement Activities: Include procurement process activities for the following long lead items and major items, requiring a cycle of more than 60-days, as separate activities in schedule. Procurement cycle activities include, but are not limited to submittals, approvals, purchasing, fabrication and delivery.
 3. Submittal Review Time: Include review and resubmittal times indicated in Section 01 33 00 "Submittal Procedures" in schedule. Coordinate submittal review times in Contractors Construction Schedule with submittal schedule.
 4. Startup and Testing Time: Include no fewer than 14-days for startup and testing.
 5. Substantial Completion: Indicate completion in advance of date established for Substantial Completion and allow time for Architects administrative procedures necessary for certification of Substantial Completion.
 6. Punch List and Final Completion: Include not more than 30-days for completion of punch list items and final completion.
- D. Constraints: Include constraints and work restrictions indicated in the Contract Documents and as follows in schedule and show how the sequence of the work is affected.
1. Work by Owner: Include a separate activity for each portion of the work performed by Owner.
 2. Products Ordered in Advance: Include a separate activity for each product. Include delivery date indicated in Section 011000 "Summary." Delivery dates indicated stipulate the earliest possible delivery date.
 3. Owner-Furnished Products: Include a separate activity for each product. Include delivery date indicated in Section 011000 "Summary." Delivery dates indicated stipulate the earliest possible delivery date.
 4. Work Restrictions: Show the effect of the following items on the schedule:
 - a. Partial occupancy before Substantial Completion.
 - b. Use-of-premises restrictions.
 - c. Seasonal variations.
 5. Work Stages: Indicate important stages of construction for each major portion of the work including but not limited to the following:
 - a. Subcontract awards.
 - b. Submittals.
 - c. Purchases.
 - d. Mockups.
 - e. Fabrication.
 - f. Sample testing.
 - g. Deliveries.
 - h. Installation.
 - i. Tests and inspections.
 - j. Adjusting.
 - k. Curing.
 - l. Startup and placement into final use and operation.
 6. Construction Areas: Identify each major area of construction for each major portion of the work. Indicate where each construction activity within a major area

must be sequenced or integrated with other construction activities to provide for the following:

- a. Structural completion.
 - b. Temporary enclosure and space conditioning.
 - c. Permanent space enclosure.
 - d. Completion of mechanical installation.
 - e. Completion of electrical installation.
 - f. Substantial Completion.
- E. Milestones: Include milestones indicated in the Contract Documents in schedule, including but not limited to the Notice to Proceed, Substantial Completion and Final Completion.
- F. Cost Correlation: Superimpose a cost correlation timeline, indicating planned and actual costs. On the line, show planned and actual dollar volume of the work performed as of planned and actual dates used for preparation of payment requests.
1. See Section 012900 "Payment Procedures" for cost reporting and payment procedures.
- G. Upcoming Work Summary: Prepare summary report indicating activities scheduled to occur or commence prior to submittal of next schedule update. Summarize the following issues:
1. Unresolved issues.
 2. Unanswered Requests for Information.
 3. Rejected or unreturned submittals.
 4. Notations on returned submittals.
 5. Pending modifications affecting the work and the Contract Time.
- H. Contractors Construction Schedule Updating: At monthly intervals, update schedule to reflect actual construction progress and activities and submit with each Application for Payment.
1. Revise schedule immediately after each meeting or other activity where revisions have been recognized or made. Issue updated schedule concurrently with the report of each such meeting.
 2. Include a report with updated schedule that indicates every change, including, but not limited to, changes in logic, durations, actual starts and finishes and activity durations.
 3. As the work progresses, indicate final completion percentage for each activity.
- I. Recovery Schedule: When periodic update indicates the work is 14 or more calendar-days behind the current approved schedule, submit a separate recovery schedule indicating means by which Contractor intends to regain compliance with the schedule. Indicate changes to working hours, working-days, crew sizes, equipment required to achieve compliance and date by which recovery will be accomplished.

- J. Distribution: Distribute copies of approved schedule to Architect, Owner, separate Contractors, testing and inspecting agencies and other parties identified by Contractor with a need-to-know schedule responsibility.
 - 1. Post copies in Project meeting rooms and temporary field offices.
 - 2. When revisions are made, distribute updated schedules to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the work and are no longer involved in performance of construction activities.

1.9 STARTUP CONSTRUCTION SCHEDULE

- A. Gantt-Chart Schedule: Submit startup, horizontal, Gantt-chart-type construction schedule within seven-days of date established for commencement of the work.
- B. Preparation: Indicate each significant construction activity separately. Identify first workday of each week with a continuous vertical line. Outline significant construction activities for first 90-days of construction. Include skeleton diagram for the remainder of the work and a cash requirement prediction based on indicated activities.

1.10 GANTT-CHART SCHEDULE REQUIREMENTS

- A. Gantt-Chart Schedule: Submit a comprehensive, fully developed, horizontal, Gantt-chart-type, Contractors Construction Schedule within 30-days of date established for commencement of the work.
 - 1. Base schedule on the startup construction schedule and additional information received since the start of Project.
- B. Preparation: Indicate each significant construction activity separately. Identify first workday of each week with a continuous vertical line.
 - 1. For construction activities that require three months or longer to complete, indicate an estimated completion percentage in 10 percent increments within time bar.

1.11 CPM SCHEDULE REQUIREMENTS

- A. General: Prepare network diagrams using AON (activity-on-node) format.
- B. Startup Network Diagram: Submit diagram within 14-days of date established for commencement of the work. Outline significant construction activities for the first 90-days of construction. Include skeleton diagram for the remainder of the work and a cash requirement prediction based on indicated activities.
- C. CPM Schedule: Prepare Contractors Construction Schedule using a cost and resource-loaded, time-scaled CPM network analysis diagram for the work.

1. Develop network diagram in sufficient time to submit CPM schedule so it can be accepted for use no later than 60-days after date established for commencement of the work.
 - a. Failure to include any work item required for performance of this Contract shall not excuse Contractor from completing all work within applicable completion dates.
 2. Conduct educational workshops to train and inform key Project personnel, including Subcontractors personnel, in proper methods of providing data and using CPM schedule information.
 3. Establish procedures for monitoring and updating CPM schedule and for reporting progress. Coordinate procedures with progress meeting and payment request dates.
 4. Use "one workday" as the unit of time for individual activities. Indicate non-working-days and holidays incorporated into the schedule to coordinate with the Contract Time.
- D. CPM Schedule Preparation: Prepare a list of all activities required to complete the Work. Using the startup network diagram, prepare a skeleton network to identify probable critical paths.
1. Activities: Indicate the estimated time duration, sequence requirements and relationship of each activity in relation to other activities. Include estimated time frames for the following activities:
 - a. Preparation and processing of submittals.
 - b. Mobilization and demobilization.
 - c. Purchase of materials.
 - d. Delivery.
 - e. Fabrication.
 - f. Utility interruptions.
 - g. Installation.
 - h. Work by Owner that may affect or be affected by Contractors activities.
 - i. Testing and inspection.
 - j. Punch list and final completion.
 2. Critical Path Activities: Identify critical path activities, including those for interim completion dates. Scheduled start and completion dates shall be consistent with Contract milestone dates.
 3. Processing: Process data to produce output data on a computer-drawn, time-scaled network. Revise data, reorganize activity sequences and reproduce as often as necessary to produce the CPM schedule within the limitations of the Contract Time.
 4. Format: Mark the critical path. Locate the critical path near center of network; locate paths with most float near the edges.
 - a. Subnetworks on separate sheets are permissible for activities clearly off the critical path.

5. Cost and Resource-Loading of CPM Schedule: Assign cost to construction activities on the CPM schedule. Do not assign costs to submittal activities. Obtain Architects approval prior to assigning costs to fabrication and delivery activities. Assign costs under main subcontracts for testing and commissioning activities, operation and maintenance manuals, punch list activities, Project record documents and demonstration and training in the amount of 5 percent of the Contract Sum.
 - a. Each activity cost shall reflect an appropriate value subject to approval by Architect.
 - b. Total cost assigned to activities shall equal the total Contract Sum.
- E. Contract Modifications: For each proposed contract modification and concurrent with its submission, prepare a time-impact analysis using a network fragment to demonstrate the effect of the proposed change on the overall Project schedule.
- F. Initial Issue of Schedule: Prepare initial network diagram from a sorted activity list indicating straight "early start-total float." Identify critical activities. Prepare tabulated reports showing the following:
 1. Contractor or Subcontractors and the work or activity.
 2. Description of activity.
 3. Main events of activity.
 4. Immediate preceding and succeeding activities.
 5. Early and late start dates.
 6. Early and late finish dates.
 7. Activity duration in workdays.
 8. Total float or slack time.
 9. Average size of workforce.
 10. Dollar value of activity (coordinated with the schedule of values).
- G. Schedule Updating: Concurrent with making revisions to schedule, prepare tabulated reports showing the following:
 1. Identification of activities that have changed.
 2. Changes in early and late start dates.
 3. Changes in early and late finish dates.
 4. Changes in activity durations in workdays.
 5. Changes in the critical path.
 6. Changes in total float or slack time.
 7. Changes in the Contract Time.
- H. Value Summaries: Prepare two cumulative value lists, sorted by finish dates.
 1. In first list, tabulate activity number, early finish date, dollar value and cumulative dollar value.
 2. In second list, tabulate activity number, late finish date, dollar value and cumulative dollar value.
 3. In subsequent issues of both lists, substitute actual finish dates for activities completed as of list date.

4. Prepare list for ease of comparison with payment requests; coordinate timing with progress meetings.
 - a. In both value summary lists, tabulate "actual percent complete" and "cumulative value completed" with total at bottom.
 - b. Submit value summary printouts one week before each regularly scheduled progress meeting.

1.12 REPORTS

- A. Daily Construction Reports: Prepare a daily construction report recording the following information concerning events at Project site:
 1. List of Subcontractors at Project site.
 2. List of separate Contractors at Project site.
 3. Approximate count of personnel at Project site.
 4. Equipment at Project site.
 5. Material deliveries.
 6. High and low temperatures and general weather conditions, including presence of rain or snow.
 7. Testing and inspection.
 8. Accidents.
 9. Meetings and significant decisions.
 10. Unusual events.
 11. Stoppages, delays, shortages and losses.
 12. Meter readings and similar recordings.
 13. Emergency procedures.
 14. Orders and requests of authorities having jurisdiction.
 15. Change Orders received and implemented.
 16. Construction Change Directives received and implemented.
 17. Services connected and disconnected.
 18. Equipment or system tests and startups.
 19. Partial completions and occupancies.
 20. Substantial Completions authorized.
- B. Material Location Reports: At monthly intervals, prepare and submit a comprehensive list of materials delivered to and stored at Project site. List shall be cumulative, showing materials previously reported plus items recently delivered. Include with list a statement of progress on and delivery dates for materials or items of equipment fabricated or stored away from Project site. Indicate the following categories for stored materials:
 1. Material stored prior to previous report and remaining in storage.
 2. Material stored prior to previous report and since removed from storage and installed.
 3. Material stored following previous report and remaining in storage.
- C. Site Condition Reports: Immediately on discovery of a difference between site conditions and the Contract Documents, prepare and submit a detailed report. Submit

with a Request for Information. Include a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.

- D. Unusual Event Reports: When an event of an unusual and significant nature occurs at Project site, whether or not related directly to the work, prepare and submit a special report. List chain of events, persons participating, and responses by Contractors personnel, evaluation of results or effects and similar pertinent information. Advise Owner in advance when these events are known or predictable.

1. Submit unusual event reports directly to Owner within one-day of an occurrence. Distribute copies of report to parties affected by the occurrence.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 013200

SECTION 013233 - PHOTOGRAPHIC DOCUMENTATION PART

1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for the following:
 - 1. Periodic construction photographs.
 - 2. Final completion construction photographs.
- B. Related Requirements:
 - 1. Section 017700 "Closeout Procedures" for submitting photographic documentation as Project Record Documents at Project closeout.
 - 2. Section 017900 "Demonstration and Training" for submitting video recordings of demonstration of equipment and training of Owners personnel.

1.3 INFORMATIONAL SUBMITTALS

- A. Key Plan: Submit key plan of Project site and building with notation of vantage points marked for location and direction of each photograph. Indicate elevation or story of construction. Include same information as corresponding photographic documentation.
- B. Digital Photographs: Submit image files within three-days of taking photographs.
 - 1. Submit photos on thumb-drive. Include copy of key plan indicating each photographs location and direction.
 - 2. Identification: Provide the following information with each image description in web-based project software site:
 - a. Name of Project.
 - b. Name and contact information for photographer.
 - c. Name of Architect.
 - d. Name of Contractor.
 - e. Date photograph was taken.
 - f. Description of location, vantage point and direction.
 - g. Unique sequential identifier keyed to accompanying key plan.
 - h.

- C. Printed Photographs: Submit two sets of prints of each photographic view within seven-days of taking photographs.
 - 1. Format: 8-inch by-10-inch smooth-surface matte prints on single-weight, paper; enclosed back to back in clear plastic sleeves punched for three-ring binder. Include copy of key plan indicating each photographs location and direction. Provide one binder for each set of prints.
 - 2. Identification: On back of each print, label with the following information:
 - a. Name of Project.
 - b. Name and contact information for photographer.
 - c. Name of Architect.
 - d. Name of Contractor.
 - e. Date photograph was taken if not date stamped by camera.
 - f. Description of vantage point, indicating location, direction and elevation or story of construction.
 - g. Unique sequential identifier keyed to accompanying key plan.

1.4 FORMATS AND MEDIA

- A. Digital Photographs: Provide color images in JPG format, produced by a digital camera with minimum sensor size of 12 megapixels and at an image resolution of not less than 3200 by 2400 pixels and with vibration-reduction technology. Use flash in low light levels or backlit conditions.
- B. Digital Images: Submit digital media as originally recorded in the digital camera, without alteration, manipulation, editing or modifications using image-editing software.
- C. Metadata: Record accurate date and time from camera.
- D. File Names: Name media files with date and sequential numbering suffix.

CONSTRUCTION PHOTOGRAPHS

- A. General: Take photographs with maximum depth of field and in focus.
 - 1. Maintain key plan with each set of construction photographs that identifies each photographic location.
- B. Pre-Construction Photographs: Take full set of pre-construction photos documenting all existing conditions, to determine if construction activities have damaged roads, curbs, structures, etc.
- C. Periodic Construction Photographs: Take 20-photographs weekly coinciding with the cutoff date associated with each Application for Payment. Select vantage points to show status of construction and progress since last photographs were taken.
- D. Time-Lapse Sequence Construction Photographs: Take 20-photographs as indicated, to show status of construction and progress since last photographs were taken.

1. Frequency: Take photographs weekly, on the same day each week.
 2. Vantage Points: Contractor to select vantage points. During each of the following construction phases, take not less than two of the required shots from same vantage point each time to create a time-lapse sequence as follows:
 - a. Commencement of the work, through completion of subgrade construction.
 - b. Above-grade structural framing.
 - c. Exterior building enclosure.
 - d. Interior work, through date of Substantial Completion.
- E. Final Completion Construction Photographs: Take 50-photographs after date of Substantial Completion for submission as Project Record Documents. Contractor will inform photographer of desired vantage points.

PART 2 - EXECUTION (Not Used)

END OF SECTION 013233

SECTION 013300 - SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this section.

1.2 SUMMARY

- A. Section Includes:

- 1. Submittal schedule requirements.
 - 2. Administrative and procedural requirements for submittals.

- B. Related Requirements:

- 1. Section 012900 "Payment Procedures" for submitting Applications for Payment and the schedule of values.
 - 2. Section 013100 "Project Management and Coordination" for submitting coordination drawings and subcontract list and for requirements for web-based project software.
 - 3. Section 013200 "Construction Progress Documentation" for submitting schedules and reports, including Contractors construction schedule.
 - 4. Section 013233 "Photographic Documentation" for submitting preconstruction photographs, periodic construction photographs and final completion construction photographs.
 - 5. Section 014000 "Quality Requirements" for submitting test and inspection reports and schedule of tests and inspections.
 - 6. Section 017700 "Closeout Procedures" for submitting closeout submittals and maintenance material submittals.
 - 7. Section 017823 "Operation and Maintenance Data" for submitting operation and maintenance manuals.
 - 8. Section 017839 "Project Record Documents" for submitting record drawings, record specifications and record product data.
 - 9. Section 017900 "Demonstration and Training" for submitting video recordings of demonstration of equipment and training of Owners personnel.
 - 10. Divisions 2 through 26 sections for specific requirements for submittals in those sections.

1.3 DEFINITIONS

- A. Action Submittals: Written and graphic information and physical samples that require Architects responsive action. Action submittals are those submittals indicated in individual specification sections as "action submittals."
- B. Informational Submittals: Written and graphic information and physical samples that do not require Architects responsive action. Submittals may be rejected for not complying with requirements. Informational submittals are those submittals indicated in individual specification sections as "informational submittals."

1.4 SUBMITTAL SCHEDULE

- A. Submittal Schedule: Submit, as an action submittal, a list of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review ordering, manufacturing, fabrication and delivery when establishing dates. Include additional time required for making corrections or revisions to submittals noted by Architect and additional time for handling and reviewing submittals required by those corrections.
 - 1. Coordinate submittal schedule with list of subcontracts, the schedule of values and Contractors construction schedule.
 - 2. Initial Submittal: Submit concurrently with startup construction schedule. Include submittals required during the first 60-days of construction. List those submittals required to maintain orderly progress of the work and those required early because of long lead time for manufacture or fabrication.
 - 3. Final Submittal: Submit concurrently with the first complete submittal of Contractors construction schedule.
 - a. Submit revised submittal schedule to reflect changes in current status and timing for submittals.
 - 4. Format: Arrange the following information in a tabular format:
 - a. Scheduled date for first submittal.
 - b. Specification section number and title.
 - c. Submittal Category: Action; informational.
 - d. Name of Subcontractors.
 - e. Description of the work covered.
 - f. Scheduled date for Architects final release or approval.
 - g. Scheduled dates for purchasing.
 - h. Scheduled date of fabrication.
 - i. Scheduled dates for installation.
 - j. Activity or event number.

1.5 SUBMITTAL FORMATS

A. Submittal Information: Include the following information in each submittal:

1. Project name.
2. Date.
3. Name of Architect.
4. Name of Contractor.
5. Name of firm or entity that prepared submittal.
6. Names of subcontractors, manufacturers and suppliers.
7. Unique submittal number, including revision identifier. Include specification section number with sequential alphanumeric identifier and alphanumeric suffix for resubmittals.
8. Category and type of submittal.
9. Submittal purpose and description.
10. Number and title of specification section, with paragraph number and generic name for each of multiple items.
11. Drawing number and detail references, as appropriate.
12. Indication of full or partial submittal.
13. Location(s) where product is to be installed, as appropriate.
14. Other necessary identification.
15. Remarks.
16. Signature of transmitter.

B. Options: Identify options requiring selection by Architect.

C. Deviations and Additional Information: On each submittal, clearly indicate deviations from requirements in the Contract Documents, including minor variations and limitations; include relevant additional information and revisions, other than those requested by Architect on previous submittals. Indicate by highlighting on each submittal or noting on attached separate sheet.

D. Paper Submittals:

1. Place a permanent label or title block on each submittal item for identification; include name of firm or entity that prepared submittal.
2. Provide a space approximately 6-inches by 8-inches on label or beside title block to record Contractors review and approval markings and action taken by Architect. All submittals are to be reviewed by the Contractor prior to submittal to the Architect and signed on the cover sheet.
3. Action Submittals: Submit three paper copies of each submittal unless otherwise indicated. Architect will return two copies.
4. Informational Submittals: Submit two paper copies of each submittal unless otherwise indicated. Architect will not return copies.
5. Additional Copies: Unless additional copies are required for final submittal and unless Architect observes non-compliance with provisions in the Contract Documents, initial submittal may serve as final submittal.
6. Transmittal for Submittals: Assemble each submittal individually and appropriately for transmittal and handling.

- E. PDF Submittals: Prepare submittals as PDF package, incorporating complete information into each PDF file. Name PDF file with submittal number.

1.6 SUBMITTAL PROCEDURES

- A. Coordination: Coordinate preparation and processing of submittals with performance of Construction activities.
 - 1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals and related activities that require sequential activity.
 - 2. Coordinate transmittal of different types of submittals for related parts of the work so processing will not be delayed because of need to review submittals concurrently for coordination.
 - a. Architect reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.
 - 1) Interior colors (all color submittals to be received at one time before any selections are made).
 - 2) Exterior colors (all color submittals to be received at one time before any selections are made).
 - 3) Doors and door hardware (both submittals to be received before review will begin).
 - 4) Other related submittals as determined by the Architect.
- B. Submittal tracking system shall be via electronic submission such as email or owner or architect administrated software system.
- C. Prepare and submit submittals required by individual specification sections. Types of submittals are indicated in individual specification sections.
 - 1. Email: Prepare submittals as PDF package and transmit to Architect by sending via email. Include PDF transmittal form. Include information in email subject line as requested by Architect.
 - a. Architect will return annotated file. Annotate and retain one copy of file as a digital Project Record Document file.
 - 2. Paper: Prepare submittals in paper form and deliver to Architect.
- D. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.
 - 1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals and related activities that require sequential activity.
 - 2. Submit all submittal items required for each specification section concurrently unless partial submittals for portions of the work are indicated on approved submittal schedule.
 - 3. Submit action submittals and informational submittals required by the same specification section as separate packages under separate transmittals.

4. Coordinate transmittal of submittals for related parts of the work specified in different sections so processing will not be delayed because of need to review submittals concurrently for coordination.
- E. Processing Time: Allow time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Architects receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the work to permit processing, including resubmittals.
1. Initial Review: Allow 10 working days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Architect will advise Contractor when a submittal being processed must be delayed for coordination.
 2. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.
 3. Resubmittal Review: Allow 10 working days for review of each resubmittal.
 4. Sequential Review: Where sequential review of submittals by Architects consultants, Owner or other parties is required, allow 20 working days for initial review of each submittal.
 5. Concurrent Consultant Review: Where the Contract Documents indicate that submittals may be transmitted simultaneously to Architect and to Architects Consultants, allow 15-working days for review of each submittal. Submittal will be returned to Architect before being returned to Contractor.
 - a. Submit one copy of submittal to concurrent reviewer in addition to specified number of copies to Architect.
- F. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.
1. Note date and content of previous submittal.
 2. Note date and content of revision in label or title block and clearly indicate extent of revision.
 3. Resubmit submittals until they are marked with approval notation from Architects action stamp.
- G. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction and others as necessary for performance of construction activities. Show distribution on transmittal forms.
- H. Use for Construction: Retain complete copies of submittals on Project site. Use only final action submittals that are marked with approval notation from Architects action stamp.

1.7 SUBMITTAL REQUIREMENTS

- A. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.

1. If information must be specially prepared for submittal because standard published data are unsuitable for use, submit as shop drawings not as product data.
 2. Mark each copy of each submittal to show which products and options are applicable.
 3. Include the following information as applicable:
 - a. Manufacturers catalog cuts.
 - b. Manufacturers product specifications.
 - c. Standard color charts.
 - d. Statement of compliance with specified referenced standards.
 - e. Testing by recognized testing agency.
 - f. Application of testing agency labels and seals.
 - g. Notation of coordination requirements.
 - h. Availability and delivery time information.
 4. For equipment include the following in addition to the above as applicable:
 - a. Wiring diagrams that show factory-installed wiring.
 - b. Printed performance curves.
 - c. Operational range diagrams.
 - d. Clearances required to other construction if not indicated on accompanying shop drawings.
 5. Submit product data before shop drawings and before or concurrent with samples.
- B. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base shop drawings on reproductions of the Contract Documents or standard printed data.
1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information as applicable:
 - a. Dimensions.
 - b. Identification of products.
 - c. Fabrication and installation drawings.
 - d. Roughing-in and setting diagrams.
 - e. Wiring diagrams showing field-installed wiring, including power, signal and control wiring.
 - f. Shop work manufacturing instructions.
 - g. Templates and patterns.
 - h. Schedules.
 - i. Design calculations.
 - j. Compliance with specified standards.
 - k. Notation of coordination requirements.
 - l. Notation of dimensions established by field measurement.
 - m. Relationship to adjoining construction clearly indicated.
 - n. Wiring Diagrams: Differentiate between manufacturer-installed and field-installed wiring.

1. Sheet Size: Except for templates, patterns and similar full-size drawings, submit shop drawings on sheets at least 8-1/2-inches x 11-inches but no larger than 24-inches x 36-inches.
 2. Number of Copies: Submit seven copies of each submittal. Architect will retain 2 copies; remainder will be returned. Mark up and retain one returned copy as a Project Record Drawing.
- C. Samples: Submit samples for review of kind, color, pattern and texture for a check of these characteristics with other materials.
1. Transmit samples that contain multiple, related components such as accessories together in one submittal package.
 2. Identification: Permanently attach label on unexposed side of samples that includes the following:
 - a. Project name and submittal number.
 - b. Generic description of sample.
 - c. Product name and name of manufacturer.
 - d. Sample source.
 - e. Number and title of applicable specification section.
 - f. Specification paragraph number and generic name of each item.
 3. Email Transmittal: Provide PDF transmittal. Include digital image file illustrating Sample characteristics and identification information for record.
 4. Paper Transmittal: Include paper transmittal including complete submittal information indicated.
 5. Disposition: Maintain sets of approved samples at Project site, available for quality-control comparisons throughout the course of construction activity. sample sets may be used to determine final acceptance of construction associated with each set.
 - a. Samples that may be incorporated into the work are indicated in individual specification sections. Such samples must be in an undamaged condition at time of use.
 - b. Samples not incorporated into the work or otherwise designated as Owners property, are the property of Contractor.
 6. Samples for Initial Selection: Submit manufacturers color charts consisting of units or sections of units showing the full range of colors, textures and patterns available.
 - a. Number of Samples: Submit two full sets of available choices where color, pattern, texture or similar characteristics are required to be selected from manufacturers product line. Architect will return submittal with options selected.
 7. Samples for Verification: Submit full-size units or samples of size indicated, prepared from same material to be used for the work, cured and finished in manner specified and physically identical with material or product proposed for use and that show full range of color and texture variations expected. Samples include but are not limited to the following: partial sections of manufactured or

fabricated components; small cuts or containers of materials; complete units of repetitively used materials; swatches showing color, texture and pattern; color range sets; and components used for independent testing and inspection.

- a. Number of Samples: Submit three sets of samples. Architect will retain two sample sets; remainder will be returned.
 - 1) Submit a single sample where assembly details, workmanship, fabrication techniques, connections, operation and other similar characteristics are to be demonstrated.
 - 2) If variation in color, pattern, texture or other characteristic is inherent in material or product represented by a sample, submit at least three sets of paired units that show approximate limits of variations.
- D. Product Schedule: As required in individual specification sections, prepare a written summary indicating types of products required for the work and their intended location. Include the following information in tabular form:
 1. Type of product. Include unique identifier for each product indicated in the Contract Documents or assigned by Contractor if none is indicated.
 2. Manufacturer and product name and model number if applicable.
 3. Number and name of room or space.
 4. Location within room or space.
- E. Submittals Schedule: Comply with requirements specified in Division 1 Section "Construction Progress Documentation."
- F. Application for Payment: Comply with requirements specified in Division 1 Section "Payment Procedures."
- G. Schedule of Values: Comply with requirements specified in Division 1 Section "Payment Procedures."
- H. Subcontractor List: Prepare a written summary identifying individuals or firms proposed for each portion of the work, including those who are to furnish products or equipment fabricated to a special design. Include the following information in tabular form:
 1. Name, address and telephone number of entity performing subcontractor supplying products.
 2. Number and title of related specification section(s) covered by subcontract.
 3. Drawing number and detail references, as appropriate, covered by subcontract.
 4. Number of Copies: Submit three-copies of subcontractors list, unless otherwise indicated. Architect will return two-copies.
 - a. Mark up and retain one returned copy as a project record document.
- I. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, contact information of architects and owners and other information specified.

- J. Design Data: Prepare and submit written and graphic information indicating compliance with indicated performance and design criteria in individual specification sections. Include list of assumptions and summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Number each page of submittal.
- K. Certificates:
1. Certificates and Certifications Submittals: Submit a statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity. Provide a notarized signature where indicated.
 2. Installer Certificates: Submit written statements on manufacturers letterhead certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.
 3. Manufacturer Certificates: Submit written statements on manufacturers letterhead certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.
 4. Material Certificates: Submit written statements on manufacturers letterhead certifying that material complies with requirements in the Contract Documents.
 5. Product Certificates: Submit written statements on manufacturers letterhead certifying that product complies with requirements in the Contract Documents.
 6. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements in the Contract Documents. Submit record of Welding Procedure Specification and Procedure Qualification Record on AWS forms. Include names of firms and personnel certified.
- L. Test and Research Reports:
1. Compatibility Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for primers and substrate preparation needed for adhesion.
 2. Field Test Reports: Submit written reports indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements in the Contract Documents.
 3. Material Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements in the Contract Documents.
 4. Preconstruction Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements in the Contract Documents.
 5. Product Test Reports: Submit written reports indicating that current product produced by manufacturer complies with requirements in the Contract Documents. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency or on comprehensive tests performed by a qualified testing agency.

6. Research Reports: Submit written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project. Include the following information:
 - a. Name of evaluation organization.
 - b. Date of evaluation.
 - c. Time period when report is in effect.
 - d. Product and manufacturers names.
 - e. Description of product.
 - f. Test procedures and results.
 - g. Limitations of use.

1.8 DELEGATED-DESIGN SERVICES

- A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.
 1. If criteria indicated are insufficient to perform services or certification required, submit a written request for additional information to Architect.
- B. Delegated-Design Services Certification: In addition to shop drawings, product data and other required submittals, submit digitally signed PDF file and three paper copies of certificate, signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional.
 1. Indicate that products and systems comply with performance and design criteria in the Contract Documents. Include list of codes, loads and other factors used in performing these services.

1.9 CONTRACTORS REVIEW

- A. Action Submittals and Informational Submittals: Review each submittal and check for coordination with other work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Architect.
- B. Contractors Approval: Indicate Contractors approval for each submittal with a uniform approval stamp Include name of reviewer, date of Contractors approval and statement certifying that submittal has been reviewed, checked and approved for compliance with the Contract Documents.
 1. Architect will not review submittals received from Contractor that do not have Contractors review and approval.

1.10 ARCHITECT REVIEW

- A. Action Submittals: Architect will review each submittal, indicate corrections or revisions required.
 - 1. PDF Submittals: Architect will indicate, via markup on each submittal, the appropriate action as follows:
 - a. Disapprove, Correct and Resubmit
 - b. Approved as Corrected (Submit Corrected File Copy)
 - c. Approved
 - 2. Paper Submittals: Architect will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action as follows:
 - a. Disapprove, Correct and Resubmit
 - b. Approved as Corrected (Submit Corrected File Copy)
 - c. Approved
- B. Informational Submittals: Architect will review each submittal and will not return it or will return it if it does not comply with requirements. Architect will forward each submittal to appropriate party.
- C. Partial submittals prepared for a portion of the work will be reviewed when use of partial submittals has received prior approval from Architect.
- D. Incomplete submittals are unacceptable, will be considered non-responsive and will be returned for resubmittal without review.
- E. Architect will return without review submittals received from sources other than Contractor.
- F. Submittals not required by the Contract Documents will be returned by Architect without action.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 013300

SECTION 014000 - QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for quality assurance and quality control.
- B. Testing and inspection services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.
 - 1. Specific quality-assurance and quality-control requirements for individual work results are specified in their respective specification sections. Requirements in individual sections may also cover production of standard products.
 - 2. Specified tests, inspections and related actions do not limit Contractors other quality-assurance and quality-control procedures that facilitate compliance with the Contract Document requirements.
 - 3. Requirements for Contractor to provide quality-assurance and quality-control services required by Architect, Owner or authorities having jurisdiction are not limited by provisions of this section.
 - 4. Specific test and inspection requirements are not specified in this section.
- C. Related sections include the following:
 - 1. Section 017300 "Execution" for cutting, patching, repair and restoration of construction disturbed by testing and inspecting activities.
 - 2. Statement of Special Inspections, located at the end of this section.
 - 3. Divisions 2 through 26 sections for specific requirements for submittals in those sections.

1.3 DEFINITIONS

- A. Experienced: When used with an entity or individual, "experienced" unless otherwise further described means having successfully completed a minimum of five previous projects similar in nature, size and extent to this Project; being familiar with special requirements indicated and having complied with requirements of authorities having jurisdiction.

- B. Field Quality-Control Tests: Tests and inspections that are performed on-site for installation of the work and for completed work.
- C. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, Subcontractor or Sub-subcontractor, to perform a particular construction operation, including installation, erection, application, assembly and similar operations.
 - 1. Use of trade-specific terminology in referring to a trade or entity does not require that certain construction activities be performed by accredited or unionized individuals or that requirements specified apply exclusively to specific trade(s).
- D. Mockups: Full-size physical assemblies that are constructed on-site either as freestanding temporary built elements or as part of permanent construction. Mockups are constructed to verify selections made under sample submittals; to demonstrate aesthetic effects and qualities of materials and execution; to review coordination, testing or operation; to show interface between dissimilar materials; and to demonstrate compliance with specified installation tolerances. Mockups are not samples. Unless otherwise indicated, approved mockups establish the standard by which the work will be judged.
 - 1. Laboratory Mockups: Full-size physical assemblies constructed and tested at testing facility to verify performance characteristics.
 - 2. Integrated Exterior Mockups: Mockups of the exterior envelope constructed on-site as freestanding temporary built elements or as part of permanent construction, consisting of multiple products, assemblies and subassemblies. See required configuration at the end of this section.
- E. Pre-construction Testing: Tests and inspections performed specifically for Project before products and materials are incorporated into the work, to verify performance or compliance with specified criteria.
- F. Product Tests: Tests and inspections that are performed by a nationally recognized testing laboratory (NRTL) according to 29 CFR 1910.7, by a testing agency accredited according to NIST's National Voluntary Laboratory Accreditation Program (NVLAP) or by a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with specified requirements.
- G. Source Quality-Control Tests: Tests and inspections that are performed at the source; for example, plant, mill, factory or shop.
- H. Testing Agency: An entity engaged to perform specific tests, inspections or both. Testing laboratory shall mean the same as testing agency.
- I. Quality-Assurance Services: Activities, actions and procedures performed before and during execution of the work to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.
- J. Quality-Control Services: Tests, inspections, procedures and related actions during and after execution of the work to evaluate that actual products incorporated into the

work and completed construction comply with requirements. Contractors quality-control services do not include contract administration activities performed by Architect.

1.4 DELEGATED-DESIGN SERVICES

- A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.
 - 1. If criteria indicated are not sufficient to perform services or certification required, submit a written request for additional information to Architect.

1.5 CONFLICTING REQUIREMENTS

- A. Conflicting Standards and Other Requirements: If compliance with two or more standards or requirements are specified and the standards or requirements establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer conflicting requirements that are different, but apparently equal, to Architect for direction before proceeding.
- B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Architect for a decision before proceeding.

1.6 ACTION SUBMITTALS

- A. Shop Drawings: For integrated exterior mockups.
 - 1. Include plans, sections and elevations, indicating materials and size of mockup construction.
 - 2. Indicate manufacturer and model number of individual components.
 - 3. Provide axonometric drawings for conditions difficult to illustrate in two dimensions.
- B. Delegated-Design Services Submittal: In addition to shop drawings, product data and other required submittals, submit a statement signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional, indicating that the products and systems are in compliance with performance and design criteria indicated. Include list of codes, loads and other factors used in performing these services.

1.7 INFORMATIONAL SUBMITTALS

- A. Contractors Quality-Control Plan: For quality-assurance and quality-control activities and responsibilities.
- B. Qualification Data: For Contractors quality-control personnel.
- C. Contractors Statement of Responsibility: When required by authorities having jurisdiction, submit copy of written statement of responsibility submitted to authorities having jurisdiction before starting work on the following systems:
 - 1. Seismic-force-resisting system, designated seismic system or component listed in the Statement of Special Inspections.
 - 2. Main wind-force-resisting system or a wind-resisting component listed in the Statement of Special Inspections.
- D. Testing Agency Qualifications: For testing agencies specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include proof of qualifications in the form of a recent report on the inspection of the testing agency by a recognized authority.
- E. Schedule of Tests and Inspections: Prepare in tabular form and include the following:
 - 1. Specification section number and title.
 - 2. Entity responsible for performing tests and inspections.
 - 3. Description of test and inspection.
 - 4. Identification of applicable standards.
 - 5. Identification of test and inspection methods.
 - 6. Number of tests and inspections required.
 - 7. Time schedule or time span for tests and inspections.
 - 8. Requirements for obtaining samples.
 - 9. Unique characteristics of each quality-control service.
- F. Reports: Prepare and submit certified written reports and documents as specified.
- G. Permits, Licenses and Certificates: For Owners record, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records and similar documents established for compliance with standards and regulations bearing on performance of the work.

1.8 CONTRACTORS QUALITY-CONTROL PLAN

- A. Quality-Control Plan, General: Submit quality-control plan within ten-days of Notice to Proceed and not less than five-days prior to pre-construction conference. Submit in format acceptable to Architect. Identify personnel, procedures, controls, instructions, tests, records and forms to be used to carry out Contractors quality-assurance and quality-control responsibilities. Coordinate with Contractors Construction Schedule.

- B. Quality-Control Personnel Qualifications: Engage qualified personnel trained and experienced in managing and executing quality-assurance and quality-control procedures similar in nature and extent to those required for Project.
 - 1. Project quality-control manager may also serve as Project superintendent.
- C. Submittal Procedure: Describe procedures for ensuring compliance with requirements through review and management of submittal process. Indicate qualifications of personnel responsible for submittal review.
- D. Testing and Inspection: In quality-control plan, include a comprehensive schedule of work requiring testing or inspection, including the following:
 - 1. Contractor performed tests and inspections including subcontractor performed tests and inspections. Include required tests and inspections and Contractor elected tests and inspections. Distinguish source quality-control tests and inspections from field quality-control tests and inspections.
 - 2. Special inspections required by authorities having jurisdiction and indicated on the Statement of Special Inspections.
 - 3. Owner-performed tests and inspections indicated in the Contract Documents, including tests and inspections indicated to be performed by Commissioning Authority.
- E. Continuous Inspection of Workmanship: Describe process for continuous inspection during construction to identify and correct deficiencies in workmanship in addition to testing and inspection specified. Indicate types of corrective actions to be required to bring work into compliance with standards of workmanship established by Contract requirements and approved mockups.
- F. Monitoring and Documentation: Maintain testing and inspection reports including log of approved and rejected results. Include work Architect has indicated as non-conforming or defective. Indicate corrective actions taken to bring nonconforming work into compliance with requirements. Comply with requirements of authorities having jurisdiction.

1.9 REPORTS AND DOCUMENTS

- A. Test and Inspection Reports: Prepare and submit certified written reports specified in other sections. Include the following:
 - 1. Date of issue.
 - 2. Project title and number.
 - 3. Name, address, telephone number and email address of testing agency.
 - 4. Dates and locations of samples and tests or inspections.
 - 5. Names of individuals making tests and inspections.
 - 6. Description of the work and test and inspection method.
 - 7. Identification of product and specification section.
 - 8. Complete test or inspection data.
 - 9. Test and inspection results and an interpretation of test results.

10. Record of temperature and weather conditions at time of sample taking and testing and inspection.
 11. Comments or professional opinion on whether tested or inspected work complies with the Contract Document requirements.
 12. Name and signature of laboratory inspector.
 13. Recommendations on retesting and reinspecting.
- B. Manufacturers Technical Representatives Field Reports: Prepare written information documenting manufacturers technical representatives tests and inspections specified in other sections. Include the following:
1. Name, address, telephone number and email address of technical representative making report.
 2. Statement on condition of substrates and their acceptability for installation of product.
 3. Statement that products at Project site comply with requirements.
 4. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
 5. Results of operational and other tests and a statement of whether observed performance complies with requirements.
 6. Statement whether conditions, products and installation will affect warranty.
 7. Other required items indicated in individual specification sections.
- C. Factory-Authorized Service Representatives Reports: Prepare written information documenting manufacturers factory-authorized service representatives tests and inspections specified in other Sections. Include the following:
1. Name, address, telephone number and email address of factory-authorized service representative making report.
 2. Statement that equipment complies with requirements.
 3. Results of operational and other tests and a statement of whether observed performance complies with requirements.
 4. Statement whether conditions, products and installation will affect warranty.
 5. Other required items indicated in individual specification sections.

1.10 QUALITY ASSURANCE

- A. General: Qualifications paragraphs in this article establish the minimum qualification levels required; individual specification sections specify additional requirements.
- B. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units. As applicable, procure products from manufacturers able to meet qualification requirements, warranty requirements and technical or factory-authorized service representative requirements.
- C. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

- D. Installer Qualifications: A firm or individual experienced in installing, erecting, applying or assembling work similar in material, design and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.
- E. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly or product that are similar in material, design and extent to those indicated for this Project.
- F. Specialists: Certain specification sections require that specific construction activities shall be performed by entities who are recognized experts in those operations. Specialists shall satisfy qualification requirements indicated and shall be engaged for the activities indicated.
 - 1. Requirements of authorities having jurisdiction shall supersede requirements for specialists.
- G. Testing Agency Qualifications: An NRTL, an NVLAP or an independent agency with the experience and capability to conduct testing and inspection indicated, as documented according to ASTM E 329 and with additional qualifications specified in individual sections and, where required by authorities having jurisdiction, that is acceptable to authorities.
- H. Manufacturers Technical Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to observe and inspect installation of manufacturers products that are similar in material, design and extent to those indicated for this Project.
- I. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect installation of manufacturers products that are similar in material, design and extent to those indicated for this Project.
- J. Pre-construction Testing: Where testing agency is indicated to perform preconstruction testing for compliance with specified requirements for performance and test methods, comply with the following:
 - 1. Contractor responsibilities include the following:
 - a. Provide test specimens representative of proposed products and construction.
 - b. Submit specimens in a timely manner with sufficient time for testing and analyzing results to prevent delaying the work.
 - c. Provide sizes and configurations of test assemblies, mockups and laboratory mockups to adequately demonstrate capability of products to comply with performance requirements.
 - d. Build site-assembled test assemblies and mockups using installers who will perform same tasks for Project.

- e. Build laboratory mockups at testing facility using personnel, products and methods of construction indicated for the completed work.
 - f. When testing is complete, remove test specimens and test assemblies, mockups and laboratory mockups; do not reuse products on Project.
- K. Testing Agency Responsibilities: Cooperate with Architect and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.
 - 1. Notify Architect and Contractor promptly of irregularities or deficiencies observed in the work during performance of its services.
 - 2. Determine the location from which test samples will be taken and in which in-situations tests are conducted.
 - 3. Conduct and interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.
 - 4. Submit a certified written report, in duplicate, of each test, inspection and similar quality-control service through Contractor.
 - 5. Do not release, revoke, alter or increase the Contract Document requirements or approve or accept any portion of the work.
 - 6. Do not perform any duties of Contractor.
- L. Mockups: Before installing portions of the work requiring mockups, build mockups for each form of construction and finish required to comply with the following requirements, using materials indicated for the completed work:
 - 1. Build mockups of size indicated.
 - 2. Build mockups in location indicated or, if not indicated, as directed by Architect.
 - 3. Notify Architect seven-days in advance of dates and times when mockups will be constructed.
 - 4. Employ supervisory personnel who will oversee mockup construction. Employ workers that will be employed to perform same tasks during the construction at Project.
 - 5. Demonstrate the proposed range of aesthetic effects and workmanship.
 - 6. Obtain Architects approval of mockups before starting corresponding work, fabrication or construction.
 - a. Allow seven-days for initial review and each re-review of each mockup.
 - 7. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed work.
 - 8. Demolish and remove mockups when directed unless otherwise indicated.
- M. Integrated Exterior Mockups: Construct integrated exterior wall mockup according to approved shop drawings. Coordinate installation of exterior envelope materials and products for which mockups are required in individual specification sections, along with supporting materials. Comply with requirements in "Mockups" paragraph. See exterior wall mock up at the end of this section.
- N. Provide room mockups of the following:
 - 1. As identified in the individual specification sections

1.11 QUALITY CONTROL

- A. Owner Responsibilities: Where quality-control services are indicated as Owners responsibility, Owner will engage a qualified testing agency to perform these services.
 - 1. Owner will furnish Contractor with names, addresses and telephone numbers of testing agencies engaged and a description of types of testing and inspection they are engaged to perform.
 - 2. Costs for retesting and reinspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to Contractor.
- B. Contractor Responsibilities: Tests and inspections not explicitly assigned to Owner are Contractors responsibility. Perform additional quality-control activities, whether specified or not, to verify and document that the work complies with requirements.
 - 1. Unless otherwise indicated, provide quality-control services specified and those required by authorities having jurisdiction. Perform quality-control services required of Contractor by authorities having jurisdiction, whether specified or not.
 - 2. Engage a qualified testing agency to perform quality-control services.
 - a. Contractor shall not employ same entity engaged by Owner, unless agreed to in writing by Owner.
 - 3. Notify testing agencies at least 24-hours in advance of time when work that requires testing or inspection will be performed.
 - 4. Where quality-control services are indicated as Contractors responsibility, submit a certified written report, in duplicate, of each quality-control service.
 - 5. Testing and inspection requested by Contractor and not required by the Contract Documents are Contractors responsibility.
 - 6. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.
- C. Retesting/Reinspecting: Regardless of whether original tests or inspections were Contractors responsibility, provide quality-control services, including retesting and reinspecting, for construction that replaced work that failed to comply with the Contract Documents.
- D. Testing Agency Responsibilities: Cooperate with Architect and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.
 - 1. Notify Architect and Contractor promptly of irregularities or deficiencies observed in the work during performance of its services.
 - 2. Determine the locations from which test samples will be taken and in which in-situ tests are conducted.
 - 3. Conduct and interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.
 - 4. Submit a certified written report, in duplicate, of each test, inspection and similar quality-control service through Contractor.

5. Do not release, revoke, alter or increase the Contract Document requirements or approve or accept any portion of the work.
 6. Do not perform duties of Contractor.
- E. Manufacturers Field Services: Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing as specified in Section 01 33 00 "Submittal Procedures."
- F. Manufacturers Technical Services: Where indicated, engage a manufacturers technical representative to observe and inspect the work. Manufacturers technical representatives services include participation in preinstallation conferences, examination of substrates and conditions, verification of materials, observation of Installer activities, inspection of completed portions of the work and submittal of written reports.
- G. Associated Contractor Services: Cooperate with agencies and representatives performing required tests, inspections and similar quality-control services and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:
1. Access to the work.
 2. Incidental labor and facilities necessary to facilitate tests and inspections.
 3. Adequate quantities of representative samples of materials that require testing and inspection. Assist agency in obtaining samples.
 4. Facilities for storage and field curing of test samples.
 5. Delivery of samples to testing agencies.
 6. Preliminary design mix proposed for use for material mixes that require control by testing agency.
 7. Security and protection for samples and for testing and inspection equipment at Project site.
- H. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and quality-control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspection.
1. Schedule times for tests, inspections, obtaining samples and similar activities.
- I. Schedule of Tests and Inspections: Prepare a schedule of tests, inspections and similar quality-control services required by the Contract Documents as a component of Contractors quality-control plan. Coordinate and submit concurrently with Contractors Construction Schedule. Update as the work progresses.
1. Distribution: Distribute schedule to Owner, Architect, testing agencies and each party involved in performance of portions of the work where tests and inspections are required.

1.12 SPECIAL TESTS AND INSPECTIONS

- A. Special Tests and Inspections: Owner will engage a qualified special inspector to conduct special tests and inspections required by authorities having jurisdiction as the responsibility of Owner and as follows:
 - 1. Verifying that manufacturer maintains detailed fabrication and quality-control procedures and reviewing the completeness and adequacy of those procedures to perform the work.
 - 2. Notifying Architect and Contractor promptly of irregularities and deficiencies observed in the work during performance of its services.
 - 3. Submitting a certified written report of each test, inspection and similar quality-control service to Architect with copy to Contractor and to authorities having jurisdiction.
 - 4. Submitting a final report of special tests and inspections at Substantial Completion, which includes a list of unresolved deficiencies.
 - 5. Interpreting tests and inspections and stating in each report whether tested and inspected work complies with or deviates from the Contract Documents.
 - 6. Retesting and reinspecting corrected work.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 TEST AND INSPECTION LOG

- A. Test and Inspection Log: Prepare a record of tests and inspections. Include the following:
 - 1. Date test or inspection was conducted.
 - 2. Description of the work tested or inspected.
 - 3. Date test or inspection results were transmitted to Architect.
 - 4. Identification of testing agency or special inspector conducting test or inspection.
- B. Maintain log at Project site. Post changes and revisions as they occur. Provide access to test and inspection log for Architects reference during normal working hours.
 - 1. Submit log at Project closeout as part of Project Record Documents.

3.2 REPAIR AND PROTECTION

- A. General: On completion of testing, inspection, sample taking and similar services, repair damaged construction and restore substrates and finishes.
 - 1. Provide materials and comply with installation requirements specified in other specification sections or matching existing substrates and finishes. Restore patched areas and extend restoration into adjoining areas with durable seams

that are as invisible as possible. Comply with the Contract Document requirements for cutting and patching in Section 017300 "Execution."

- B. Protect construction exposed by or for quality-control service activities.
- C. Repair and protection are Contractors responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION 014000

SECTION 01 42 00 - REFERENCES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this section.

1.2 DEFINITIONS

- A. General: Basic Contract definitions are included in the Conditions of the Contract.
- B. "Approved": When used to convey Architects action on Contractors submittals, applications and requests, "approved" is limited to Architects duties and responsibilities as stated in the Conditions of the Contract.
- C. "Directed": A command or instruction by Architect. Other terms including "requested," "authorized," "selected," "required," and "permitted" have the same meaning as "directed."
- D. "Indicated": Requirements expressed by graphic representations or in written form on drawings, in specifications and in other Contract Documents. Other terms including "shown," "noted," "scheduled," and "specified" have the same meaning as "indicated."
- E. "Regulations": Laws ordinances, statutes and lawful orders issued by authorities having jurisdiction and rules, conventions and agreements within the construction industry that control performance of the work.
- F. "Furnish": Supply and deliver to Project site, ready for unloading, unpacking, assembly, installation and similar operations.
- G. "Install": Unload, temporarily store, unpack, assemble, erect, place, anchor, apply, work to dimension, finish, cure, protect, clean and similar operations at Project site.
- H. "Provide": Furnish and install, complete and ready for the intended use.
- I. "Project Site": Space available for performing construction activities. The extent of Project site is shown on drawings and may or may not be identical with the description of the land on which Project is to be built.

1.3 INDUSTRY STANDARDS

- A. Applicability of Standards: Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.
- B. Publication Dates: Comply with standards in effect as of date of the Contract Documents unless otherwise indicated.
- C. Copies of Standards: Each entity engaged in construction on Project should be familiar with industry standards applicable to its construction activity. Copies of applicable standards are not bound with the Contract Documents.
 - 1. Where copies of standards are needed to perform a required construction activity, obtain copies directly from publication source.

1.4 ABBREVIATIONS AND ACRONYMS

- A. Industry Organizations: Where abbreviations and acronyms are used in specifications or other Contract Documents, they shall mean the recognized name of the entities indicated in Gales "Encyclopedia of Associations: National Organizations of the U.S." or in Columbia Books' "National Trade & Professional Associations of the United States."
- B. Industry Organizations: Where abbreviations and acronyms are used in specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. This information is subject to change and is believed to be accurate as of the date of the Contract Documents.
 - 1. AAMA - American Architectural Manufacturers Association; www.aamanet.org.
 - 2. AIA - American Institute of Architects (The); www.aia.org.
 - 3. ADAG - Accessibility Guidelines for Buildings and Facilities: www.access-board.gov
 - 4. AISC - American Institute of Steel Construction; www.aisc.org.
 - 5. ANSI - American National Standards Institute; www.ansi.org.
 - 6. ASTM - ASTM International; www.astm.org.
 - 7. CFR – Code of Federal Regulations: www.access.gpo.gov/nara/cfr
 - 8. CRSI - Concrete Reinforcing Steel Institute; www.crsi.org.
 - 9. FM Approvals - FM Approvals LLC; www.fmglobal.com.
 - 10. FS – Federal Specification: www.dodssp.daps.mil
 - 11. ICBO - International Conference of Building Officials; (See ICC).
 - 12. IAPMO - International Association of Plumbing and Mechanical; www.iapmo.org
 - 13. NFPA - National Fire Protection Association; www.nfpa.org.
 - 14. SJI - Steel Joist Institute; www.steeljoist.org.
 - 15. SMACNA - Sheet Metal and Air Conditioning Contractors' National Association; www.smacna.org.
 - 16. UL - Underwriters Laboratories Inc.; www.ul.com.
 - 17. USGBC - U.S. Green Building Council; www.usgbc.org.

- C. Code Agencies: Where abbreviations and acronyms are used in specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. This information is believed to be accurate as of the date of the Contract Documents.
1. ICC - International Code Council; www.iccsafe.org.
 2. ICC-ES - ICC Evaluation Service, LLC; www.icc-es.org.
 3. CABO - Council of American Building Officials
(See ICC)
 4. International Building Code
- D. Federal Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. Information is subject to change and is up to date as of the date of the Contract Documents.
1. DOE - Department of Energy; www.energy.gov.
 2. FG - Federal Government Publications; www.gpo.gov/fdsys.
 3. GSA - General Services Administration; www.gsa.gov.
 4. OSHA - Occupational Safety & Health Administration; www.osha.gov.
- E. Standards and Regulations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the standards and regulations in the following list. This information is subject to change and is believed to be accurate as of the date of the Contract Documents.
1. CFR - Code of Federal Regulations; Available from Government Printing Office; www.gpo.gov/fdsys.
 2. FED-STD - Federal Standard; (See FS).
 3. FS - Federal Specification; Available from DLA Document Services; www.quicksearch.dla.mil.
 - a. Available from Defense Standardization Program; www.dsp.dla.mil.
 - b. Available from General Services Administration; www.gsa.gov.
 - c. Available from National Institute of Building Sciences/Whole Building Design Guide; www.wbdg.org/ccb.
 4. USAB - United States Access Board; www.access-board.gov.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 014200

SECTION 014533 – CODE-REQUIRED SPECIAL INSPECTIONS AND PROCEDURES

GENERAL

1.01 DEFINITIONS

- A. Code or Building Code: ICC (IBC), International Building Code, most recent edition adopted by authority having jurisdiction, including all applicable amendments and supplements without limitation, and specifically Chapter 17 - Special Inspections and Tests.
- B. Authority Having Jurisdiction (AHJ): Agency or individual officially empowered to enforce the building, fire and life safety code requirements of the permitting jurisdiction in which the Project is located.
- C. NIST: National Institute of Standards and Technology.
- D. Special Inspections and Tests: Inspections and testing of materials, installation, fabrication, erection, or placement of components and connections mandated by Building Code to safeguard public welfare.
 - 1. Special inspections and tests are separate from and independent of tests and inspections conducted by Owner or Contractor for purposes of quality assurance and contract administration.
 - a. (P) Periodic inspection: the part-time or intermittent observation by the special inspector of work being performed. Special inspector shall be present in the area where the work is being performed. Observation of all work (100% visual) shall be made at the completion of the work.
 - b. (C) Continuous inspection: the full-time observation by the special inspector of work being performed. Special inspector shall be present in the area where the work is being performed. Observation of all work (100% visual) shall be made at the completion of the work.
 - c. (100%): 100% observation / testing prior to concealment of indicated element.
 - d. Testing and Inspection Type 1: Material Verification and Workman Certifications.
 - e. Testing and Inspection Type 2: Site Inspection for Layout and Quantities.
 - f. Testing and Inspection Type 3: Site Inspection for Procedures and Workmanship.
 - g. Testing and Inspection Type 4: Site Testing for Material Properties and Workmanship.
 - h. Testing and Inspection Type 5: Fabrication Facility Inspection and Testing for Workmanship.

1.02 REFERENCE STANDARDS

- A. ASTM E329 - Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection; 2025b.
- B. ICC (IBC) - International Building Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

1.03 SUBMITTALS

- A. See Section 013000 - Administrative Requirements for submittal procedures.
- B. Special Inspection Agency Qualifications: Prior to start of work, Special Inspection Agency is required to:
 - 1. Submit agency name, address, and telephone number, names of full time specialist and responsible officer.

2. Submit copy of report of laboratory facilities inspection made by NIST Construction Materials Reference Laboratory during most recent inspection, with memorandum of remedies of any deficiencies reported by the inspection.
 3. Submit certification that Special Inspection Agency is acceptable to AHJ.
- C. Testing Agency Qualifications: Prior to start of work, Testing Agency is required to:
1. Submit agency name, address, and telephone number, and names of full time specialist and responsible officer.
 2. Submit copy of report of laboratory facilities inspection made by NIST Construction Materials Reference Laboratory during most recent inspection, with memorandum of remedies of any deficiencies reported by the inspection.
 3. Submit certification that Testing Agency is acceptable to AHJ.
- D. Special Inspection Reports: After each special inspection, Special Inspector is required to submit at least two copies of report; one to Architect and one to AHJ.
1. Include:
 - a. Date issued.
 - b. Project title and number.
 - c. Name of Special Inspector.
 - d. Date and time of special inspection.
 - e. Identification of product and specifications section.
 - f. Location in the Project.
 - g. Type of special inspection.
 - h. Date of special inspection.
 - i. Results of special inspection.
 - j. Compliance with contract documents.
 2. Final Special Inspection Report: Document special inspections and correction of discrepancies prior to the start of the work.
- E. Fabricator Special Inspection Reports: After each special inspection of fabricated items at fabricator's facility, Special Inspector is required to submit report to Architect and to AHJ.
1. Include:
 - a. Date issued.
 - b. Project title and number.
 - c. Name of Special Inspector.
 - d. Date and time of special inspection.
 - e. Identification of fabricated item and specification section.
 - f. Location in the Project.
 - g. Results of special inspection.
 - h. Verification of fabrication and quality control procedures.
 - i. Compliance with contract documents.
 - j. Compliance with referenced standards.
- F. Test Reports: After each test or inspection, Testing Agency is required to submit report to Architect and to AHJ.
1. Include:
 - a. Date issued.
 - b. Project title and number.
 - c. Name of inspector.
 - d. Date and time of sampling or inspection.
 - e. Identification of product and specifications section.
 - f. Location in the Project.
 - g. Type of test or inspection.
 - h. Date of test or inspection.
 - i. Results of test or inspection.
 - j. Compliance with contract documents.

- G. Certificates: When required by AHJ, Special Inspector will submit certification by manufacturer, fabricator, and installation subcontractor to Architect and AHJ.
 - 1. Indicate material or product complies with or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.

1.04 SPECIAL INSPECTION AND TESTING AGENCY

- A. Owner or Architect to employ services of Special Inspection Agency to perform inspections and associated testing and sampling in accordance with ASTM E329 and required by building code.
- B. Special Inspection Agency may delegate to independent testing agency to perform testing and sampling associated with special inspections and required by building code.
- C. Employment of agency in no way relieves Contractor of obligation to perform work in accordance with requirements of contract documents.

1.05 TESTING AND INSPECTION AGENCIES

- A. Owner or Architect may employ services of independent testing agency to perform additional testing and sampling required by contract documents or associated with special inspections but not required by building code.
- B. Employment of agency in no way relieves Contractor of obligation to perform work in accordance with requirements of contract documents.

1.06 QUALITY ASSURANCE

- A. Special Inspection Agency Qualifications:
 - 1. Independent firm specializing in performing testing and inspections of the type specified in this section.
- B. Testing Agency Qualifications:
 - 1. Independent firm specializing in performing testing and inspections of the type specified in this section.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 SPECIAL INSPECTIONS AND TESTING

- A. The Code requires special inspections and testing of certain materials, components, assemblies, and connections used in constructing the project. Special inspections and testing will be performed in accordance with the Code.
- B. Special inspections and testing will be performed in accordance with the Code for the following materials and project components:
 - 1. Steel.
 - a. General
 - 1) Definitions:
 - (a) UT – Ultrasonic Testing.
 - (b) MT – Magnetic Particle Testing.
 - (c) PT – Penetration Testing.
 - 2) HDAS, HAS, DAS, Threaded studs
 - (a) Type 5: Fabrication Facility Inspection and Testing for Workmanship.
 - (b) Criteria: Review manufacturer certifications for fastener materials.
 - (c) Frequency: 100% observation / testing.
 - (d) Standard: AISC 360, Chapter N.
 - b. Prior to Bolting

- 1) Verify Manufacturer's Certifications
 - (a) Type 1: Material Verification and Workman Certifications.
 - (b) Criteria: Verify manufacturer's certifications available for fastener materials.
 - (c) Frequency: (C) Continuous inspection.
 - (d) Standard: AISC 360, Chapter N.
- 2) Preinstallation bolt testing
 - (a) Type 1: Material Verification and Workman Certifications.
 - (b) Criteria: Pre-installation verification testing by installation personnel observed and documented for fastener assemblies and methods used. Not applicable for snug tight joints.
 - (c) Frequency: (C) Continuous inspection.
 - (d) Standard: AISC 360, Chapter N.
- 3) Verify bolt material, diameter, handling
 - (a) Type 1: Material Verification and Workman Certifications.
 - (b) Criteria: Verify bolt material, diameter, and handling. Verify proper storage for fastener components. Verify fasteners marks in accordance with ASTM requirements.
 - (c) Frequency: (P) Periodic inspection.
 - (d) Frequency: (P) Periodic inspection.
 - (e) Standard: AISC 360, Chapter N.
- 4) Verify bolting procedure
 - (a) Type 3: Site Inspection for Procedures and Workmanship.
 - (b) Criteria: Verify proper fasteners (grade, type, bolt length if threads are to be excluded from shear plane) and bolting procedure selected for joint detail.
 - (c) Frequency: (P) Periodic inspection.
 - (d) Standard: AISC 360, Chapter N.
- 5) Verify connecting element preparation
 - (a) Type 3: Site Inspection for Procedures and Workmanship.
 - (b) Criteria: Verify connecting elements meet requirements (if specified), including hole preparation and faying surface condition.
 - (c) Frequency: (P) Periodic inspection.
 - (d) Standard: AISC 360, Chapter N.
- c. During Bolting
 - 1) Verify bolts in all holes
 - (a) Type 3: Site Inspection for Procedures and Workmanship.
 - (b) Criteria: Verify fastener assemblies of suitable condition placed in all holes and washers are positioned as required.
 - (c) Frequency: (P) Periodic inspection.
 - (d) Standard: AISC 360, Chapter N.
 - 2) Verify bolts positioned as required
 - (a) Type 3: Site Inspection for Procedures and Workmanship.
 - (b) Criteria: Verify fasteners placed in all holes and positioned as required.
 - (c) Frequency: (P) Periodic inspection.
 - (d) Standard: AISC 360, Chapter N.
 - 3) Installation at pretensioned and slip-critical
 - (a) Type 3: Site Inspection for Procedures and Workmanship.
 - (b) Criteria: Joint brought in snug-tight condition prior to pre-tensioning, fastener prevented from rotating. Fasteners pretensioned in proper sequence (from the most rigid point toward the free edges). Pretensioned and slip-critical joints using calibrated wrench or turn-of-nut method without matchmarking. Inspector shall be present during installation of fasteners.
 - (c) Frequency: (C) Continuous inspection.
 - (d) Standard: AISC 360, Chapter N, RCSC Specification.

- d. After Bolting
 - 1) Document acceptance/rejection of joints.
 - (a) Type 3: Site Inspection for Procedures and Workmanship.
 - (b) Criteria: Document acceptance/rejection of bolted connections, member or joint.
 - (c) Frequency: (C) Continuous inspection.
 - (d) Standard: AISC 360, Chapter N.
- e. Prior to Welding
 - 1) Verify welder qualifications and ID system
 - (a) Type 1: Material Verification and Workman Certifications.
 - (b) Criteria: Review manufacturer certifications for welding consumables and welding procedure specifications. Verify welder identification system. Note: The fabricator or erector, as applicable, shall maintain a system by which a welder who has welded a joint or member can be identified. Stamps, if used, shall be the low-stress type.
 - (c) Frequency: (C) Continuous inspection.
 - (d) Standard: AISC 360, Chapter N.
 - 2) Verify WPS available
 - (a) Type 1: Material Verification and Workman Certifications.
 - (b) Criteria: Verify Welding Procedure Specification available.
 - (c) Frequency: (C) Continuous inspection.
 - (d) Standard: AISC 360, Chapter N.
 - 3) Verify base material and weld material
 - (a) Type 1: Material Verification and Workman Certifications.
 - (b) Criteria: Verify base material and weld material are in conformance with approved documents.
 - (c) Frequency: (P) Periodic inspection.
 - (d) Standard: AISC 360, Chapter N.
 - 4) Verify weld procedures and weld equipment
 - (a) Type 1: Material Verification and Workman Certifications.
 - (b) Criteria: Verify weld procedures and weld equipment are in conformance with approved documents.
 - (c) Frequency: (C) Continuous inspection.
 - (d) Standard: AISC 360, Chapter N.
 - 5) Verify joint fit-up, prep, backing, etc
 - (a) Type 2: Site Inspection for Layout and Quantities.
 - (b) Criteria: Verify fit up of groove welds (including joint geometry) meet requirements for joint preparation, dimensions (alignment, root opening, root face, bevel), cleanliness (condition of steel surfaces), tacking (tack weld quality and location), and backing type and fit (if applicable). Verify fit up of fillet welds meet requirements for dimensions (alignment, gaps at root), cleanliness (condition of steel surfaces), and tacking (tack weld quality and location). Verify configuration and finish of access holes.
 - (c) Frequency: (P) Periodic inspection.
 - (d) Standard: AISC 360, Chapter N
- f. During Welding
 - 1) Use of qualified welders
 - (a) Type 1: Material Verification and Workman Certifications.
 - (b) Criteria: Verify welder certifications.
 - (c) Frequency: (P) Periodic Inspection.
 - (d) Standard: AISC 360, Chapter N.
 - 2) Handling of welding consumables
 - (a) Type 3: Site Inspection for Procedures and Workmanship.

- (b) Criteria: Verify proper control and handling of welding consumables including packaging and exposure control.
 - (c) Frequency: (P) Periodic inspection.
 - (d) Standard: AISC 360, Chapter N.
- 3) No welding over cracked tack welds
 - (a) Type 3: Site Inspection for Procedures and Workmanship.
 - (b) Criteria: Verify no welding over cracked tack welds.
 - (c) Frequency: (P) Periodic inspection.
 - (d) Standard: AISC 360, Chapter N.
- 4) Environment conditions (wind/temp, etc.).
 - (a) Type 3: Site Inspection for Procedures and Workmanship.
 - (b) Criteria: Verify Welding Procedure Specification is followed for Environment conditions. Verify wind speed, precipitation, and temperature are within limits.
 - (c) Frequency: (P) Periodic inspection.
 - (d) Standard: AISC 360, Chapter N.
- 5) Verify WPS followed
 - (a) Type 3: Site Inspection for Procedures and Workmanship.
 - (b) Criteria: Verify use of qualified welders. Verify Welding Procedure Specification is followed for settings on welding equipment, travel speed, selected welding materials, shielding gas type/flow rate, preheat applied, interpass temperature maintained (minimum and maximum), proper position (F, V, H, OH).
 - (c) Frequency: (P) Periodic inspection.
 - (d) Standard: AISC 360, Chapter N.
- 6) Welding techniques
 - (a) Type 3: Site Inspection for Procedures and Workmanship.
 - (b) Criteria: Verify proper welding techniques for single and multi-pass welds (interpass and final cleaning, each pass within profile limitations, each pass meets quality requirements).
 - (c) Frequency: (P) Periodic inspection.
 - (d) Standard: AISC 360, Chapter N.
- g. After Welding
 - 1) Verify welds cleaned
 - (a) Type 3: Site Inspection for Procedures and Workmanship.
 - (b) Criteria: Verify welds cleaned in accordance with standard.
 - (c) Frequency: (P) Periodic inspection.
 - (d) Standard: AISC 360, Chapter N.
 - 2) Verify weld size, length and location
 - (a) Type 3: Site Inspection for Procedures and Workmanship.
 - (b) Criteria: Verify weld size, length and location conform to approved documents.
 - (c) Frequency: (C) Continuous inspection.
 - (d) Standard: AISC 360, Chapter N.
 - 3) Welds meet visual acceptance criteria
 - (a) Type 3: Site Inspection for Procedures and Workmanship.
 - (b) Criteria: Verify welds meet visual acceptance criteria for crack prohibition, weld/base metal fusion, crater cross section, weld profiles, weld size, undercut, and porosity. Where inspector observes questionable welds, non-destructive testing shall be performed.
 - (c) Frequency: (C) Continuous inspection.
 - (d) Standard: AISC 360, Chapter N, AWS D1.1.
 - 4) Arc strikes

- (a) Type 3: Site Inspection for Procedures and Workmanship.
 - (b) Criteria: Verify no arc strikes are present in the base material. Arc strikes shall be tested using non-destructive methods and repaired if necessary.
 - (c) Frequency: (C) Continuous inspection.
 - (d) Standard: AISC 360, Chapter N.
- 5) Verify no cracking in k-areas and at weld access holes
 - (a) Type 3: Site Inspection for Procedures and Workmanship.
 - (b) Criteria: When welding of doubler plates, continuity plate, or stiffeners has been performed in the k-area, visually inspect the web k-area for cracks within 3 inches of the weld.
 - (c) Frequency: (C) Continuous inspection.
 - (d) Standard: AISC 360, Chapter N.
- 6) Repair activities
 - (a) Type 3: Site Inspection for Procedures and Workmanship.
 - (b) Criteria: Verify repair activities conform to standard. Backing and weld tabs removed, and fillet welds added where required.
 - (c) Frequency: (C) Continuous inspection.
 - (d) Standard: AISC 360, Chapter N.
- 7) Document acceptance/rejection of joints
 - (a) Type 3: Site Inspection for Procedures and Workmanship.
 - (b) Criteria: Document acceptance/rejection of welded joints and/or members.
 - (c) Frequency: (C) Continuous inspection.
 - (d) Standard: AISC 360, Chapter N.
- 8) UT CJP welds, material $\geq 5/16"$, III and IV
 - (a) Type 4: Site Testing for Material Properties and Workmanship.
 - (b) Criteria: Only applies for buildings assigned to Risk Category III or IV. Ultrasonic testing of complete joint penetration groove welds subject to transversely applied tension loading in butt, T- and corner joints, in materials thicker than $5/16"$.
 - (c) Frequency: 100% observation / testing. It is acceptable for the rate of UT to be decreased to 25% if the reject rate of the first 40 inspections is less than or equal to 5%.
 - (d) Standard: AISC 360, Chapter N.
- h. Steel Joists
 - 1) Verify end connections
 - (a) Verify end connections.
 - (b) Type 3: Site Inspection for Procedures and Workmanship.
 - (c) Criteria: Verify welded or bolted end connections for steel joists and joist girders.
 - (d) Frequency: (P) Periodic inspection.
 - (e) Standard: AISC 360, Chapter N. SJI – K and LH/DLH.
 - 2) Verify joist bridging installation
 - (a) Type 3: Site Inspection for Procedures and Workmanship.
 - (b) Criteria: Verify horizontal or diagonal bridging is installed and anchored as indicated in shop drawings.
 - (c) Frequency: (P) Periodic inspection.
 - (d) Standard: AISC 360, Chapter N. SJI – K and LH/DLH
- i. Steel Deck
 - 1) Prior to Installation
 - (a) Verify deck profile, grade and thickness
 - (1) Type 1: Material Verification and Workman Certifications.

- (2) Criteria: Verify compliance of materials (deck and all deck accessories) with construction documents, including profiles, material properties, and base metal thickness.
 - (3) Frequency: 100% observation / testing.
 - (4) Standard: SDI QA/QC.
 - (b) Document acceptance/rejection of deck
 - (1) Type 1: Material Verification and Workman Certifications.
 - (2) Criteria: Document acceptance/rejection of deck and deck accessories.
 - (3) Frequency: 100% observation / testing.
 - (4) Standard: SDI QA/QC.
 - (c) Fastener manufacturer installation instructions are available
 - (1) Type 1: Material Verification and Workman Certifications.
 - (2) Criteria: Verify fastener manufacturer installation instructions are available for mechanical fasteners.
 - (3) Frequency: (P) Periodic inspection.
 - (4) Standard: SDI QA/QC.
 - (d) Verify proper tools are available for deck installation
 - (1) Type 1: Material Verification and Workman Certifications.
 - (2) Criteria: Verify proper tools are available for deck installation.
 - (3) Frequency: (P) Periodic inspection.
 - (4) Standard: SDI QA/QC.
 - (e) Verify deck fastener storage and handling
 - (1) Type 2: Site Inspection for Layout and Quantities.
 - (2) Criteria: Verify proper storage for mechanical fasteners.
 - (3) Frequency: (P) Periodic inspection.
 - (4) Standard: SDI QA/QC.
- 2) During Installation
 - (a) Verify deck type and layout
 - (1) Type 2: Site Inspection for Layout and Quantities.
 - (2) Criteria: Verify deck type and layout conforms to approved documents.
 - (3) Frequency: (P) Periodic inspection.
 - (4) Standard: SDI QA/QC.
 - (b) Verify deck fastening (PAF / Screws / Welds) type, size, spacing and layout
 - (1) Type 2: Site Inspection for Layout and Quantities.
 - (2) Criteria: Verify deck fastening (PAF / Screws / Welds) type, size, spacing and layout conform to approved documents.
 - (3) Frequency: (P) Periodic inspection.
 - (4) Standard: SDI QA/QC.
 - (c) Verify fasteners are installed per manufacturer instructions and are fully seated
 - (1) Type 3: Site Inspection for Procedures and Workmanship.
 - (2) Criteria: Verify fasteners are installed per manufacturer instructions and are fully seated and positioned correctly.
 - (3) Frequency: (P) Periodic inspection.
 - (4) Standard: SDI QA/QC
 - (d) Welding requirements - See welding requirements in Structural Steel
- 3) After Installation
 - (a) Verify compliance of deck and deck accessories
 - (1) Type 3: Site Inspection for Procedures and Workmanship.
 - (2) Criteria: Verify compliance of deck and deck accessories comply with construction documents. Verify deck materials are represented by the mill certifications that comply with the construction documents.

- (3) Frequency: 100% observation / testing.
 - (4) Standard: SDI QA/QC.
 - (b) Verify support and sidelap connection type, size, spacing and layout
 - (1) Type 2: Site Inspection for Layout and Quantities.
 - (2) Criteria: Check spacing, type, diameter, and installation of support, sidelap, and perimeter fasteners. Verify screws adequately penetrate base material (3 threads min). Verify repair activities. No popped screw heads or stripped screws are permitted. All damage screws shall be replaced. Verify PAF's are fully driven.
 - (3) Frequency: 100% observation / testing.
 - (4) Standard: SDI C, SDI NC, SDI RD, ICC-ES Reports.
 - (c) Inspect connection installation
 - (1) Type 3: Site Inspection for Procedures and Workmanship.
 - (2) Criteria: Verify connection installation conforms to standard.
 - (3) Frequency: 100% observation / testing.
 - (4) Standard: SDI QA/QC, SDI C, SDI NC, SDI RD, ICC-ES Reports
 - (d) Document acceptance/rejection of deck connections
 - (1) Type 2: Site Inspection for Layout and Quantities.
 - (2) Criteria: Document acceptance/rejection of deck, accessories, and connections. Verify materials have been drawn together.
 - (3) Frequency: 100% observation / testing.
 - (4) Standard: SDI C, SDI NC, SDI RD.
- 2. Concrete.
 - a. Before Placement Inspections
 - 1) Formwork Dimensional Layout.
 - (a) Type 2: Site inspection for Layout and Quantities.
 - (b) Criteria: Prior to placement of concrete inspect formwork of first pour of each type (footing, stem walls, slab-on-grade, etc.).
 - (c) Frequency: (P) Periodic inspection.
 - (d) Standard: ACI 301-16 2.2-2.3
 - 2) Reinforcing Steel Placement.
 - (a) Type 2: Site inspection for Layout and Quantities.
 - (b) Criteria: Verify grade, finish, size, bar quantity, location, spacing, cover, hook lengths, splice lengths, splice locations, bend diameters, coating, surface conditions, and supports.
 - (c) Frequency: 100% observation / testing.
 - (d) Standard: ACI 301-16 3.2-3.3.
 - 3) Reinforcement Welding.
 - (a) Type 3: Site Inspection for Procedures and Workmanship.
 - (b) Criteria: Verify ASTM A706 reinforcing steel. Inspect all welds.
 - (c) Frequency: (C) Continuous inspection.
 - (d) Standard: AWS D1.4.
 - 4) Reinforcement Field Bending.
 - (a) Type 3: Site Inspection for Procedures and Workmanship.
 - (b) Criteria: Inspect reinforcement field bending.
 - (c) Frequency: (P) Periodic inspection.
 - (d) Standard: ACI 301-16 3.3.2.8.
 - 5) Epoxy Reinforcing
 - (a) Type 1: Material Verification and Workman Certifications.
 - (b) Criteria: Inspect epoxy or galvanized reinforcing.
 - (c) Frequency: 100% observation / testing.
 - (d) Standard: ACI 301-16 3.2.1.2.
 - b. During Placement Inspections

- 1) Verify Design Mix
 - (a) Type 1: Material Verification and Workman Certifications.
 - (b) Criteria: Verify use of approved design mixture for each truck load.
 - (c) Frequency: 100% observation / testing.
 - (d) Standard: ACI 318 Ch. 19, 26.4.3, 26.4.4.
- 2) Concrete Placement Inspection
 - (a) Type 3: Site Inspection for Procedures and Workmanship.
 - (b) Criteria: Inspect placement of concrete per standard (see below).
 - (c) Frequency: (C) Continuous inspection.
 - (d) Standard: ACI 301-16 5.3.2.
- 3) Concrete Curing Inspection
 - (a) Type 3: Site Inspection for Procedures and Workmanship.
 - (b) Criteria: Inspect curing of concrete per standard (see below).
 - (c) Frequency: (P) Periodic inspection.
 - (d) Standard: ACI 301-16 5.3.6.
- c. During Placement Testing:
 - 1) Composite Concrete Sample – $f'_c < 5000$ PSI.
 - (a) Type 4: Site Testing for Material Properties and Workmanship.
 - (b) Criteria: Obtain sample at point of placement. For drilled piers obtain near beginning of load prior to placement in shaft.
 - (c) Frequency: At least once a day or at least once for each 100 cubic yards of concrete or at least once for each 5,000 square feet of surface area for slabs and walls. Adjust frequency as required to provide minimum 5 total tests per mix but not more than one sample per truck load.
 - 2) Slump/Slump Flow
 - (a) Type 4: Site Testing for Material Properties and Workmanship.
 - (b) Criteria: Specified slump shall be as submitted in the mix design $\pm 1\frac{1}{2}$ ". perform additional tests when concrete consistency appears to change.
 - (c) Frequency: Each composite sample (see above).
 - (d) Standard: ASTM C143 (slump) or ASTM C1611 (slump flow).
 - 3) Temperature
 - (a) Type 4: Site Testing for Material Properties and Workmanship.
 - (b) Criteria: Test per standard (see below). Required when air temperature is 40 °F and below or 80°F and above.
 - (c) Frequency: Each composite sample (see above) and at 60 minute intervals.
 - (d) Standard: ASTM C1064.
 - 4) Cold Weather Curing
 - (a) Type 4: Site Testing for Material Properties and Workmanship.
 - (b) Criteria: Record maximum and minimum concrete temperature during curing period when daily average air temperature of 40 °F or below is expected for 3 successive days during curing period.
 - (c) Frequency: N/A
 - (d) Standard: ASTM C1074.
 - 5) Compressive Strength
 - (a) Type 4: Site Testing for Material Properties and Workmanship.
 - (b) Criteria: Reports of compressive strength tests shall contain the following information: date of concrete placement, location of concrete batch in work, design 28-day compressive strength, concrete supplier and mixture ID number, time of batch and placement, ambient air temperature, site added water and admixtures, unit weight, and as required by ASTM C39. Acceptance criteria per ACI 318.
 - (c) Frequency: Test per schedule below:
 - (1) 7 days: 6x12 or 4x8

- (2) 28 days: 6x12 or 4x8
 - (3) 56 days: 6x12 or 4x8 (if 28 day tests do not achieve specified 28 day strength).
 - (d) Standard: ASTM C31, ASTM C39. Either 6x12 or (6) 4x8 cylinders.
- d. After Placement
 - 1) Cold Weather Curing.
 - (a) Type 3: Site Inspection for Procedures and Workmanship.
 - (b) Criteria: Inspect curing of concrete per standard (see below).
 - (c) Frequency: (P) Periodic inspection.
 - (d) Standard: ACI 301-16 5.3.6.
 - 2) Floor Flatness and Levelness.
 - (a) Type 4: Site Testing for Material Properties and Workmanship.
 - (b) Criteria: Perform measurements within 48 hours of finishing operations and prior to removal of shores or forms.
 - (c) Frequency: (P) Periodic inspection.
 - (d) Standard: ASTM E1155.
- e. Precast
 - 1) Inspect erection of precast concrete members
 - (a) Type 3: Site Inspection for Procedures & Workmanship.
 - (b) Criteria: During erection, precast members shall be supported and braced to ensure proper alignment, strength, and stability until permanent connections are completed.
 - (c) Frequency: (P) Periodic Inspection.
 - (d) Standard: ACI 318 26.9.
 - 2) Grout Special Inspection Requirements
 - (a) The Contractor shall provide the special inspector a copy of the PCI Certified Erector's QA/QC procedures, precast erection plans which clearly identify all grouting locations, sequence requirements and limitations, and the material specifications and procedures for all grout mixes.
 - (b) Periodically verify that the PCI Certified Erector's QA/QC program is being executed as submitted and approved
- f. Post Installed Anchors: Expansion, Sleeve and Screw Anchor
 - 1) Before Installation:
 - (a) Installation Procedure
 - (1) Type 1: Material Verification and Workman Certifications.
 - (2) Criteria: Review contractor's installation procedure.
 - (3) Frequency: 100% observation / testing.
 - (4) Standard: ICC-ES Report.
 - (b) Verify Anchor Type, Diameter, and Materials
 - (1) Type 2: Site Inspection for Layout and Quantities.
 - (2) Criteria: Verify anchor products to be used for compliance of anchor type, diameter, materials and product
 - (3) Frequency: 100% observation / testing.
 - (4) Standard: ICC-ES Report.
 - (c) Verify Max Allowed Impact Wrench Torque.
 - (1) Type 3: Site Inspection for Procedures and Workmanship.
 - (2) Criteria: For screw anchors, confirm the maximum allowed impact wrench torqued as defined by the manufacturer.
 - (3) Frequency: (C) Continuous inspection.
 - (4) Standard: ICC-ES Report.
 - 2) During Installation:
 - (a) Continuous inspection required regardless if periodic inspection is permitted by ICC-ES report.

- (b) Verify Hole Layout.
 - (1) Type 2: Site inspection for Layout and Quantities.
 - (2) Criteria: Verify the hole layout matches the contract documents. Review of layout should include number of anchors, spacing, edge distances, and quantity.
 - (3) Frequency: (C) Continuous inspection.
 - (4) Standard: ICC-ES Report.
 - (c) Grout Extents Around Masonry Anchors.
 - (1) Type 2: Site inspection for Layout and Quantities.
 - (2) Criteria: At masonry anchors, confirm the grout extents surrounding the anchor have been satisfied.
 - (3) Frequency: (C) Continuous inspection.
 - (4) Standard: ICC-ES Report.
 - (d) Verify Hole Diameter, Depth, Cleaning
 - (1) Type 2: Site inspection for Layout and Quantities.
 - (2) Criteria: Verify the hole diameter and depth meet the manufacturer requirements and the requirements shown on the contract documents. Observe the hole cleaning procedure is in accordance with the anchor manufacturers recommendations.
 - (3) Frequency: (C) Continuous inspection.
 - (4) Standard: ICC-ES Report.
 - (e) Verify Anchor Installation
 - (1) Type 3: Site Inspection for Procedures and Workmanship.
 - (2) Criteria: Verify the anchor installation of the anchor is in accordance with the anchor manufacturer recommendations.
 - (3) Frequency: (C) Continuous inspection.
 - (4) Standard: ICC-ES Report.
- 3) After Installation:
 - (a) Verify Installation of Attached Assembly
 - (1) Type 3: Site Inspection for Procedures and Workmanship.
 - (2) Criteria: Verify number, edge distances, and anchor flush with and perpendicular to the receiving surface.
 - (3) Frequency: (C) Continuous inspection
 - (b) Torque Test Anchors
 - (1) Type 4: Site Testing for Material Properties and Workmanship.
 - (2) Criteria: Test anchor with calibrated torque wrench to 100% of the installation torque noted in ICC-ES report. Attain specified torque within 1/2 turn of the nut.
 - (3) Frequency: 100% observation / testing.
 - (4) Standard: ICC-ES Report.
- g. Post Installed Anchors: Adhesive and Reinforcing
 - 1) Before Installation
 - (a) Installation Procedure
 - (1) Type 1: Material Verification and Workman Certifications.
 - (2) Criteria: Review contractor's installation procedure. Verify adhesive to be used for product type, manufacturer recommendations, expiration dates, pot life, working temperature ranges for adhesives, substrates and anchors.
 - (3) Frequency: 100% observation / testing.
 - (4) Standard: ICC-ES Report.
 - (b) Verify Anchor Type, Diameter and Materials
 - (1) Type 2: Site inspection for Layout and Quantities.

- (2) Criteria: Verify anchor to be used for compliance of anchor type, diameter, length, finish, and base material. Verify solid grouted area around anchors in grouted masonry
 - (3) Frequency: 100% observation / testing.
 - (4) Standard: ICC-ES Report.
- 2) During Installation
 - (a) Continuous inspection required regardless if periodic inspection is permitted by ICC-ES report.
 - (b) Verify Hole Layout
 - (1) Type 2: Site inspection for Layout and Quantities.
 - (2) Criteria: Verify the hole layout matches the contract documents. Review of layout should include number of anchors, spacing, edge distances, and quantity.
 - (3) Frequency: (C) Continuous inspection.
 - (4) Standard: ICC-ES Report.
 - (c) Grout Extents Around Masonry Anchors.
 - (1) Type 2: Site inspection for Layout and Quantities.
 - (2) Criteria: At masonry anchors, confirm the grout extents surrounding the anchor have been satisfied.
 - (3) Frequency: (C) Continuous inspection.
 - (4) Standard: ICC-ES Report.
 - (d) Verify Hole Diameter, Depth and Cleaning.
 - (1) Type 2: Site inspection for Layout and Quantities.
 - (2) Criteria: Verify the hole diameter and depth meet the manufacturer requirements and the requirements shown on the contract documents. Observe the hole cleaning procedure is in accordance with the adhesive manufacturer's recommendations.
 - (3) Frequency: (C) Continuous inspection.
 - (4) Standard: ICC-ES Report.
 - (e) Verify Anchor Installation.
 - (1) Type 3: Site Inspection for Procedures and Workmanship.
 - (2) Criteria: Verify the anchor installation of the anchor is in accordance with the adhesive manufacturer's recommendations. Verify the temperatures of the adhesive, substrate and anchors are within the manufacturer recommended ranges.
 - (3) Frequency: (C) Continuous inspection.
 - (4) Standard: ICC-ES Report.
- 3) After Installation
 - (a) Verify Installation of Attached Assembly.
 - (1) Type 3: Site Inspection for Procedures and Workmanship.
 - (2) Criteria: Verify number, edge distances, and anchor flush with and perpendicular to the receiving surface. Verify full cure time has elapsed prior to application of torque or load to anchor.
 - (3) Frequency: (C) Continuous inspection.
 - (b) Tension Test Anchors / Reinforcing
 - (1) Type 4: Site Testing for Material Properties and Workmanship.
 - (2) Criteria: Test the installation of the first 3 of each type, base material, and position (down, horizontal, overhead). Observe ASTM E488 minimum edge distances for determining test locations. Submit Proposed test locations and requests for required tension test load values to engineer.
 - (3) Frequency: First 3 and 1% of remaining.
 - (4) Standard: ASTM E488 Static Tension.

3. Masonry.
 - a. Before Construction Begins:
 - 1) Compliance with Approved Submittals
 - (a) Type 2: Site Inspection for Layout and Quantities.
 - (b) Criteria: Verify Compliance with Approved Submittals.
 - (c) Frequency: (P) Periodic inspection.
 - (d) Standard: TMS 602, Art 1.5
 - 2) Observe Preparation of Grout Specimens, Mortar Specimens, and/or Prisms (if required due to insufficient submittals)
 - (a) Type 3: Site Inspection for Procedures and Workmanship.
 - (b) Criteria: Verify Compliance with the Standard.
 - (c) Frequency: (P) Periodic inspection.
 - (d) Standard: TMS 602, Art 1.4.B.2, 1.4.B.3, 1.4.B.4.
 - b. As Construction Begins
 - 1) Verify f'm.
 - (a) Type 1: Material Verification and Workman Certifications.
 - (b) Criteria: Verify Specified Compressive Strength of Masonry, f'm conforms to structural drawings and specifications.
 - (c) Frequency: 100% observation / testing
 - 2) Proportions of Site-prepared Mortar
 - (a) Type 1: Material Verification and Workman Certifications.
 - (b) Criteria: Verify Proportions of Site-prepared Mortar conform to standard.
 - (c) Frequency: (P) Periodic inspection.
 - (d) Standard: TMS 602, Art 2.1 and 2.6A.
 - 3) Reinforcement, anchorages, connectors, embeds
 - (a) Type 2: Site Inspection for Layout and Quantities.
 - (b) Criteria: Grade, type, and size of reinforcement, connectors, anchor bolts, and prestressing tendons and anchorages.
 - (c) Frequency: (P) Periodic inspection.
 - (d) Standard: TMS602, Art 3.4.
 - 4) Sample Panel Construction
 - (a) Type 3: Site Inspection for Procedures and Workmanship.
 - (b) Criteria: Use of materials and procedures accepted for the work. Minimum panel dimensions are 4 feet by 4 feet. The acceptable standard for the work is established by the accepted panel.
 - (c) Frequency: (P) Periodic Inspection.
 - (d) Standard: TMS 602, Art 1.6D.
 - c. During Construction
 - 1) Placement of Masonry Units and Mortar Joint Construction
 - (a) Type 2: Site Inspection for Layout and Quantities.
 - (b) Criteria: Verify placement of masonry units and mortar joint construction is in compliance with the standard.
 - (c) Frequency: (P) Periodic inspection.
 - (d) Standard: TMS 602, Art. 3.3B.
 - 2) Size and Location of Elements
 - (a) Type 2: Site Inspection for Layout and Quantities.
 - (b) Criteria: Verify Size and Location of Structural Elements conforms to drawings and specifications.
 - (c) Frequency: (P) Periodic inspection.
 - (d) Standard: TMS 602, Art. 3.3F.
 - 3) Type, size and location reinforcement and embeds
 - (a) Type 2: Material Verification and Workman Certifications.

- (b) Criteria: Verify type, size, and location of anchors, including other details of anchorage of masonry to structural members, frames, or other constructions.
 - (c) Frequency: (P) Periodic inspection.
 - 4) Welding of Reinforcement
 - (a) Type 3: Site Inspection for Procedures and Workmanship.
 - (b) Criteria: Inspection and testing of welding of reinforcement per Steel table and specifications.
 - (c) Frequency: (C) Continuous inspection.
 - (d) Standard: Per Steel table and specifications.
 - 5) Cold (<40F) and Hot (>90F) Weather
 - (a) Type 3: Site Inspection for Procedures and Workmanship.
 - (b) Criteria: Verify Preparation, construction, and protection of masonry during hot and cold weather conform to standard.
 - (c) Frequency: (P) Periodic inspection.
 - (d) Standard: TMS 602, Art. 1.8C and 1.8D.
- d. Prior to Grouting
 - 1) Grout space
 - (a) Type 3: Site Inspection for Procedures and Workmanship.
 - (b) Criteria: Verify grout space is free of mortar droppings and debris, and cleanouts provided as required.
 - (c) Frequency: (P) Periodic inspection.
 - (d) Standard: TMS 602, Art. 3.2D and 3.2F.
 - 2) Reinforcement, Anchorages, Connectors, Embeds.
 - (a) Type 2: Site Inspection for Layout and Quantities.
 - (b) Criteria: Verify type, size, quantity, location, spacing, cover, splice length, splice location, surface condition, support, and securing. See structural concrete table and specifications for field bending, coated reinforcement, and mechanical connectors.
 - (c) Frequency: (P) Periodic inspection, 100% observation/testing.
 - (d) Standard: TMS602, Art. 2.4 and 3.4, Structural concrete table and specifications.
 - 3) Proportions of Site Mixed Grout
 - (a) Type 1: Material Verification and Workman Certifications.
 - (b) Criteria: Verify Proportions of Site Mixed Grout conform to ASTM C476
 - (c) Frequency: (P) Periodic inspection
 - (d) Standard: TMS 602, Art. 2.6B, ASTM C476.
 - 4) Mix Design for Off-Site Prepared Grout.
 - (a) Type 1: Material Verification and Workman Certifications.
 - (b) Criteria: Verify Mix Design for Off-Site Prepared Grout conforms to standard.
 - (c) Frequency: 100% observation / testing.
 - (d) Standard: TMS 602, Art. 2.6B, ASTM C476.
- 4. Soils.
 - a. Excavation Extents and Depths
 - 1) Type 2: Site inspection for Layout and Quantities.
 - 2) Criteria: Verify excavations are extended to the proper depth and have reached the proper material.
 - 3) Frequency: (P) Periodic inspection.
 - b. Subgrade Material Verification
 - 1) Type 2: Site inspection for Layout and Quantities.
 - 2) Criteria: Prior to placement of compacted fill, inspect subgrade and verify that site has been prepared properly.

- 3) Frequency: (P) Periodic inspection.
- c. Fill materials
 - 1) Type 2: Site inspection for Layout and Quantities.
 - 2) Criteria: Perform classification and testing of compacted fill materials.
 - 3) Frequency: (P) Periodic inspection
- d. Controlled Fill Placement
 - 1) Type 2: Site inspection for Layout and Quantities.
 - 2) Criteria: Verify use of proper materials, densities, compaction, and lift thicknesses during placement and compaction of compacted fill.
 - 3) Frequency: (C) Continuous inspection.
- e. Bearing Material Verification
 - 1) Type 4: Site Testing for Material Properties and Workmanship.
 - 2) Frequency: (P) Periodic inspection.
 - 3) Standard: Geotechnical Investigation Report
- f. See civil drawings and/or specifications for additional earthwork and utility inspection requirements
- g. See civil drawings and/or specifications for classification and testing requirements for compacted fill and/or controlled low-strength material
5. Fabricated items.
 - a. General
 - 1) Perform inspections and testing for all shop fabricated structural members and assemblies as noted herein. Special inspector shall perform special inspections and testing unless the fabricator is registered and approved by the authority having jurisdiction to perform such work without special inspection or fabrication has a current ICC-ES evaluation report
 - 2) Special inspector shall verify the fabricator maintains and follows detailed shop fabrication and quality control procedures, unless fabricator is registered and approved.
 - 3) At the completion of fabrication, the approved fabricator shall submit a certificate of compliance to the authority having jurisdiction according to IBC 2024 section 1704.2.5.1
 - 4) Approved fabricators may perform testing noted herein except that nondestructive testing (NDT) shall only be performed by personnel with qualifications that meet or exceed the criteria of AWS D1.1 subclause 6.14.6 and American Society for Nondestructive Testing (ASNT) SNT-TC-1A or ASNT CP-189.
 - b. Shop Fabrications Included
 - 1) Shop fabricated structural steel including stairs and railing elements
 - 2) Shop fabricated cold formed steel elements
 - 3) Structural precast concrete
6. Structural observations required by ICC (IBC) section 1704.6.

3.02 DEFICIENCIES IN WORK

- A. Correct deficiencies in work that tests and inspections indicate do not comply with the contract documents and referenced standards.
- B. All cost of additional testing and/or inspections for corrective work shall be borne by the contractor.

END OF SECTION 014533

SECTION 015000 - TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this section.

1.2 SUMMARY

- A. Section includes requirements for temporary utilities, support facilities and security and protection facilities.
- B. Related Requirements:
 - 1. Section 011000 "Summary" for work restrictions and limitations on utility interruptions.

1.3 USE CHARGES

- A. General: Installation and removal of and use charges for temporary facilities shall be included in the Contract Sum unless otherwise indicated. Allow other entities engaged in the Project to use temporary services and facilities without cost including but not limited to Owners construction forces Architect, testing agencies and authorities having jurisdiction.
- B. Sewer Service: Contractor shall pay sewer-service use charges for sewer usage by all entities for construction operations.
- C. Water Service: Contractor shall pay water-service use charges for water used by all entities for construction operations.
- D. Electric Power Service: Contractor shall pay electric power service use charges for electricity used by all entities for construction operations.
- E. Temporary Gas Service: Contractor shall pay gas service use charges for gas used by all entities for construction operations.

1.4 INFORMATIONAL SUBMITTALS

- A. Site Utilization Plan: Show temporary facilities, temporary utility lines and connections, staging areas, construction site entrances, vehicle circulation and parking areas for construction personnel.

- B. Implementation and Termination Schedule: Within 15-days of date established for commencement of the work, submit schedule indicating implementation and termination dates of each temporary utility.
- C. Project Identification and Temporary Signs: Show fabrication and installation details, including plans, elevations, details, layouts, type styles, graphic elements and message content.
- D. Fire-Safety Program: Show compliance with requirements of NFPA 241 and authorities having jurisdiction. Indicate Contractors personnel responsible for management of fire-prevention program.
- E. Moisture and Mold-Protection Plan: Describe procedures and controls for protecting materials and construction from water absorption and damage and mold.
- F. Dust Control Plan: Submit coordination drawing and narrative that indicates the dust control measures proposed for use, proposed locations and proposed time frame for their operation. Include the following:
 - 1. Locations of dust-control partitions at each phase of work.
 - 2. Waste-handling procedures.
 - 3. Other dust control measures.

1.5 QUALITY ASSURANCE

- A. Electric Service: Comply with NECA, NEMA and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.
- B. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.
- C. Accessible Temporary Egress: Comply with applicable provisions in the United States Access Boards ADA-ABA Accessibility Guidelines and ICC/ANSI A117.1.

1.6 PROJECT CONDITIONS

- A. Temporary Use of Permanent Facilities: Engage Installer of each permanent service to assume responsibility for operation, maintenance and protection of each permanent service during its use as a construction facility before Owner's acceptance, regardless of previously assigned responsibilities.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Chain-Link Fencing: Minimum 2-inch, 0.148-inch-thick, galvanized-steel, chain-link fabric fencing; minimum 6 feet-high with galvanized-steel pipe posts; minimum

2-3/8-inch-OD line posts and 2-7/8-inch-OD corner and pull posts, with 1-5/8-inch-OD top rails. Install gates as required for construction access.

- B. The temporary construction fencing is to be supplied and installed by the Contractor.
- C. Dust-Control Adhesive Surface Walk-Off Mats: Provide mats minimum 36-inches by 60-inches.

2.2 TEMPORARY FACILITIES

- A. Field Offices, General: Prefabricated or mobile units with serviceable finishes, temperature controls and foundations adequate for normal loading.
- B. Common-Use Field Office: At the contractor's option; supply a unit of sufficient size to accommodate needs of Owner, Architect and Construction personnel office activities and to accommodate Project meetings specified in other Division 01 Sections. Keep office clean and orderly. Furnish and equip offices as follows:
 - 1. Furniture required for Project-site documents including file cabinets, plan tables, plan racks and bookcases.
 - 2. Conference room of sufficient size to accommodate meetings of 10-individuals. Provide electrical power service and 120-V ac duplex receptacles, with no less than one receptacle on each wall. Furnish room with conference table, chairs and 4-foot-square tack and marker boards.
 - 3. Drinking water and private toilet.
 - 4. Heating and cooling equipment necessary to maintain a uniform indoor temperature of 68 to 72 deg F.
 - 5. Lighting fixtures capable of maintaining average illumination of 20 fc at desk height.
 - 6. Contractor will be responsible for payment of all utilities needed for office set-up at the Project.
- C. Storage and Fabrication Sheds: Provide sheds sized, furnished and equipped to accommodate materials and equipment for construction operations.
 - 1. Store combustible materials apart from building.

2.3 EQUIPMENT

- A. Fire Extinguishers: Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.

PART 3 - EXECUTION

3.1 TEMPORARY FACILITIES, GENERAL

- A. Conservation: Coordinate construction and use of temporary facilities with consideration given to conservation of energy, water and materials. Coordinate use of temporary utilities to minimize waste.

3.2 INSTALLATION, GENERAL

- A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the work. Relocate and modify facilities as required by progress of the work.
 - 1. Locate facilities to limit site disturbance as specified in Section 01 10 00 "Summary."
- B. Provide each facility ready for use when needed to avoid delay. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

3.3 TEMPORARY UTILITY INSTALLATION

- A. General: Install temporary service or connect to existing service.
 - 1. Arrange with utility company, Owner and existing users for time when service can be interrupted, if necessary, to make connections for temporary services.
- B. Water Service: Install water service and distribution piping in sizes and pressures adequate for construction.
- C. Sanitary Facilities: Provide temporary toilets, wash facilities and drinking water for use of construction personnel. Comply with requirements of authorities having jurisdiction for type, number, location, operation and maintenance of fixtures and facilities.
- D. Temporary Heating and Cooling: Provide temporary heating and cooling required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of low temperatures or high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed.
- E. Electric Power Service: Provide electric power service and distribution system of sufficient size, capacity and power characteristics required for construction operations.
 - 1. Install electric power service overhead unless otherwise available and agreed by the owner.
- F. Lighting: Provide temporary lighting with local switching that provides adequate illumination for construction operations, observations, inspections and traffic conditions.

1. Install and operate temporary lighting that fulfills security and protection requirements without operating entire system.
- G. Telephone Service: Provide temporary telephone service in common-use facilities for use by all construction personnel. Install WiFi cell phone access equipment and one land-based telephone line for each field office.
1. At each telephone, post a list of important telephone numbers.
 - a. Police and fire departments.
 - b. Ambulance service.
 - c. Contractors home office.
 - d. Contractors emergency after-hours telephone number.
 - e. Architects office.
 - f. Engineers offices.
 - g. Owners office.
 - h. Principal Subcontractors field and home offices.

3.4 SUPPORT FACILITIES INSTALLATION

- A. General: Comply with the following:
1. Provide construction for temporary offices, shops and sheds located within construction area or within 30-feet of building lines that is non-combustible according to ASTM E 136. Comply with NFPA 241.
 2. Maintain support facilities until Architect schedules Substantial Completion inspection. Remove before Substantial Completion. Personnel remaining after Substantial Completion will be permitted to use permanent facilities, under conditions acceptable to Owner.
- B. Traffic Controls: Comply with requirements of authorities having jurisdiction.
1. Protect existing site improvements to remain including curbs, pavement and utilities.
 2. Maintain access for fire-fighting equipment and access to fire hydrants.
- C. Waste Disposal Facilities: Comply with requirements specified in Section 01 74 19 "Construction Waste Management and Disposal."
- D. Waste Disposal Facilities: Provide waste-collection containers in sizes adequate to handle waste from construction operations. Comply with requirements of authorities having jurisdiction. Comply with progress cleaning requirements in Section 01 73 00 "Execution."
- E. Project Sign: Provide (2) Project signs. Unauthorized signs are not permitted.
1. Project identification sign:
 - a. Project sign to be 4-feet 0-inches x 8-feet 0-inches, post mounted.
 - b. Architect to provide graphics to the Contractor that is to be used on sign, as shown at the end of this section.

- c. Location to be selected by Architect.
 - d. Installation to be by the Contractor.
- 2. Temporary Signs: Provide other signs as indicated and as required to inform public and individuals seeking entrance to Project.
 - a. Provide temporary, directional signs for construction personnel and visitors.
- 3. Maintain and touch up signs so they are legible at all times.
- F. Lifts and Hoists: Provide facilities necessary for hoisting materials.
 - 1. Truck cranes and similar devices used for hoisting materials are considered "tools and equipment" and not temporary facilities.

3.5 SECURITY AND PROTECTION FACILITIES INSTALLATION

- A. Environmental Protection: Provide protection, operate temporary facilities and conduct construction as required to comply with environmental regulations and that minimize possible air, waterway and subsoil contamination or pollution or other undesirable effects.
 - 1. Comply with work restrictions specified in Section 01 10 00 "Summary."
- B. Pest Control: Engage pest-control service to recommend practices to minimize attraction and harboring of rodents, roaches and other pests and to perform extermination and control procedures at regular intervals so Project will be free of pests and their residues at Substantial Completion. Perform control operations lawfully, using materials approved by authorities having jurisdiction.
- C. Barricades, Warning Signs and Lights: Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.
- D. Temporary Enclosures: Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations and similar activities. Provide temporary weathertight enclosure for building exterior.
- E. Temporary Fire Protection: Install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241; manage fire-prevention program.
 - 1. Prohibit smoking in construction areas. Comply with additional limits on smoking specified in other sections.
 - 2. Supervise welding operations, combustion-type temporary heating units and similar sources of fire ignition according to requirements of authorities having jurisdiction.
 - 3. Develop and supervise an overall fire-prevention and protection program for personnel at Project site. Review needs with local fire department and establish procedures to be followed. Instruct personnel in methods and procedures. Post warnings and information.

3.6 MOISTURE AND MOLD CONTROL

- A. Contractors Moisture-Protection Plan: Describe delivery, handling, storage, installation and protection provisions for materials subject to water absorption or water damage.
 - 1. Indicate procedures for discarding water-damaged materials, protocols for mitigating water intrusion into completed work and replacing water-damaged work.
 - 2. Indicate methods to be used to avoid trapping water in finished work.
- B. Exposed Construction Period: Before installation of weather barriers, when materials are subject to wetting and exposure and to airborne mold spores, protect as follows:
 - 1. Protect porous materials from water damage.
 - 2. Protect stored and installed material from flowing or standing water.
 - 3. Keep porous and organic materials from coming into prolonged contact with concrete.
 - 4. Remove standing water from decks.
 - 5. Keep deck openings covered or dammed.
- C. Partially Enclosed Construction Period: After installation of weather barriers but before full enclosure and conditioning of building, when installed materials are still subject to infiltration of moisture and ambient mold spores, protect as follows:
 - 1. Do not load or install drywall or other porous materials or components or items with high organic content into partially enclosed building.
 - 2. Keep interior spaces reasonably clean and protected from water damage.
 - 3. Periodically collect and remove waste containing cellulose or other organic matter.
 - 4. Discard or replace water-damaged material.
 - 5. Do not install material that is wet.
 - 6. Discard and replace stored or installed material that begins to grow mold.
 - 7. Perform work in a sequence that allows wet materials adequate time to dry before enclosing the material in gypsum board or other interior finishes.
- D. Controlled Construction Period: After completing and sealing of the building enclosure but prior to the full operation of permanent HVAC systems, maintain as follows:
 - 1. Control moisture and humidity inside building by maintaining effective dry-in conditions.
 - 2. Use temporary or permanent HVAC system to control humidity within ranges specified for installed and stored materials.

3.7 OPERATION, TERMINATION AND REMOVAL

- A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse limit availability of temporary facilities to essential and intended uses.
- B. Maintenance: Maintain facilities in good operating condition until removal.

1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation and similar facilities on a 24-hour basis where required to achieve indicated results and to avoid possibility of damage.
- C. Temporary Facility Changeover: Do not change over from using temporary security and protection facilities to permanent facilities until Substantial Completion.
- D. Termination and Removal: Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged work, clean exposed surfaces and replace construction that cannot be satisfactorily repaired.
1. Materials and facilities that constitute temporary facilities are property of Contractor. Owner reserves right to take possession of Project identification signs.
 2. Remove temporary roads and paved areas not intended for or acceptable for integration into permanent construction. Where area is intended for landscape development, remove soil and aggregate fill that do not comply with requirements for fill or subsoil. Remove materials contaminated with road oil, asphalt and other petrochemical compounds and other substances that might impair growth of plant materials or lawns. Repair or replace street paving, curbs and sidewalks at temporary entrances, as required by authorities having jurisdiction.
 3. At Substantial Completion, repair, renovate and clean permanent facilities used during construction period. Comply with final cleaning requirements specified in Section 017700 "Closeout Procedures."

END OF SECTION 015000

SECTION 015713 - TEMPORARY EROSION AND SEDIMENT CONTROL

PART 1 GENERAL

1.01 SECTION INCLUDES

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

1.02 RELATED REQUIREMENTS

- A. City of Gillette Standard Construction Specifications (2025)
- B. Section 311000 - Site Clearing
- C. Section 312201 - Grading
- D. Section 312316.13 - Trenching
- E. Section 313700 - Riprap
- F. Section 321123 - Aggregate Base Courses

1.03 REFERENCE STANDARDS

- A. WYPDES - Wyoming Pollutant Discharge Elimination System Program
- B. ASTM D4355/D4355M - Standard Test Method for Deterioration of Geotextiles by Exposure to Light, Moisture, and Heat in a Xenon Arc-Type Apparatus.
- C. ASTM D4491/D4491M - Standard Test Methods for Water Permeability of Geotextiles by Permittivity.
- D. ASTM D4533/D4533M - Standard Test Method for Trapezoid Tearing Strength of Geotextiles.
- E. ASTM D4632/D4632M - Standard Test Method for Grab Breaking Load and Elongation of Geotextiles.
- F. ASTM D4751 - Standard Test Method for Determining Apparent Opening Size of a Geotextile.
- G. ASTM D4873/D4873M - Standard Guide for Identification, Storage, and Handling of Geosynthetic Rolls and Samples.

1.04 PERFORMANCE REQUIREMENTS

- A. The Contractor shall comply with the requirements of the WYPDES for erosion and sedimentation control and the associated storm water permitting.
- B. Develop and follow an Erosion and Sedimentation Prevention Plan and submit periodic inspection reports.

- C. Do not begin clearing, grading, or other work involving disturbance of ground surface cover until applicable permits have been obtained. The Contractor shall furnish all documentation required to obtain applicable permits.
- D. Timing: Put preventive measures in place as soon as possible after disturbance of surface cover and before precipitation occurs.
- E. Storm Water Runoff: Control increased storm water runoff due to disturbance of surface cover caused by construction activities for this project.
 - 1. Prevent runoff into storm and sanitary sewer systems, including open drainage channels, in excess of actual capacity or amount allowed by authorities having jurisdiction, whichever is less.
 - 2. Storm water Best Management Practices (BMPs) are required to withstand and function in storm events up to a 2-year / 24-hour storm.
- F. Erosion On Site: Minimize wind, water, and vehicular erosion of soil on the project site due to construction activities for this project.
 - 1. Control movement of sediment and soil from temporary stockpiles of soil.
 - 2. Prevent development of ruts due to equipment and vehicular traffic.
 - 3. If erosion occurs due to non-compliance with these requirements, restore eroded areas at no cost to Owner.
- G. Erosion Off Site: Prevent erosion of soil and deposition of sediment on other properties caused by water leaving the project site due to construction activities for this project.
 - 1. Prevent windblown soil from leaving the project site.
 - 2. Prevent tracking of mud onto public roads outside site.
 - 3. Prevent mud and sediment from flowing onto sidewalks and pavements.
 - 4. If erosion occurs due to noncompliance with these requirements, restore eroded areas at no cost to Owner.
- H. Sedimentation of Waterways On Site: Prevent sedimentation of waterways on the project site, including rivers, streams, lakes, ponds, open drainage ways, storm sewers, and sanitary sewers.
 - 1. If sedimentation occurs, install or correct preventive measures immediately at no cost to Owner and remove deposited sediments. Contractor shall comply with all requirements of the jurisdictional authorities.
 - 2. If sediment basins are used as temporary preventive measures, the Contractor shall pump dry and remove deposited sediment after each storm.
- I. Sedimentation of Waterways Off Site: Prevent sedimentation of waterways off the project site, including rivers, streams, lakes, ponds, open drainage ways, storm sewers, and sanitary sewers.
 - 1. If sedimentation occurs, install or correct preventive measures immediately at no cost to Owner and remove deposited sediments. Contractor shall comply with all requirements of the jurisdictional authorities.
- J. Open Water: Prevent standing water that could become stagnant.
- K. Maintenance: Maintain temporary preventive measures until permanent measures have been established.

1.05 SUBMITTALS

- A. Submittals are required for all materials and shall be in accordance with these Specifications.

- B. Erosion and Sedimentation Control Plan:
1. Obtain approval of the Erosion and Sedimentation Control Plan by Owner.
 2. Obtain approval of the Erosion and Sedimentation Control Plan by authorities having jurisdiction. Contractor shall submit a copy of the approved City of Gillette Storm Water Permit, and if applicable the State of Wyoming Stormwater Permit Notice of Intent.
 3. Submit the Erosion and Sedimentation Control Plan to Architect/Engineer no less than 7 days prior to anticipated start of clearing, grading, or other work involving disturbance of ground surface cover.
- C. Certificate: Mill certificate for silt fence fabric attesting that fabric and factory seams comply with specified requirements, signed by legally authorized official of manufacturer; indicate actual minimum average roll values; identify fabric by roll identification numbers.
- D. Inspection Reports: The Contractor shall maintain inspection reports which identify each preventive measure, indicate conditions, and specify maintenance or repair required and accomplished. Copies of the inspection reports shall be provided to the Architect/Engineer upon request.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Wattle: Weed free straw, compost, excelsior, or coconut fiber encased in polypropylene netting with a minimum diameter of 12 inches and a standard length of 10 feet.
- B. Wattle Stakes: 2 inch x 2 inch wood stake with a minimum length of 2 feet.
- C. Silt Fence Fabric: Polypropylene geotextile resistant to common soil chemicals, mildew, and insects; non-biodegradable; in longest lengths possible; fabric including seams with the following minimum average roll lengths:
1. Average Opening Size: 20-50 mm U.S. Std. Sieve, maximum, when tested in accordance with ASTM D4751.
 2. Permittivity: 0.05 sec^{-1} , minimum, when tested in accordance with ASTM D4491/D4491M.
 3. Ultraviolet Resistance: Retaining at least 80 percent of tensile strength, when tested in accordance with ASTM D4355/D4355M after 500 hours exposure.
 4. Tensile Strength: 100 pounds-force, minimum, in cross-machine direction; 124 pounds-force, minimum, in machine direction, when tested in accordance with ASTM D4632/D4632M.
 5. Elongation: 15 percent, when tested in accordance with ASTM D4632/D4632M.
 6. Tear Strength: 50 lb-f, minimum, when tested in accordance with ASTM D4533/D4533M.
 7. Color: Manufacturer's standard, with embedment and fastener lines preprinted.
- D. Silt Fence Stakes: 1.5 inch x 1.5 inch wood stake with a minimum length of 4 feet.
- E. Erosion Control Blanket: Shall be made of 100% biodegradable straw encased in netting on both sides that is sewn together with cotton thread. The blanket shall come in minimum widths of 6 feet and weigh at least 0.5 lbs per square yard. The blanket shall have a life of at least 12 months.
- F. Gravel: See Section 321123.
- G. Riprap: See Section 313700.

PART 3 EXECUTION

3.01 EXAMINATION

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

3.02 PREPARATION

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

3.03 SCOPE OF PREVENTIVE MEASURES

- A. In all cases, if permanent erosion resistant measures have been installed temporary preventive measures are not required.
- B. Construction Entrances: Traffic-bearing aggregate surface.
 - 1. Width: As required; 12 feet, minimum.
 - 2. Length: 50 feet, minimum.
 - 3. Provide at each construction entrance from public right-of-way.
 - 4. Where necessary to prevent tracking of mud onto right-of-way, provide wheel washing area out of the direct traffic lane with a drain into a sediment trap or basin.
- C. Linear Sediment Barriers: Made of silt fences or wattles.
 - 1. Provide linear sediment barriers:
 - a. Along downhill perimeter edge of disturbed areas, including soil stockpiles.
 - b. Along the toe of cut and fill slopes.
 - c. Perpendicular to flow across the bottom of existing and new drainage channels and swales that traverse disturbed areas or carry runoff from disturbed areas; space at maximum of 200 feet apart.
 - d. Across the entrances to culverts that receive runoff from disturbed areas.
 - 2. Maximum space between sediment barriers shall be based on the maximum slope above the barrier:
 - a. Slope of <2%: 100 feet.
 - b. Slope 2% - 5%: 75 feet.
 - c. Slope 5% - 10%: 50 feet.
 - d. Slope 10% - 20%: 25 feet.
 - e. Slope >20%: 15 feet.
- D. Storm Drain Inlet Protection: Protect each curb or other storm drain inlet with an approved sediment trap. Provide drop inlet sediment traps where specified on the drawings or required by jurisdictional authorities.
- E. Temporary Splash Pads: Stone aggregate over filter fabric sized to suit application. Also provide at downspout outlets and storm water outlets.
- F. Soil Stockpiles: Shall be covered or protected with soil stabilization measures and a temporary perimeter sediment barrier.
 - 1. Temporary vegetation should be considered for topsoil piles that will be stockpiled for extended periods.

3.04 INSTALLATION

- A. Traffic-Bearing Aggregate Surface:
 - 1. Place geotextile fabric full width and length, with minimum 12 inch overlap at joints.
 - 2. Place and compact at least 8 inches of 2 - 4 inch diameter open graded stone.

B. Silt Fences:

1. Store and handle fabric in accordance with ASTM D4873/D4873M.
2. Install with top of fabric at nominal height and embedment per recommended best practices for this BMP .
3. Do not splice fabric width; minimize splices in fabric length; splice at post only, overlapping at least 18 inches, with extra post.
4. Fasten fabric to wood posts per the standards and recommended means and methods of the fabric manufacturer.

C. Wattles:

1. Install wattles in continuous rows with end abutting tightly, or slightly overlapping.
2. Entrench wattles per recommended best practices for this BMP to prevent erosion.
3. Set wood stakes 18 inches on center.

3.05 MAINTENANCE

A. Inspect preventive measures weekly, within 24 hours after the end of any storm that produces 0.5 inches or more rainfall at the project site, and daily during prolonged rainfall.

B. Repair deficiencies immediately.

C. Silt Fences:

1. Promptly replace fabric that deteriorates unless need for fence has passed.
2. Remove silt deposits that exceed one-third (1/3) the height of the fence.
3. Repair fences that are undercut by runoff or otherwise damaged.

D. Wattles

1. Promptly replace wattles that deteriorate unless need for wattle has passed.
2. Remove silt deposits.
3. Repair wattles that are undercut by runoff or otherwise damaged.

E. Clean out temporary sediment control structures weekly and relocate soil on site.

F. Place sediment in appropriate locations on site; do not remove from site.

3.06 CLEAN UP

A. Remove temporary measures after permanent measures have been installed, unless permitted to remain by Architect/Engineer.

B. Clean out temporary sediment control structures that are to remain as permanent measures.

C. Where removal of temporary measures would leave exposed soil, shape surface to an acceptable grade and finish to match adjacent ground surfaces.

END OF SECTION 015713

016000 - SUBSTITUTION REQUEST FORM

Note: Product substitution requests must be received by the Architect ten (10) calendar days prior to the bid date to be considered. Requests received after this time will not be considered.

ONE SUBSTITUTION PER FORM. FILL IN ALL BLANKS.

PROJECT NO.: _____.

PROJECT TITLE: _____.

We hereby submit for your review the following substitution for the following specified material for the project referenced above.

<u>Section</u>	<u>Page</u>	<u>Specified Material</u>
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_____	_____	_____.
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Proposed Substitution:

_____.

Attach duplicate copies of this form, complete technical data, specifications, colors, laboratory tests and any other information applicable to the proposed substitution, see Section 01 60 00 “.

Include complete information on changes to drawings and/or specifications which the proposed substitution will require for its proper installation.

1. Does the substitution affect dimensions shown or indicated on drawings?

2. Will the undersigned pay for any changes to the building design, including engineering and detailing costs caused or required by the requested substitution?

3. What effect does the proposed substitution have on other trades?

4. What are the differences between the proposed substitution and the item/product/material specified?

5. Guarantees/Warranties of the proposed substitution and specified item/product/material are:
____ Same.
____ Different (Explain).

(Attach copies of Guarantees/Warranties).
6. Will the proposed substitution have any effect on the contract time?
____ No.
____ Yes (Explain)

7. Will the proposed substitution have any effect on the contract price?

☐ No.
☐ Yes (Explain).

This request is accompanied by a self-addressed, stamped envelope.

The undersigned states that the function, appearance and quality are equivalent or superior to the specified item/product/material.

All requests for substitutions must be submitted through and approved by the Contractor.

Submitted By:

Signature

Type or Print Name & Title

Firm

Address

Date

Phone

E-mail

For Use by Architect/Engineer:

☐ Received to Late to Review.
☐ Incomplete Submittal.
☐ Not Accepted.
☐ Approved, Except as Noted:

Signature

Consultant

Date

Signature

Plan One / Architects
Architect

Date

SECTION 016000 - PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for selection of products for use in Project; product delivery, storage and handling; manufacturers standard warranties on products; special warranties and comparable products.
- B. Related Requirements:
 - 1. Section 012500 "Substitution Procedures" for requests for substitutions.
 - 2. Section 014200 "References" for applicable industry standards for products specified.
 - 3. Section 016000 "Product Requirements" for Product Substitution Request Form, located at the end of this section.
 - 4. Divisions 2 through 26 Sections for specific requirements for warranties on products and installations specified to be warranted.

1.3 DEFINITIONS

- A. Products: Items obtained for incorporating into the work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system" and terms of similar intent.
 - 1. Named Products: Items identified by manufacturers product name, including make or model number or other designation shown or listed in manufacturers published product literature that is current as of date of the Contract Documents.
 - 2. New Products: Items that have not previously been incorporated into another project or facility. Products salvaged or recycled from other projects are not considered new products.
 - 3. Comparable Product: Product that is demonstrated and approved by Architect through submittal process to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance and other characteristics that equal or exceed those of specified product.

- B. Basis-of-Design Product Specification: A specification in which a single manufacturers product is named and accompanied by the words "basis-of-design product," including make or model number or other designation. In addition to the basis-of-design product description, product attributes and characteristics may be listed to establish the significant qualities related to type, function, in-service performance and physical properties, weight, dimension, durability, visual characteristics and other special features and requirements for purposes of evaluating comparable products of additional manufacturers named in the specification.
- C. Subject to Compliance with Requirements: Where the phrase "subject to compliance with requirements" introduces a product selection procedure in an individual specification section, provide products qualified under the specified product procedure. In the event that a named product or product by a named manufacturer does not meet the other requirements of the specifications, select another named product or product from another named manufacturer that does meet the requirements of the specifications. Submit a comparable product request, if applicable.

1.4 ACTION SUBMITTALS

- A. Comparable Product Request Submittal: Submit request for consideration of each comparable product. Identify basis-of-design product or fabrication or installation method to be replaced. Include specification section number and title and drawing numbers and titles.
 - 1. Include data to indicate compliance with the requirements specified in "Comparable Products" Article.
 - 2. Architects Action: If necessary, Architect will request additional information or documentation for evaluation within seven-days of receipt of a comparable product request. Architect will notify Contractor of approval or rejection of proposed comparable product request within 15-days of receipt of request or seven-days of receipt of additional information or documentation, whichever is later.
 - a. Form of Architects Approval of Submittal: As specified in Section 01 33 00 "Submittal Procedures."
 - b. Use product specified if Architect does not issue a decision on use of a comparable product request within time allocated.
 - 3. Completed List: Within thirty (30)-days after date of commencement of the work, submit three (3) copies of completed product list. Include a written explanation for omissions of data and for variations from Contract requirements.
- B. Basis-of-Design Product Specification Submittal: Comply with requirements in Section 013300 "Submittal Procedures." Show compliance with requirements.

1.5 QUALITY ASSURANCE

- A. Compatibility of Options: If Contractor is given option of selecting between two or more products for use on Project, select product compatible with products previously selected, even if previously selected products were also options.

1. Each Contractor is responsible for providing products and construction methods compatible with products and construction methods of other Contractors.
 2. If a dispute arises between Contractors over concurrently selectable but incompatible products, Architect will determine which products shall be used.
- B. Identification of Products: Except for required labels and operating data, do not attach or imprint manufacturer or product names or trademarks on exposed surfaces of products or equipment that will be exposed to view in occupied spaces or on the exterior.
1. Labels: Locate required product labels and stamps on a concealed surface or, where required for observation following installation, on a visually accessible surface that is not conspicuous.
 2. Equipment Nameplates: Provide a permanent nameplate on each item of service-connected or power-operated equipment. Locate on a visually accessible but inconspicuous surface. Include information essential for operation, including the following:
 - a. Name of product and manufacturer.
 - b. Model and serial number.
 - c. Capacity.
 - d. Speed.
 - e. Ratings.
 3. See individual identification sections in Division 26 for additional identification requirements.

1.6 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Deliver, store and handle products using means and methods that will prevent damage, deterioration and loss, including theft and vandalism. Comply with manufacturers written instructions.
- B. Delivery and Handling:
1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
 2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged or sensitive to deterioration, theft and other losses.
 3. Deliver products to Project site in an undamaged condition in manufacturers original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting and installing.
 4. Inspect products on delivery to determine compliance with the Contract Documents and to determine that products are undamaged and properly protected.
- C. Storage:
1. Store products to allow for inspection and measurement of quantity or counting of units.

2. Store materials in a manner that will not endanger Project structure.
3. Store products that are subject to damage by the elements, under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation.
4. Protect foam plastic from exposure to sunlight, except to extent necessary for period of installation and concealment.
5. Comply with product manufacturers written instructions for temperature, humidity, ventilation and weather-protection requirements for storage.
6. Protect stored products from damage and liquids from freezing.
7. Provide a secure location and enclosure at Project site for storage of materials and equipment by Owners construction forces. Coordinate location with Owner.

1.7 PRODUCT WARRANTIES

- A. Warranties specified in other sections shall be in addition to and run concurrent with, other warranties required by the Contract Documents. Manufacturers disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.
 1. Manufacturers Warranty: Written warranty furnished by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.
 2. Special Warranty: Written warranty required by the Contract Documents to provide specific rights for Owner.
- B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution.
 1. Manufacturers Standard Form: Modified to include Project-specific information and properly executed.
 2. Specified Form: When specified forms are included with the specifications, prepare a written document using indicated form properly executed.
 3. See other sections for specific content requirements and particular requirements for submitting special warranties.
- C. Submittal Time: Comply with requirements in Section 01 77 00 "Closeout Procedures."

PART 2 - PRODUCTS

2.1 PRODUCT SELECTION PROCEDURES

- A. General Product Requirements: Provide products that comply with the Contract Documents, are undamaged and unless otherwise indicated are new at time of installation.
 1. Provide products complete with accessories, trim, finish, fasteners and other items needed for a complete installation and indicated use and effect.

2. Standard Products: If available and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
3. Owner reserves the right to limit selection to products with warranties meeting requirements of the Contract Documents.
4. Where products are accompanied by the term "as selected," Architect will make selection.
5. Descriptive, performance and reference standard requirements in the specifications establish salient characteristics of products.
6. Or Equal: For products specified by name and accompanied by the term "or equal," or "or approved equal," or "or approved," comply with requirements in "Comparable Products" Article to obtain approval for use of an unnamed product.
 - a. Submit additional documentation required by Architect order to establish equivalency of proposed products. Evaluation of "or equal" product status is by the Architect, whose determination is final.

B. Product Selection Procedures:

1. Product: Where specifications name a single product and manufacturer, provide the named product that complies with requirements.
2. Manufacturer/Source: Where specifications name a single manufacturer or source, provide a product by the named manufacturer or source that complies with requirements.
3. Products: Where specifications include a list of names of both products and manufacturers, provide one of the products listed that complies with requirements.
4. Manufacturers: Where specifications include a list of manufacturers names, provide a product by one of the manufacturers listed that complies with requirements.
5. Basis-of-Design Product: Where specifications name a product and include a list of manufacturers, provide the specified product or a comparable product by one of the other named manufacturers. Drawings and specifications indicate sizes, profiles, dimensions and other characteristics that are based on the product named. Comply with provisions in Part 2 "Comparable Products" Article for consideration of an unnamed product by the other named manufacturers.
6. Visual Selection Specification: Where specifications include the phrase "as selected from manufacturers colors, patterns, textures" or a similar phrase, select a product that complies with other specified requirements.
 - a. Standard Range: Where specifications include the phrase "standard range of colors, patterns, textures" or similar phrase, Architect will select color, pattern, density or texture from manufacturers product line that does not include premium items.
 - b. Full Range: Where specifications include the phrase "full range of colors, patterns, textures" or similar phrase, Architect will select color, pattern, density or texture from manufacturers product line that includes both standard and premium items.

- C. Visual Matching Specification: Where specifications require "match Architects sample," provide a product that complies with requirements and matches Architects sample. Architects decision will be final on whether a proposed product matches.
 - 1. If no product available within specified category matches and complies with other specified requirements, comply with requirements in Section 01 25 00 "Substitution Procedures" for proposal of product.

2.2 PRODUCT SUBSTITUTIONS

- A. Timing: To obtain approval to use unspecified materials, products, equipment or services, Bidders, Contractor, Subcontractors, Suppliers, Manufacturers, etc.) shall submit written requests at least ten (10) calendar days prior to bidding. Requests received after this time will not be considered.
- B. Conditions: Architect will consider Contractors request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record non-compliance with these requirements:
 - 1. Requested substitution offers Owner a substantial advantage in cost, time, energy conservation or other considerations, after deducting additional responsibilities Owner must assume. Owners additional responsibilities may include compensation to Architect for redesign and evaluation services, increased cost of other Construction by Owner and similar considerations.
 - 2. Requested substitution does not require extensive revisions to the Contract Documents.
 - 3. Requested substitution is consistent with the Contract Documents and will produce indicated results.
 - 4. Substitution request is fully documented and properly submitted. See Substitution Request Form at the end of this section.
 - 5. Requested substitution will not adversely affect Contractors Construction Schedule.
 - 6. Requested substitution has received necessary approvals of authorities having jurisdiction.
 - 7. Requested substitution is compatible with other portions of the work.
 - 8. Requested substitution has been coordinated with other portions of the work.
 - 9. Requested substitution provides specified warranty.
 - 10. If requested substitution involves more than one Contractor, requested substitution has been coordinated with other portions of the work, is uniform and consistent, is compatible with other products and is acceptable to all Contractors involved.

2.3 COMPARABLE PRODUCTS

- A. Conditions for Consideration of Comparable Products: Architect will consider Contractors request for comparable product when the following conditions are satisfied. If the following conditions are not satisfied, Architect may return requests without action, except to record non-compliance with these requirements:

1. Evidence that proposed product does not require revisions to the Contract Documents, is consistent with the Contract Documents, will produce the indicated results and is compatible with other portions of the work. Detailed comparison of significant qualities of proposed product with those named in the specifications. Significant product qualities include attributes such as type, function, in-service performance and physical properties, weight, dimension, durability, visual characteristics and other specific features and requirements.
 2. Evidence that proposed product provides specified warranty.
 3. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners, if requested.
 4. Samples, if requested.
- B. Submittal Requirements: Approval by the Architect of Contractors request for use of comparable product is not intended to satisfy other submittal requirements. Comply with specified submittal requirements.

PART 3 - EXECUTION (Not Used)

END OF SECTION 01600

SECTION 017123 - FIELD ENGINEERING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Field engineering services by Contractor.
- B. Land surveying services by Contractor.

1.02 DESCRIPTION OF SERVICES

- A. Specific services listed in this section are in addition to, and do not supersede, general Execution and Closeout Requirements.
- B. Sole responsibility for establishing all locations, dimensions and levels of items of work.
- C. Sole responsibility for provision of all materials required to establish and maintain benchmarks and control points, including batter boards, grade stakes, structure, and pipeline elevation stakes, and other items.
- D. Provision of facilities and assistance necessary for Architect/Engineer to check lines and grade points placed by Contractor.
- E. Preparation and maintenance of daily reports of activity on the work. Submission of reports containing key progress indicators and job conditions to Architect/Engineer.
 - 1. Number of employees at the site.
 - 2. Number employees at the site for each of Contractor's subcontractors.
 - 3. Breakdown of employees by trades.
 - 4. Major equipment and materials installed as part of the work.
 - 5. Major construction equipment utilized.
 - 6. Location of areas in which construction was performed.
 - 7. Materials and equipment received.
 - 8. Work performed, including field quality control measures and testing.
 - 9. Weather conditions.
 - 10. Safety.
 - 11. Delays encountered, amount of delay incurred, and the reasons for the delay.
 - 12. Instructions received from Architect/Engineer or Owner, if any.
- F. Preparation and maintenance of professional-quality, accurate, well organized, legible notes of all measurements and calculations made while surveying and laying out the work.
- G. Prior to backfilling operations, surveying - locating, and recording on a copy of Contract Documents - an accurate representation of buried work and Underground Facilities encountered.

1.03 ADMINISTRATIVE REQUIREMENTS

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

1.04 QUALITY ASSURANCE

- A. Use adequate number of skilled and thoroughly-trained workers to perform the work of this section in a timely and comprehensive manner.

B. Minimum Accuracy

1. Control
 - a. Horizontal Closure: 1:10,000
 - b. Vertical Closure: 0.01 feet
2. Buildings, Structures, and Hardscapes
 - a. Horizontal Precision: 0.01 feet
 - b. Vertical Precision: 0.01 feet
3. Grading
 - a. Horizontal Precision: 0.25 feet
 - b. Vertical Precision: 0.04 feet
4. Utilities
 - a. Horizontal Precision: 0.10 feet
 - b. Vertical Precision: 0.04 feet

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify layout information shown on Drawings, in relation to the original site drawing and existing benchmarks. Notify Owner's Representative and Architect/Engineer of any discrepancies immediately in writing before proceeding to lay out the work. Locate and protect existing survey control monuments and benchmarks. Preserve permanent reference points during construction.
- B. Existing Utilities and Equipment: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework, investigate and verify existing conditions.

3.02 FIELD ENGINEERING

- A. Maintain field office files, drawings, specifications, and record documents.
- B. Coordinate field engineering services with Contractor's subcontractors, installers, and suppliers as appropriate.
- C. Prepare layout and coordination drawings for construction operations.
- D. Check and coordinate the work for conflicts and interferences, and immediately advise Architect/Engineer and Owner of all discrepancies of which Contractor is aware.
- E. Cooperate as required with Architect/Engineer and Owner in observing the work and performing field inspections.
- F. Review and coordinate work on a regular basis with shop drawings and Contractor's other submittals.
- G. Check the location, line and grade of all major elements as the work progresses. Notify the Architect/Engineer when deviations from required lines or grades exceed allowable tolerances. Include in such notifications a thorough explanation of the problem, and a proposed plan and schedule for remedying the deviation. Do not proceed with remedial work without Owner's concurrence of the remediation plan.
- H. Check all formwork, reinforcing, inserts, structural steel, bolts, sleeves, piping, other materials and equipment for compliance with shop drawings and Contract Documents requirements.

3.03 LAND SURVEYING

- A. Contractor is responsible for the restoration of all property corners and control monuments damaged or destroyed by construction related activities. All disturbed monuments must be replaced at Contractor's expense by a land surveyor licensed in the State of Wyoming and approved by the Architect/Engineer.

3.04 CONSTRUCTION SURVEYING

- A. General: Perform surveying as applicable to specific items necessary for proper execution of work.
 - 1. Alignment Staking: Provide stakes at 50 foot intervals on tangents and at 25 foot intervals on curves.
 - 2. Curb and Gutter: Provide offset stakes to the back of curb with an appropriate number of stakes to layout the line and grade of the curb. At a minimum the stakes shall include the beginning and end of all curve radii, any low or high point on the curb, and a maximum spacing of 25 feet.
 - 3. Structure: Provide stakes as directed by the Contractor for layout of structures. Stakes shall be checked prior to and during construction.
 - 4. Pipelines: Provide stakes as directed by the Contractor for layout of pipelines. Stakes shall be checked prior to and during construction.
 - 5. Site Utilities: Provide stakes as directed by the Contractor for layout of site utilities. Stakes shall be checked prior to and during construction.
 - 6. Grading: Provide grade stakes for subgrade and crushed base surfacing on a minimum 50 foot grid.
- B. Record Log: Maintain a log of layout control work. Record any deviations from required lines and levels. Include beginning and ending dates and times of surveys, weather conditions, name and duty of each survey party member, and types of instruments and tapes used.
- C. Use by the Architect/Engineer: The Architect/Engineer may at any time use line and grade points and markers established by the Contractor. The Contractor's surveys are a part of the work and may be checked by the Architect/Engineer at any time.

3.05 MACHINE CONTROL

- A. The Contractor may use GPS machine guidance construction for all, or part, of the dirt work.
- B. The Contractor must achieve the required accuracies when using GPS machine guidance construction methods.
 - 1. If accuracies cannot be met the contractor shall revert to conventional surveying methods.
 - 2. The Contractor shall provide the Architect/Engineer a work plan for using GPS machine guidance equipment.
 - a. Designate which portions of the contract will be done using GPS machine guidance and which portion will be done using conventional staking.
 - b. Provide qualifications of staff and field experience.
 - c. Describe site calibration procedures.
 - d. Describe the quality control procedures including checking periodic sensor calibration, mechanical calibration, blade wear, routine adjustments, and maintenance of equipment. Provide frequency and type of checks to be performed to ensure constructed grades conform with the plans.
- C. The Architect/Engineer will provide the Contractor with coordinates for the project control, Computer Aided Drafting (CAD) line work from the plans, and a digital terrain model (DTM) of the finished grade surface.

1. It is the responsibility of the Contractor to verify the accuracy of these submittals. Any errors or discrepancies shall be identified by the Contractor. No work shall be performed using GPS machine guidance equipment until the Architect/Engineer has provided a written resolution.

3.06 RECORDS

- A. Maintain at the site a complete and accurate log of control and survey work as it progresses.
 1. Organize and record survey data in accordance with recognized professional surveying standards, laws and regulations, and prevailing standards of practice in the State of Wyoming. Record Contractor's surveyor's original field notes, computations, and other surveying data in Contractor furnished hardbound field books. Contractor is solely responsible for completeness and accuracy of survey work, and completeness and accuracy of survey records, including field books. Survey records, including field books, may be rejected by Owner due to failure to organize and maintain survey records in a manner that allows reasonable and independent verification of calculations, and/or allows identification of elevations, dimensions, and grades of the work.
 2. Illegible notes or data, and erasures on any page of field books, are unacceptable. Do not submit copied notes or data. Corrections by ruling or lining out errors will be unacceptable unless initialed by the surveyor. Violation of these requirements may require resurveying the data questioned by Architect/Engineer.

END OF SECTION 017123

SECTION 017300 - EXECUTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this section.

1.2 SUMMARY

- A. Section includes general administrative and procedural requirements governing execution of the work including but not limited to the following:
 - 1. Construction layout.
 - 2. Installation of the work.
 - 3. Cutting and patching.
 - 4. Coordination of Owner-installed products.
 - 5. Progress cleaning.
 - 6. Starting and adjusting.
 - 7. Protection of installed construction.
 - 8. Correction of the work.
- B. Related Requirements:
 - 1. Section 011000 "Summary" for limits on use of Project site.
 - 2. Section 013300 "Submittal Procedures" for submitting surveys.
 - 3. Section 017700 "Closeout Procedures" Record Documents, recording of Owner-accepted deviations from indicated lines and levels, replacing defective work and final cleaning.

1.3 DEFINITIONS

- A. Cutting: Removal of in-place construction necessary to permit installation or performance of subsequent work.
- B. Patching: Fitting and repair work required to restore construction to original conditions after installation of subsequent work.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For land surveyor.
- B. Certificates: Submit certificate signed by land surveyor certifying that location and elevation of improvements comply with requirements.

- C. Cutting and Patching Plan: Submit plan describing procedures at least 10-days prior to the time cutting and patching will be performed. Include the following information:
1. Extent: Describe reason for and extent of each occurrence of cutting and patching.
 2. Changes to In-Place Construction: Describe anticipated results. Include changes to structural elements and operating components as well as changes in building appearance and other significant visual elements.
 3. Products: List products to be used for patching and firms or entities that will perform patching work.
 4. Dates: Indicate when cutting and patching will be performed.
 5. Utilities and Mechanical and Electrical Systems: List services and systems that cutting and patching procedures will disturb or affect. List services and systems that will be relocated and those that will be temporarily out of service. Indicate length of time permanent services and systems will be disrupted.
 - a. Include description of provisions for temporary services and systems during interruption of permanent services and systems.
- D. Landfill Receipts: Submit copy of receipts issued by a landfill facility, licensed to accept hazardous materials, for hazardous waste disposal.

1.5 QUALITY ASSURANCE

- A. Land Surveyor Qualifications: A professional land surveyor who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing land-surveying services of the kind indicated.
- B. Cutting and Patching: Comply with requirements for and limitations on cutting and patching of construction elements.
1. Structural Elements: When cutting and patching structural elements, notify Architect of locations and details of cutting and await directions from Architect before proceeding. Shore, brace and support structural elements during cutting and patching. Do not cut and patch structural elements in a manner that could change their load-carrying capacity or increase deflection.
 2. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety. Operational elements include the following:
 - a. Primary operational systems and equipment.
 - b. Air or smoke barriers.
 - c. Plumbing piping systems.
 - d. Mechanical systems piping and ducts.
 - e. Control systems.
 - f. Communication systems.
 - g. Fire-detection and alarm systems.
 - h. Electrical wiring systems.

3. Other Construction Elements: Do not cut and patch other construction elements or components in a manner that could change their load-carrying capacity that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety. Other construction elements include but are not limited to the following:
 - a. Water, moisture or vapor barriers.
 - b. Membranes and flashings.
 - c. Equipment supports.
 - d. Piping, ductwork, vessels and equipment.
 - e. Noise and vibration-control elements and systems.
 4. Visual Elements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch exposed construction in a manner that would, in Architects opinion, reduce the buildings aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.
- C. Manufacturers Installation Instructions: Obtain and maintain on-site manufacturers written recommendations and instructions for installation of products and equipment.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Existing Conditions: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning site work, investigate and verify the existence and location of underground utilities and other construction affecting the work.
- B. Existing Utilities: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning site work, investigate and verify the existence and location of underground utilities and other construction affecting the work.
 1. Before construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer and water-service piping, underground electrical services and other utilities.
 2. Furnish location data for work related to Project that must be performed by public utilities serving Project site.
- C. Examination and Acceptance of Conditions: Before proceeding with each component of the work, examine substrates, areas and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.

1. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
 2. Examine walls, floors and roofs for suitable conditions where products and systems are to be installed.
 3. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
- D. Written Report: Where a written report listing conditions detrimental to performance of the work is required by other sections include the following:
1. Description of the work.
 2. List of detrimental conditions, including substrates.
 3. List of unacceptable installation tolerances.
 4. Recommended corrections.
- E. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the work indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Existing Utility Information: Furnish information to Owner that is necessary to adjust, move or relocate existing utility structures, utility poles, lines, services or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.
- B. Field Measurements: Take field measurements as required to fit the work properly. Recheck measurements before installing each product. Where portions of the work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the work.
- C. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on drawings.
- D. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents caused by differing field conditions outside the control of Contractor, submit a request for information to Architect according to requirements in Section 013100 "Project Management and Coordination."

3.3 CONSTRUCTION LAYOUT

- A. Verification: Before proceeding to lay out the work, verify layout information shown on Drawings. If discrepancies are discovered, notify Architect promptly.

3.4 INSTALLATION

- A. General: Locate the work and components of the work accurately, in correct alignment and elevation, as indicated.

1. Make vertical work plumb and make horizontal work level.
 2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
 3. Conceal pipes, ducts and wiring in finished areas unless otherwise indicated.
 4. Maintain minimum headroom clearance of 8-feet in occupied spaces and in unoccupied spaces.
- B. Comply with manufacturers written instructions and recommendations for installing products in applications indicated.
- C. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.
- D. Conduct construction operations so no part of the work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.
- E. Sequence the work and allow adequate clearances to accommodate movement of construction items on site and placement in permanent locations.
- F. Tools and Equipment: Where possible, select tools or equipment that minimize production of excessive noise levels.
- G. Templates: Obtain and distribute to the parties involved templates for work specified to be factory prepared and field installed. Check shop drawings of other portions of the work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.
- H. Attachment: Provide blocking and attachment plates and anchors and fasteners of adequate size and number to securely anchor each component in place, accurately located and aligned with other portions of the work. Where size and type of attachments are not indicated, verify size and type required for load conditions.
1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Architect.
 2. Allow for building movement, including thermal expansion and contraction.
 3. Coordinate installation of anchorages. Furnish setting drawings, templates and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts and items with integral anchors that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.
- I. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.
- J. Hazardous Materials: Use products, cleaners and installation materials that are not considered hazardous.
- K. Repair or remove and replace damaged, defective or non-conforming work.

1. Comply with Section 017700 "Closeout Procedures" for repairing or removing and replacing defective work.

3.5 CUTTING AND PATCHING

- A. Cutting and Patching, General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time and complete without delay.
 1. Cut in-place construction to provide for installation of other components or performance of other construction and subsequently patch as required to restore surfaces to their original condition.
- B. Existing Warranties: Remove, replace, patch and repair materials and surfaces cut or damaged during installation or cutting and patching operations, by methods and with materials so as not to void existing warranties.
- C. Temporary Support: Provide temporary support of work to be cut.
- D. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.
- E. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installers written recommendations.
 1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots neatly to minimum size required and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
 2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
 3. Concrete and Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
 4. Excavating and Backfilling: Comply with requirements in applicable sections where required by cutting and patching operations.
 5. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
 6. Proceed with patching after construction operations requiring cutting are complete.
- F. Patching: Patch construction by filling, repairing, refinishing, closing up and similar operations following performance of other work. Patch with durable seams that are as invisible as practicable. Provide materials and comply with installation requirements specified in other sections, where applicable.

1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate physical integrity of installation.
 2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will minimize evidence of patching and refinishing.
 - a. Clean piping, conduit and similar features before applying paint or other finishing materials.
 - b. Restore damaged pipe covering to its original condition.
 3. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture and appearance. Remove in-place floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.
 - a. Where patching occurs in a painted surface, prepare substrate and apply primer and intermediate paint coats appropriate for substrate over the patch and apply final paint coat over entire unbroken surface containing the patch. Provide additional coats until patch blends with adjacent surfaces.
 4. Ceilings: Patch, repair or rehang in-place ceilings as necessary to provide an even-plane surface of uniform appearance.
 5. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition and ensures thermal and moisture integrity of building enclosure.
- G. Cleaning: Clean areas and spaces where cutting and patching are performed. Remove paint, mortar, oils, putty and similar materials from adjacent finished surfaces.

3.6 OWNER INSTALLED PRODUCTS

- A. Site Access: Provide access to Project site for Owners construction personnel.
- B. Coordination: Coordinate construction and operations of the work with work performed by Owners construction personnel.
 1. Preinstallation Conferences: Include Owners construction personnel at preinstallation conferences covering portions of the work that are to receive Owners work. Attend preinstallation conferences conducted by Owners construction personnel if portions of the work depend on Owners construction.

3.7 PROGRESS CLEANING

- A. General: Clean Project site and work areas daily, including common areas. Enforce requirements strictly. Dispose of materials lawfully.
 1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.

2. Do not hold waste materials more than seven-days during normal weather or three-days if the temperature is expected to rise above 80 deg F.
- B. Site: Maintain Project site free of waste materials and debris.
 - C. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the work.
 1. Remove liquid spills promptly.
 2. Where dust would impair proper execution of the work, broom-clean or vacuum the entire work area, as appropriate.
 - D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.
 - E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.
 - F. Exposed Surfaces in Finished Areas: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.
 - G. Waste Disposal: Do not bury or burn waste materials on-site. Do not wash waste materials down sewers or into waterways. Comply with waste disposal requirements in Section 017419 "Construction Waste Management and Disposal."
 - H. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.
 - I. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.
 - J. Limiting Exposures: Supervise construction operations to ensure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging or otherwise deleterious exposure during the construction period.
- ### 3.8 STARTING AND ADJUSTING
- A. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units and retest.
 - B. Adjust equipment for proper operation. Adjust operating components for proper operation without binding.

- C. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
- D. Manufacturers Field Service: Comply with qualification requirements in Section 014000 "Quality Requirements."

3.9 PROTECTION OF INSTALLED CONSTRUCTION

- A. Provide final protection and maintain conditions that ensure installed work is without damage or deterioration at time of Substantial Completion.
- B. Comply with manufacturers written instructions for temperature and relative humidity.
- C. Repair or remove and replace defective construction. Restore damaged substrates and finishes.
 - 1. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials and properly adjusting operating equipment.
- D. Restore permanent facilities used during construction to their specified condition.
- E. Remove and replace damaged surfaces that are exposed to view if surfaces cannot be repaired without visible evidence of repair.
- F. Repair components that do not operate properly. Remove and replace operating components that cannot be repaired.
- G. Remove and replace chipped, scratched and broken glass or reflective surfaces.

3.9 CORRECTION OF THE WORK

- A. Repair or remove and replace defective construction. Restore damaged substrates and finishes.
 - 1. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials and properly adjusting operating equipment.
- B. Restore permanent facilities used during construction to their specified condition.
- C. Remove and replace damaged surfaces that are exposed to view if surfaces cannot be repaired without visible evidence of repair.
- D. Repair components that do not operate properly. Remove and replace operating components that cannot be repaired.
- E. Remove and replace chipped, scratched and broken glass or reflective surfaces.

END OF SECTION 017300

SECTION 017419 - CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for the following:
 - 1. Recycling non-hazardous construction waste.
 - 2. Disposing of non-hazardous construction waste.

1.3 DEFINITIONS

- A. Construction Waste: Building and site improvement materials and other solid waste resulting from construction operations. Construction waste includes packaging.
- B. Disposal: Removal off-site of demolition and construction waste and subsequent sale, recycling, reuse or deposit in landfill or incinerator acceptable to authorities having jurisdiction.
- C. Recycle: Recovery of demolition or construction waste for subsequent processing in preparation for reuse.
- D. Salvage: Recovery of demolition or construction waste and subsequent sale or reuse in another facility.

1.4 PERFORMANCE REQUIREMENTS

- A. General: Achieve end-of-Project rates for salvage/recycling of 50 percent by weight of total non-hazardous solid waste generated by the work. Practice efficient waste management in the use of materials in the course of the work. Use all reasonable means to divert construction waste from landfills and incinerators. Facilitate recycling and salvage of materials, including the following:
 - 1. Construction Waste:
 - a. Lumber.
 - b. Wood sheet materials.
 - c. Wood trim.
 - d. Metals.
 - e. Roofing.

- f. Insulation.
- g. Piping.
- h. Electrical conduit.
- i. Packaging: Regardless of salvage/recycle goal indicated in "General" paragraph above, salvage or recycle 100 percent of the following uncontaminated packaging materials:
 - 1) Paper.
 - 2) Cardboard.
 - 3) Boxes.
 - 4) Plastic sheet and film.
 - 5) Polystyrene packaging.
 - 6) Wood crates.
 - 7) Plastic pails.

1.5 ACTION SUBMITTALS

- A. Waste Management Plan: Submit plan within 30-days of date established for the Notice of Award.

1.6 INFORMATIONAL SUBMITTALS

- A. Waste Reduction Progress Reports: Concurrent with each Application for Payment, submit report. Include the following information:
 - 1. Material category.
 - 2. Generation point of waste.
 - 3. Total quantity of waste in tons.
 - 4. Quantity of waste salvaged, both estimated and actual in tons.
 - 5. Quantity of waste recycled, both estimated and actual in tons.
 - 6. Total quantity of waste recovered (salvaged plus recycled) in tons.
 - 7. Total quantity of waste recovered (salvaged plus recycled) as a percentage of total waste.
- B. Waste Reduction Calculations: Before request for Substantial Completion, submit calculated end-of-Project rates for salvage, recycling and disposal as a percentage of total waste generated by the work.
- C. Records of Donations: Indicate receipt and acceptance of salvageable waste donated to individuals and organizations. Indicate whether organization is tax exempt.
- D. Records of Sales: Indicate receipt and acceptance of salvageable waste sold to individuals and organizations. Indicate whether organization is tax exempt.
- E. Recycling and Processing Facility Records: Indicate receipt and acceptance of recyclable waste by recycling and processing facilities licensed to accept them. Include manifests, weight tickets, receipts and invoices.

- F. Landfill and Incinerator Disposal Records: Indicate receipt and acceptance of waste by landfills and incinerator facilities licensed to accept them. Include manifests, weight tickets, receipts and invoices.
- G. Qualification Data: For waste management coordinator.

1.7 QUALITY ASSURANCE

- A. Regulatory Requirements: Comply with hauling and disposal regulations of authorities having jurisdiction.
- B. Waste Management Conference: Conduct conference at Project site to comply with requirements in Section 013100 "Project Management and Coordination." Review methods and procedures related to waste management including but not limited to the following:
 - 1. Review and discuss waste management plan including responsibilities of waste management coordinator.
 - 2. Review requirements for documenting quantities of each type of waste and its disposition.
 - 3. Review and finalize procedures for materials separation and verify availability of containers and bins needed to avoid delays.
 - 4. Review procedures for periodic waste collection and transportation to recycling and disposal facilities.
 - 5. Review waste management requirements for each trade.

1.8 WASTE MANAGEMENT PLAN

- A. General: Develop a waste management plan according to ASTM E 1609 and requirements in this section. Plan shall consist of waste identification, waste reduction work plan and cost/revenue analysis. Indicate quantities by weight or volume but use same units of measure throughout waste management plan.
- B. Waste Identification: Indicate anticipated types and quantities of demolition, site-clearing and construction waste generated by the work. Use Form CWM-1 for construction waste. Include estimated quantities and assumptions for estimates.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 PLAN IMPLEMENTATION

- A. General: Implement approved waste management plan. Provide handling, containers, storage, signage, transportation and other items as required to implement waste management plan during the entire duration of the Contract.

- B. Training: Train workers, subcontractors and suppliers on proper waste management procedures, as appropriate for the work.
- C. Site Access and Temporary Controls: Conduct waste management operations to ensure minimum interference with roads, streets, walks, walkways and other adjacent occupied and used facilities.
 - 1. Comply with Section 015000 "Temporary Facilities and Controls" for controlling dust and dirt, environmental protection and noise control.

3.2 RECYCLING CONSTRUCTION WASTE, GENERAL

- A. General: Recycle paper and beverage containers used by on-site workers.
- B. Recycling Incentives: Revenues, savings, rebates, tax credits and other incentives received for recycling waste materials shall accrue to the Contractor.
- C. Preparation of Waste: Prepare and maintain recyclable waste materials according to recycling or reuse facility requirements. Maintain materials free of dirt, adhesives, solvents, petroleum contamination and other substances deleterious to the recycling process.
- D. Procedures: Separate recyclable waste from other waste materials, trash and debris. Separate recyclable waste by type at Project site to the maximum extent practical.
 - 1. Provide appropriately marked containers or bins for controlling recyclable waste until removed from Project site. Include list of acceptable and unacceptable materials at each container and bin.
 - 2. Stockpile processed materials on-site without intermixing with other materials. Place, grade and shape stockpiles to drain surface water. Cover to prevent windblown dust.
 - 3. Stockpile materials away from construction area. Do not store within drip line of trees.
 - 4. Store components off the ground and protect from the weather.
 - 5. Remove recyclable waste from Owners property and transport to recycling receiver or processor.

3.3 RECYCLING CONSTRUCTION WASTE

- A. Packaging:
 - 1. Cardboard and Boxes: Break down packaging into flat sheets. Bundle and store in a dry location.
 - 2. Polystyrene Packaging: Separate and bag materials.
 - 3. Pallets: As much as possible, require deliveries using pallets to remove pallets from Project site. For pallets that remain on-site, break down pallets into component wood pieces and comply with requirements for recycling wood.
 - 4. Crates: Break down crates into component wood pieces and comply with requirements for recycling wood.

B. Wood Materials:

1. Clean Cut-Offs of Lumber: Grind or chip into small pieces.
2. Clean Sawdust: Bag sawdust that does not contain painted or treated wood.

C. Gypsum Board: Stack large clean pieces on wood pallets or in container and store in a dry location.

1. Clean Gypsum Board: Grind scraps of clean gypsum board using small mobile chipper or hammer mill. Screen out paper after grinding.

3.4 DISPOSAL OF WASTE

A. General: Except for items or materials to be salvaged, recycled or otherwise reused, remove waste materials from the Project site and legally dispose of them in a landfill or incinerator acceptable to authorities having jurisdiction.

1. Except as otherwise specified, do not allow waste materials that are to be disposed of accumulations on-site.
2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

B. Burning: Do not burn waste materials.

C. Disposal: Remove waste materials and legally dispose off-site.

D. Disposal: Remove waste materials from the owner's property and legally dispose of them.

END OF SECTION 017419

**PROJECT CLOSE OUT CHECK LIST
PLAN ONE/ARCHITECTS**

Project Title _____
Project # _____
Date: _____

This appendix serves as a check list of the items that should be either in the Owners position or functions that should be performed prior to processing the Contractors final payment.

☐ **Warranties:** Documentation that all applicable manufacturer and equipment warranties have been transferred to the owner.

☐ **Manufacturers Operation and Maintenance Manuals:**
Received Date: _____

☐ **Record of Project Quality Control:**
System Startup and Testing Documentation
Received Date: _____

☐ Training and System Startup:	Warranty Start Date:
Training Date (s)	
Electrical _____	_____
Mechanical _____	_____
Plumbing _____	_____
Carpet _____	_____
Fire Alarm Systems _____	_____
HVAC _____	_____
PA Systems _____	_____
Other _____	_____

☐ **State Electrical Inspectors Final Inspection:**
Date: _____

☐ **State or Local Fire Marshals Final Inspection:**
Date: _____

☐ **Specialties Inspections:**
Date: _____

☐ **Substantial Completion:**
Date: _____

☐ **Final Building Inspection:**
Date: _____

☐ **Issuance of Certificate of Occupancy:**
Date: _____

- ☐ **Sign Off of Final Completion:**
Contractors will certify in writing that he has constructed the facility in accordance to the plans and specifications.
Date: _____
- ☐ **Release of Claims (Subcontractors& Suppliers):** Verification that all Subcontractors have submitted affidavit verification that no claims are pending.
Date: _____
- ☐ **Release of Liens from Contractors:**
Date: _____
- ☐ **Contractor Turns over keys and lock combinations:**
Date: _____
- ☐ **Contractors Letter of Construction Warranty:**
Start Date: _____
Completion Date: _____
- ☐ **Warranty Eleven (11) Month Inspection:**
Scheduled date: _____
- ☐ **Contractors "Request for Retainage Release"**
Date: _____
- ☐ **Public Advertisement Final Notice of Acceptance:**
Date: _____
- ☐ **Project Turnover Memorandums:**
Utilities Date: _____
Communications Date: _____
Building Insurance Date: _____
Others Date: _____
- ☐ **As-Build Drawings:**
Received date: _____
- ☐ **Request of Final Payment:**
Date: _____
- ☐ **Consent of Surety:**
Name of Surety: _____
Address of Surety: _____
Telephone Number of Surety: _____
Date: _____

☐ **Project Accounts:**

Release of retainage Account to Contractor
Finalize all billings

☐ **Archive Project Records:**

Scheduled date: _____
____ (Thirty days after last activity)

SECTION 017700 - CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for contract closeout, including but not limited to the following:
 - 1. Substantial Completion procedures.
 - 2. Final completion procedures.
 - 3. Warranties.
 - 4. Final cleaning.
 - 5. Repair of the work.
 - 6. Plan One project closeout checklist (located at the end of this section).
- B. Related Requirements:
 - 1. Section 013233 "Photographic Documentation" for submitting final completion construction photographic documentation.
 - 2. Section 017823 "Operation and Maintenance Data" for additional operation and maintenance manual requirements.
 - 3. Section 017839 "Project Record Documents" for submitting Record Drawings, Record Specifications and Record Product Data.
 - 4. Section 017900 "Demonstration and Training" for requirements to train the Owners maintenance personnel to adjust, operate and maintain products, equipment and systems.
 - 5. Completion of Architects Closeout Check List (attached) and all related duties.
 - 6. Divisions 2 through 26 for specific closeout and special cleaning requirements for the work in those sections.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of cleaning agent.
- B. Contractors List of Incomplete Items: Initial submittal at Substantial Completion.
- C. Certified List of Incomplete Items: Final submittal at final completion.

1.4 CLOSEOUT SUBMITTALS

- A. Certificates of Release: From authorities having jurisdiction.
- B. Certificate of Insurance: For continuing coverage.
- C. Field Report: For pest control inspection.
- D. Project closeout checklist (included at the end of this section) to be completed and submitted to the Architect upon completion of the project.

1.5 MAINTENANCE MATERIAL SUBMITTALS

- A. Schedule of Maintenance Material Items: For maintenance material submittal items specified in other sections.

1.6 SUBSTANTIAL COMPLETION PROCEDURES

- A. Contractors List of Incomplete Items: Prepare and submit a list of items to be completed and corrected (Contractors punch list), indicating the value of each item on the list and reasons why the work is incomplete.
- B. Submittals Prior to Substantial Completion: Complete the following a minimum of 10-days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.
 - 1. Certificates of Release: Obtain and submit releases from authorities having jurisdiction permitting Owner unrestricted use of the work and access to services and utilities. Include occupancy permits, operating certificates and similar releases.
 - 2. Submit closeout submittals specified in other Division 01 sections, including project record documents, operation and maintenance manuals, damage or settlement surveys, property surveys and similar final record information.
 - 3. Submit closeout submittals specified in individual sections, including specific warranties, workmanship bonds, maintenance service agreements, final certifications and similar documents.
 - 4. Submit maintenance material submittals specified in individual sections, including tools, spare parts, extra materials and similar items and deliver to location designated by Architect. Label with manufacturers name and model number.
 - a. Schedule of Maintenance Material Items: Prepare and submit schedule of maintenance material submittal items, including name and quantity of each item and name and number of related specification section. Obtain Architects signature for receipt of submittals.
 - 5. Submit testing, adjusting and balancing records.
 - 6. Submit changeover information related to Owners occupancy, use, operation and maintenance.

- C. Procedures Prior to Substantial Completion: Complete the following a minimum of 10-days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.
1. Advise Owner of pending insurance changeover requirements.
 2. Make final changeover of permanent locks and deliver keys to Owner. Advise Owners personnel of changeover in security provisions.
 3. Complete startup and testing of systems and equipment.
 4. Perform preventive maintenance on equipment used prior to Substantial Completion.
 5. Instruct Owners personnel in operation, adjustment and maintenance of products, equipment and systems. Submit demonstration and training video recordings specified in Section 017900 "Demonstration and Training."
 6. Advise Owner of changeover in utility services.
 7. Participate with Owner in conducting inspection and walkthrough with local emergency responders.
 8. Terminate and remove temporary facilities from Project site, along with mockups, construction tools and similar elements.
 9. Complete final cleaning requirements.
 10. Touch up paint and otherwise repair and restore marred exposed finishes to eliminate visual defects.
- D. Inspection: Submit a written request for inspection to determine Substantial Completion a minimum of 10-days prior to date the work will be completed and ready for final inspection and tests. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractors list or additional items identified by Architect, that must be completed or corrected before certificate will be issued.
1. Request reinspection when the work identified in previous inspections as incomplete is completed or corrected.
 2. Results of completed inspection will form the basis of requirements for final completion.

1.7 FINAL COMPLETION PROCEDURES

- A. Submittals Prior to Final Completion: Before requesting final inspection for determining final completion, complete the following:
1. Submit a final Application for Payment according to Section 01 29 00 "Payment Procedures."
 2. Certified List of Incomplete Items: Submit certified copy of Architects Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Architect. Certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
 3. Certificate of Insurance: Submit evidence of final, continuing insurance coverage complying with insurance requirements.
 4. Submit pest-control final inspection report.
 5. Submit final completion photographic documentation.

- B. Inspection: Submit a written request for final inspection to determine acceptance a minimum of 10-days prior to date the work will be completed and ready for final inspection and tests. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.
 - 1. Request reinspection when the work identified in previous inspections as incomplete is completed or corrected.

1.8 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

- A. Organization of List: Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.
 - 1. Organize list of spaces in sequential order, starting with exterior areas first and proceeding from lowest floor to highest floor.
 - 2. Organize items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment and building systems.
 - 3. Include the following information at the top of each page:
 - a. Project name.
 - b. Date.
 - c. Name of Architect.
 - d. Name of Contractor.
 - e. Page number.
- B. Punch List Completion and Follow Through: After the Architect has completed and issued the Punch List, the Contractor shall diligently perform all corrective work in an expedient manner and complete all work within the subsequent thirty-days. When complete, the Contractor shall submit a letter back to the Architect certifying that all work is complete. The Contractor shall submit a copy of the Architects punch list, with each item individually signed off by the Contractors primary superintendent, indicating that each item was visually and personally inspected for completeness and quality workmanship.

1.9 SUBMITTAL OF PROJECT WARRANTIES

- A. Time of Submittal: Submit written warranties on request of Architect for designated portions of the work where warranties are indicated to commence on dates other than date of Substantial Completion or when delay in submittal of warranties might limit Owners rights under warranty.
- B. Partial Occupancy: Submit properly executed warranties within 15-days of completion of designated portions of the work that are completed and occupied or used by Owner during construction period by separate agreement with Contractor.

- C. Organize warranty documents into an orderly sequence based on the table of contents of Project Manual.
- D. Warranties in Paper Form:
 - 1. Bind warranties and bonds in heavy-duty, three-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents and sized to receive 8-1/2-inch by-11-inch paper.
 - 2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address and telephone number of Installer.
 - 3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project name and name of Contractor.
- E. Provide additional copies of each warranty to include in operation and maintenance manuals.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.
 - 1. Use cleaning products that comply with Green Seals GS-37 or if GS-37 is not applicable, use products that comply with the California Code of Regulations maximum allowable VOC levels.

PART 3 - EXECUTION

3.1 FINAL CLEANING

- A. General: Perform final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.
- B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturers written instructions.
 - 1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a designated portion of Project:

- a. Clean Project site, yard and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter and other foreign substances.
 - b. Sweep paved areas broom clean. Remove petrochemical spills, stains and other foreign deposits.
 - c. Rake grounds that are not planted, mulched or paved to a smooth, even-textured surface.
 - d. Remove tools, construction equipment, machinery and surplus material from Project site.
 - e. Remove snow and ice to provide safe access to building.
 - f. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
 - g. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics and similar spaces.
 - h. Sweep concrete floors broom clean in unoccupied spaces.
 - i. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Polish mirrors and glass, taking care not to scratch surfaces.
 - j. Remove labels that are not permanent.
 - k. Wipe surfaces of mechanical and electrical equipment and similar equipment. Remove excess lubrication, paint and mortar droppings and other foreign substances.
 - l. Clean light fixtures, lamps, globes and reflectors to function with full efficiency.
 - m. Leave Project clean and ready for occupancy.
- C. Pest Control: Comply with pest control requirements in Section 015000 "Temporary Facilities and Controls." Prepare written report.
- D. Construction Waste Disposal: Comply with waste disposal requirements in Section 017419 "Construction Waste Management and Disposal."

3.2 REPAIR OF THE WORK

- A. Complete repair and restoration operations before requesting inspection for determination of Substantial Completion.
- B. Repair or remove and replace, defective construction. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials and properly adjusting operating equipment. Where damaged or worn items cannot be repaired or restored, provide replacements. Remove and replace operating components that cannot be repaired. Restore damaged construction and permanent facilities used during construction to specified condition.
 - 1. Remove and replace chipped, scratched and broken glass, reflective surfaces and other damaged transparent materials.

2. Touch up and otherwise repair and restore marred or exposed finishes and surfaces. Replace finishes and surfaces that that already show evidence of repair or restoration.
 - a. Do not paint over "UL" and other required labels and identification, including mechanical and electrical nameplates. Remove paint applied to required labels and identification.
3. Replace parts subject to operating conditions during construction that may impede operation or reduce longevity.
4. Replace burned-out bulbs, bulbs noticeably dimmed by hours of use and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.

END OF SECTION 017700

SECTION 017823 - OPERATION AND MAINTENANCE DATA

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for preparing operation and maintenance manuals, including the following:
 - 1. Operation and maintenance documentation directory manuals.
 - 2. Emergency manuals.
 - 3. Systems and equipment operation manuals.
 - 4. Systems and equipment maintenance manuals.
 - 5. Product maintenance manuals.
- B. Related Requirements:
 - 1. Section 013300 "Submittal Procedures" for submitting copies of submittals for operation and maintenance manuals.
 - 2. Section 017700 "Closeout Procedures" for submitting operation and maintenance manuals.
 - 3. Section 017839 "Project Record Documents" for preparing record drawings for operation and maintenance manuals.
 - 4. Divisions 2 through 26 sections for specific operation and maintenance manual requirements for the work in those sections.

1.3 DEFINITIONS

- A. System: An organized collection of parts, equipment or subsystems united by regular interaction.
- B. Subsystem: A portion of a system with characteristics similar to a system.

1.4 CLOSEOUT SUBMITTALS

- A. Submit operation and maintenance manuals indicated. Provide content for each manual as specified in individual specification sections and as reviewed and approved at the time of section submittals. Submit reviewed manual content formatted and organized as required by this section.

1. Architect will comment on whether content of operation and maintenance submittals is acceptable.
 2. Where applicable, clarify and update reviewed manual content to correspond to revisions and field conditions.
- B. Format: Submit operation and maintenance manuals in the following format:
- C. Initial Submittal: Submit two (2) draft copies of each manual at least ten (10) working-days before requesting inspection for Substantial Completion. Include a complete operation and maintenance directory. Architect will return one (1) copy of draft and mark whether general scope and content of manual are acceptable.
- D. Final Submittal: Submit one (1) copy of each manual in final form at least ten (10) working-days before final inspection.
1. Correct or modify each manual to comply with Architects comments. Submit three (3) copies of each corrected manual within ten (10) working days of receipt of Architects comments.
- E. Comply with Section 017700 "Closeout Procedures" for schedule for submitting operation and maintenance documentation.

1.5 FORMAT OF OPERATION AND MAINTENANCE MANUALS

- A. Manuals, Paper Copy: Submit manuals in the form of hard-copy, bound and labeled volumes.
1. Binders: Heavy-duty, three-ring, vinyl-covered, loose-leaf binders, in thickness necessary to accommodate contents, sized to hold 8-1/2-inch by-11-inch paper; with clear plastic sleeve on spine to hold label describing contents and with pockets inside covers to hold folded oversize sheets.
 - a. If two or more binders are necessary to accommodate data of a system organize data in each binder into groupings by subsystem and related components. Cross-reference other binders if necessary to provide essential information for proper operation or maintenance of equipment or system.
 - b. Identify each binder on front and spine, with printed title "OPERATION AND MAINTENANCE MANUAL," Project title or name and subject matter of contents and indicate specification section number on bottom of spine. Indicate volume number for multiple-volume sets.
 2. Dividers: Heavy-paper dividers with plastic-covered tabs for each section of the manual. Mark each tab to indicate contents. Include typed list of products and major components of equipment included in the section on each divider, cross-referenced to specification section number and title of Project Manual.
 3. Protective Plastic Sleeves: Transparent plastic sleeves designed to enclose diagnostic software storage media for computerized electronic equipment. Enclose title pages and directories in clear plastic sleeves.

4. Supplementary Text: Prepared on 8-1/2-inch by-11-inch white bond paper.
5. Drawings: Attach reinforced, punched binder tabs on drawings and bind with text.
 - a. If oversize drawings are necessary, fold drawings to same size as text pages and use as foldouts.
 - b. If drawings are too large to be used as foldouts, fold and place drawings in labeled envelopes and bind envelopes in rear of manual. At appropriate locations in manual, insert typewritten pages indicating drawing titles, descriptions of contents and drawing locations.

1.6 REQUIREMENTS FOR EMERGENCY, OPERATION AND MAINTENANCE MANUALS

- A. Organization of Manuals: Unless otherwise indicated organize each manual into a separate section for each system and subsystem and a separate section for each piece of equipment not part of a system. Each manual shall contain the following materials, in the order listed:
 1. Title page.
 2. Table of contents.
 3. Manual contents.
- B. Title Page: Include the following information:
 1. Subject matter included in manual.
 2. Name and address of Project.
 3. Name and address of Owner.
 4. Date of submittal.
 5. Name and contact information for Contractor.
 6. Name and contact information for Architect.
 7. Names and contact information for major consultants to the Architect that designed the systems contained in the manuals.
 8. Cross-reference to related systems in other operation and maintenance manuals.
- C. Table of Contents: List each product included in manual, identified by product name, indexed to the content of the volume and cross-referenced to specification section number in Project Manual.
 1. If operation or maintenance documentation requires more than one volume to accommodate data, include comprehensive table of contents for all volumes in each volume of the set.
- D. Manual Contents: Organize into sets of manageable size. Arrange contents alphabetically by system, subsystem and equipment. If possible, assemble instructions for subsystems, equipment and components of one system into a single binder.
- E. Identification: In the documentation directory and in each operation and maintenance manual, identify each system, subsystem and piece of equipment with same designation used in the Contract Documents. If no designation exists, assign a

designation according to ASHRAE Guideline 4, "Preparation of Operating and Maintenance Documentation for Building Systems."

1.7 OPERATION AND MAINTENANCE DOCUMENTATION DIRECTORY MANUAL

- A. Operation and Maintenance Documentation Directory: Prepare a separate manual that provides an organized reference to emergency, operation and maintenance manuals. List items and their location to facilitate ready access to desired information. Include the following:
 - 1. List of Systems and Subsystems: List systems alphabetically. Include references to operation and maintenance manuals that contain information about each system.
 - 2. List of Equipment: List equipment for each system organized alphabetically by system. For pieces of equipment not part of system, list alphabetically in separate list.
 - 3. Tables of Contents: Include a table of contents for each emergency, operation and maintenance manual.

1.8 EMERGENCY MANUALS

- A. Emergency Manual: Assemble a complete set of emergency information indicating procedures for use by emergency personnel and by Owners operating personnel for types of emergencies indicated.
- B. Content: Organize manual into a separate section for each of the following:
 - 1. Type of emergency.
 - 2. Emergency instructions.
 - 3. Emergency procedures.
- C. Type of Emergency: Where applicable for each type of emergency indicated below, include instructions and procedures for each system, subsystem, piece of equipment and component:
 - 1. Fire.
 - 2. Flood.
 - 3. Gas leak.
 - 4. Water leak.
 - 5. Power failure.
 - 6. Water outage.
 - 7. System, subsystem or equipment failure.
 - 8. Chemical release or spill.
- D. Emergency Instructions: Describe and explain warnings, trouble indications, error messages and similar codes and signals. Include responsibilities of Owners operating personnel for notification of Installer, supplier and manufacturer to maintain warranties.
- E. Emergency Procedures: Include the following, as applicable:

1. Instructions on stopping.
2. Shutdown instructions for each type of emergency.
3. Operating instructions for conditions outside normal operating limits.
4. Required sequences for electric or electronic systems.
5. Special operating instructions and procedures.

1.9 SYSTEMS AND EQUIPMENT OPERATION MANUALS

- A. Systems and Equipment Operation Manual: Assemble a complete set of data indicating operation of each system, subsystem and piece of equipment not part of a system. Include information required for daily operation and management, operating standards and routine and special operating procedures.
 1. Engage a factory-authorized service representative to assemble and prepare information for each system, subsystem and piece of equipment not part of a system.
 2. Prepare a separate manual for each system and subsystem, in the form of an instructional manual for use by Owners operating personnel.
- B. Content: In addition to requirements in this section, include operation data required in individual specification sections and the following information:
 1. System, subsystem and equipment descriptions. Use designations for systems and equipment indicated on Contract Documents.
 2. Performance and design criteria if Contractor has delegated design responsibility.
 3. Operating standards.
 4. Operating procedures.
 5. Operating logs.
 6. Wiring diagrams.
 7. Control diagrams.
 8. Piped system diagrams.
 9. Precautions against improper use.
 10. License requirements including inspection and renewal dates.
- C. Descriptions: Include the following:
 1. Product name and model number. Use designations for products indicated on Contract Documents.
 2. Manufacturers name.
 3. Equipment identification with serial number of each component.
 4. Equipment function.
 5. Operating characteristics.
 6. Limiting conditions.
 7. Performance curves.
 8. Engineering data and tests.
 9. Complete nomenclature and number of replacement parts.
- D. Operating Procedures: Include the following, as applicable:

1. Startup procedures.
 2. Equipment or system break-in procedures.
 3. Routine and normal operating instructions.
 4. Regulation and control procedures.
 5. Instructions on stopping.
 6. Normal shutdown instructions.
 7. Seasonal and weekend operating instructions.
 8. Required sequences for electric or electronic systems.
 9. Special operating instructions and procedures.
- E. Systems and Equipment Controls: Describe the sequence of operation and diagram controls as installed.
- F. Piped Systems: Diagram piping as installed and identify color coding where required for identification.

1.10 SYSTEMS AND EQUIPMENT MAINTENANCE MANUALS

- A. Systems and Equipment Maintenance Manuals: Assemble a complete set of data indicating maintenance of each system, subsystem and piece of equipment not part of a system. Include manufacturers maintenance documentation, preventive maintenance procedures and frequency, repair procedures, wiring and systems diagrams, lists of spare parts and warranty information.
1. Engage a factory-authorized service representative to assemble and prepare information for each system, subsystem and piece of equipment not part of a system.
 2. Prepare a separate manual for each system and subsystem, in the form of an instructional manual for use by Owners operating personnel.
- B. Content: For each system, subsystem and piece of equipment not part of a system, include source information, manufacturers maintenance documentation, maintenance procedures, maintenance and service schedules, spare parts list and source information, maintenance service contracts and warranties and bonds as described below.
- C. Source Information: List each system, subsystem and piece of equipment included in manual, identified by product name and arranged to match manuals table of contents. For each product, list name, address and telephone number of Installer or supplier and maintenance service agent and cross-reference specification section number and title in Project Manual and drawing or schedule designation or identifier where applicable.
- D. Manufacturers Maintenance Documentation: Include the following information for each component part or piece of equipment:
1. Standard maintenance instructions and bulletins; include only sheets pertinent to product or component installed. Mark each sheet to identify each product or component incorporated into the work. If data include more than one item in a tabular format, identify each item using appropriate references from the Contract

Documents. Identify data applicable to the work and delete references to information not applicable.

- a. Prepare supplementary text if manufacturers standard printed data are not available and where the information is necessary for proper operation and maintenance of equipment or systems.
 2. Drawings, diagrams and instructions required for maintenance, including disassembly and component removal, replacement and assembly.
 3. Identification and nomenclature of parts and components.
 4. List of items recommended to be stocked as spare parts.
- E. Maintenance Procedures: Include the following information and items that detail essential maintenance procedures:
1. Test and inspection instructions.
 2. Troubleshooting guide.
 3. Precautions against improper maintenance.
 4. Disassembly; component removal, repair and replacement and reassembly instructions.
 5. Aligning, adjusting and checking instructions.
 6. Demonstration and training video recording, if available.
- F. Maintenance and Service Schedules: Include service and lubrication requirements, list of required lubricants for equipment and separate schedules for preventive and routine maintenance and service with standard time allotment.
1. Scheduled Maintenance and Service: Tabulate actions for daily, weekly, monthly, quarterly, semi-annual and annual frequencies.
 2. Maintenance and Service Record: Include manufacturers forms for recording maintenance.
- G. Spare Parts List and Source Information: Include lists of replacement and repair parts, with parts identified and cross-referenced to manufacturers maintenance documentation and local sources of maintenance materials and related services.
- H. Maintenance Service Contracts: Include copies of maintenance agreements with name and telephone number of service agent.
- I. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.
1. Include procedures to follow and required notifications for warranty claims.
- J. Drawings: Prepare drawings supplementing manufacturers printed data to illustrate the relationship of component parts of equipment and systems and to illustrate control sequence and flow diagrams. Coordinate these drawings with information contained in record drawings to ensure correct illustration of completed installation.
1. Do not use original project record documents as part of maintenance manuals.

1.11 PRODUCT MAINTENANCE MANUALS

- A. Product Maintenance Manual: Assemble a complete set of maintenance data indicating care and maintenance of each product, material and finish incorporated into the work.
- B. Content: Organize manual into a separate section for each product, material and finish. Include source information, product information, maintenance procedures, repair materials and sources and warranties and bonds, as described below.
- C. Source Information: List each product included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address and telephone number of Installer or supplier and maintenance service agent and cross-reference specification section number and title in Project Manual and drawing or schedule designation or identifier where applicable.
- D. Product Information: Include the following, as applicable:
 - 1. Product name and model number.
 - 2. Manufacturer's name.
 - 3. Color, pattern and texture.
 - 4. Material and chemical composition.
 - 5. Reordering information for specially manufactured products.
- E. Maintenance Procedures: Include manufacturer's written recommendations and the following:
 - 1. Inspection procedures.
 - 2. Types of cleaning agents to be used and methods of cleaning.
 - 3. List of cleaning agents and methods of cleaning detrimental to product.
 - 4. Schedule for routine cleaning and maintenance.
 - 5. Repair instructions.
- F. Repair Materials and Sources: Include lists of materials and local sources of materials and related services.
- G. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.
 - 1. Include procedures to follow and required notifications for warranty claims.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 017823

SECTION 017839 - PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for project record documents including the following:
 - 1. Record drawings.
 - 2. Record specifications.
 - 3. Record product data.
 - 4. Miscellaneous record submittals.
- B. Related Requirements:
 - 1. Section 017300 "Execution" for final property survey.
 - 2. Section 017700 "Closeout Procedures" for general closeout procedures.
 - 3. Section 017823 "Operation and Maintenance Data" for operation and maintenance manual requirements.

1.3 CLOSEOUT SUBMITTALS

- A. Record Drawings: Comply with the following:
 - 1. Number of Copies: Submit one set of marked-up record prints.
 - 2. Number of Copies: Submit copies of record drawings as follows:
 - 1) Submit one PDF electronic file, scanned of all record prints and one full set of prints to the Owner at the end of the job.
 - 2) Print each drawing, whether or not changes and additional information were recorded.
- B. Record Specifications: Submit one paper copy of project specifications, including addenda and contract modifications.
- C. Record Product Data: Submit one paper copy of each submittal.
 - 1. Where record product data are required as part of operation and maintenance manuals, submit duplicate marked-up product data as a component of manual.

- D. Miscellaneous Record Submittals: See other specification sections for miscellaneous record-keeping requirements and submittals in connection with various construction activities. Submit one paper copy of each submittal.

1.4 RECORD DRAWINGS

- A. Record Prints: Maintain one set of marked-up paper copies of the contract drawings and shop drawings, incorporating new and revised drawings as modifications are issued.
 - 1. Preparation: Mark record prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor or similar entity, to provide information for preparation of corresponding marked-up record prints.
 - a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
 - b. Accurately record information in an acceptable drawing technique.
 - c. Record data as soon as possible after obtaining it.
 - d. Record and check the markup before enclosing concealed installations.
 - e. Cross-reference record prints to corresponding photographic documentation.
 - 2. Content: Types of items requiring marking include but are not limited to the following:
 - a. Dimensional changes to drawings.
 - b. Revisions to details shown on drawings.
 - c. Depths of foundations.
 - d. Locations and depths of underground utilities.
 - e. Revisions to routing of piping and conduits.
 - f. Revisions to electrical circuitry.
 - g. Actual equipment locations.
 - h. Duct size and routing.
 - i. Locations of concealed internal utilities.
 - j. Changes made by Change Order or Construction Change Directive.
 - k. Changes made following Architects written orders.
 - l. Details not on the original contract drawings.
 - m. Field records for variable and concealed conditions.
 - n. Record information on the work that is shown only schematically.
 - 3. Mark the contract drawings and shop drawings completely and accurately. Use personnel proficient at recording graphic information in production of marked-up record prints.
 - 4. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
 - 5. Mark important additional information that was either shown schematically or omitted from original drawings.

6. Note Construction Change Directive numbers, alternate numbers, Change Order numbers and similar identification, where applicable.
- B. Format: Identify and date each record drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.
 1. Record Prints: Organize record prints into manageable sets. Bind each set with durable paper cover sheets. Include identification on cover sheets.

1.5 RECORD SPECIFICATIONS

- A. Preparation: Mark specifications to indicate the actual product installation where installation varies from that indicated in specifications, addenda and contract modifications.
 1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
 2. Mark copy with the proprietary name and model number of products, materials and equipment furnished, including substitutions and product options selected.
 3. Record the name of manufacturer, supplier, installer and other information necessary to provide a record of selections made.
 4. For each principal product, indicate whether record product data has been submitted in operation and maintenance manuals instead of submitted as record product data.
 5. Note related Change Orders and record drawings where applicable.

1.6 RECORD SUBMITTAL DATA

- A. Recording: Maintain one copy of each submittal during the construction period for project record document purposes. Post changes and revisions to project record documents as they occur; do not wait until end of Project.
- B. Preparation: Mark product data to indicate the actual product installation where installation varies substantially from that indicated in product data submittal.
 1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
 2. Include significant changes in the product delivered to Project site and changes in manufacturers written instructions for installation.
 3. Note related Change Orders, record specifications and record drawings where applicable.

1.7 MISCELLANEOUS RECORD SUBMITTALS

- A. Assemble miscellaneous records required by other specification sections for miscellaneous record keeping and submittal in connection with actual performance of the work. Bind or file miscellaneous records and identify each, ready for continued use and reference.

1.8 MAINTENANCE OF RECORD DOCUMENTS

- A. Maintenance of Record Documents: Store record documents in the field office apart from the contract documents used for construction. Do not use project record documents for construction purposes. Maintain record documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to project record documents for Architects reference during normal working hours.

PART 2 - PRODUCTS

PART 3 - EXECUTION

END OF SECTION 017839

SECTION 017900 - DEMONSTRATION AND TRAINING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for instructing Owners personnel, including the following:
 - 1. Instruction in operation and maintenance of systems, subsystems and equipment.
 - 2. Demonstration and training video recordings.

1.3 INFORMATIONAL SUBMITTALS

- A. Instruction Program: Submit outline of instructional program for demonstration and training, including a list of training modules and a schedule of proposed dates, times, length of instruction time and instructors names for each training module. Include learning objective and outline for each training module.
 - 1. Indicate proposed training modules using manufacturer-produced demonstration and training video recordings for systems, equipment and products in lieu of video recording of live instructional module.
- B. Qualification Data: For facilitator and professional photographer.
- C. Attendance Record: For each training module, submit list of participants and length of instruction time.
- D. Evaluations: For each participant and for each training module, submit results and documentation of performance-based test.

1.4 CLOSEOUT SUBMITTALS

- A. Demonstration and Training DVD's: Submit two copies within seven-days of end of each training module.
 - 1. Identification: On each copy provide an applied label with the following information:

- a. Name of Project.
- b. Name and address of videographer.
- c. Name of Architect.
- d. Name of Contractor.
- e. Date of recording.

1.5 QUALITY ASSURANCE

- A. Facilitator Qualifications: A firm or individual experienced in training or educating maintenance personnel in a training program similar in content and extent to that indicated for this Project and whose work has resulted in training or education with a record of successful learning performance.
- B. Instructor Qualifications: A factory-authorized service representative, complying with requirements in Section 014000 "Quality Requirements," experienced in operation and maintenance procedures and training.
- C. Videographer Qualifications: A professional videographer who is experienced photographing demonstration and training events similar to those required.
- D. Pre-instruction Conference: Conduct conference at Project site to comply with requirements in Section 013100 "Project Management and Coordination." Review methods and procedures related to demonstration and training.

1.6 COORDINATION

- A. Coordinate instruction schedule with Owners operations. Adjust schedule as required to minimize disrupting Owners operations and to ensure availability of Owners personnel.
- B. Coordinate instructors including providing notification of dates, times, length of instruction time and course content.
- C. Coordinate content of training modules with content of approved emergency, operation and maintenance manuals. Do not submit instruction program until operation and maintenance data have been reviewed and approved by Architect.

1.7 INSTRUCTION PROGRAM

- A. Program Structure: Develop an instruction program that includes individual training modules for each system and for equipment not part of a system as required by individual specification sections.
- B. Training Modules: Develop a learning objective and teaching outline for each module. Include a description of specific skills and knowledge that participant is expected to master. For each module, include instruction for the following as applicable to the system, equipment or component:

1. Basis of System Design, Operational Requirements and Criteria: Include the following:
 - a. System, subsystem and equipment descriptions.
 - b. Operating standards.
 - c. Regulatory requirements.
 - d. Equipment function.
 - e. Operating characteristics.
 - f. Limiting conditions.
 - g. Performance curves.
2. Documentation: Review the following items in detail:
 - a. Emergency manuals.
 - b. Systems and equipment operation manuals.
 - c. Systems and equipment maintenance manuals.
 - d. Product maintenance manuals.
 - e. Project record documents.
 - f. Identification systems.
 - g. Warranties and bonds.
 - h. Maintenance service agreements and similar continuing commitments.
3. Emergencies: Include the following, as applicable:
 - a. Instructions on meaning of warnings, trouble indications and error messages.
 - b. Instructions on stopping.
 - c. Shutdown instructions for each type of emergency.
 - d. Operating instructions for conditions outside of normal operating limits.
 - e. Sequences for electric or electronic systems.
 - f. Special operating instructions and procedures.
4. Operations: Include the following as applicable:
 - a. Startup procedures.
 - b. Equipment or system break-in procedures.
 - c. Routine and normal operating instructions.
 - d. Regulation and control procedures.
 - e. Control sequences.
 - f. Safety procedures.
 - g. Instructions on stopping.
 - h. Normal shutdown instructions.
 - i. Operating procedures for emergencies.
 - j. Operating procedures for system, subsystem or equipment failure.
 - k. Seasonal and weekend operating instructions.
 - l. Required sequences for electric or electronic systems.
 - m. Special operating instructions and procedures.
5. Adjustments: Include the following:
 - a. Alignments.

- b. Checking adjustments.
 - c. Noise and vibration adjustments.
 - d. Economy and efficiency adjustments.
- 6. Troubleshooting: Include the following:
 - a. Diagnostic instructions.
 - b. Test and inspection procedures.
- 7. Maintenance: Include the following:
 - a. Inspection procedures.
 - b. Types of cleaning agents to be used and methods of cleaning.
 - c. List of cleaning agents and methods of cleaning detrimental to product.
 - d. Procedures for routine cleaning.
 - e. Procedures for preventive maintenance.
 - f. Procedures for routine maintenance.
 - g. Instruction on use of special tools.
- 8. Repairs: Include the following:
 - a. Diagnosis instructions.
 - b. Repair instructions.
 - c. Disassembly; component removal, repair and replacement and reassembly instructions.
 - d. Instructions for identifying parts and components.
 - e. Review of spare parts needed for operation and maintenance.

1.8 PREPARATION

- A. Assemble educational materials necessary for instruction, including documentation and training module. Assemble training modules into a training manual organized in coordination with requirements in Section 017823 "Operation and Maintenance Data."
- B. Set up instructional equipment at instruction location.

1.9 INSTRUCTION

- A. Facilitator: Engage a qualified facilitator to prepare instruction program and training modules, to coordinate instructors and to coordinate between Contractor and Owner for number of participants, instruction times and location.
- B. Engage qualified instructors to instruct Owners personnel to adjust, operate and maintain systems, subsystems and equipment not part of a system.
 - 1. Owner will furnish an instructor to describe Owners operational philosophy.
- C. Scheduling: Provide instruction at mutually agreed-on times. For equipment that requires seasonal operation, provide similar instruction at start of each season.

1. Schedule training with Owner through Architect with at least seven-days advance notice.
- D. Training Location and Reference Material: Conduct training on-site in the completed and fully operational facility using the actual equipment in-place. Conduct training using final operation and maintenance data submittals.

1.10 DEMONSTRATION AND TRAINING VIDEO RECORDINGS

- A. General: Engage a qualified commercial videographer to record demonstration and training video recordings. Record each training module separately. Include classroom instructions and demonstrations, board diagrams and other visual aids but not student practice.
1. At beginning of each training module, record each chart containing learning objective and lesson outline.
- B. Narration: Describe scenes on DVD by audio narration by microphone while video recording is recorded. Include description of items being viewed.

PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 017900

SECTION 024116 - STRUCTURE DEMOLITION

GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this section.

1.02 SUMMARY

- A. Section Includes:
 - 1. Demolition and removal of buildings and site improvements.
 - 2. Removing below-grade construction.
 - 3. Disconnecting, capping or sealing and removing site utilities.
 - 4. Salvaging items for reuse by Owner.
- B. Related Requirements:
 - 1. Section 011000 "Summary" for use of the premises and phasing requirements.
 - 2. Section 013200 "Construction Progress Documentation" for preconstruction photographs taken before building demolition.
 - 3. Section 024119 "Selective Demolition" for partial demolition of buildings, structures, and site improvements.
 - 4. Section 311000 "Clearing and Grubbing" for site clearing and removal of above and below-grade site improvements not part of building demolition.

1.03 DEFINITIONS

- A. Remove: Detach items from existing construction and dispose of them off-site unless indicated to be salvaged.
- B. Remove and Salvage: Detach items from existing construction, in a manner to prevent damage and deliver to Owner ready for reuse. Include fasteners or brackets needed for reattachment elsewhere.

1.04 MATERIALS OWNERSHIP

- A. Unless otherwise indicated, demolition waste becomes property of Contractor.
- B. Historic items, relics, antiques and similar objects including but not limited to cornerstones and their contents, commemorative plaques and tablets and other items of interest or value to Owner that may be uncovered during demolition remain the property of Owner.
 - 1. Carefully salvage in a manner to prevent damage and promptly return to Owner.

1.05 PRE-INSTALLATION MEETINGS

- A. Pre-demolition Conference: Conduct conference at Project site.
 - 1. Inspect and discuss condition of construction to be demolished.
 - 2. Review structural load limitations of existing structures.
 - 3. Review and finalize building demolition schedule and verify availability of demolition personnel, equipment and facilities needed to make progress and avoid delays.
 - 4. Review and finalize protection requirements.
 - 5. Review procedures for noise control and dust control.
 - 6. Review procedures for protection of adjacent buildings.
 - 7. Review items to be salvaged and returned to Owner.

1.06 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For refrigerant recovery technician.
- B. Engineering Survey: Submit engineering survey of condition of building.
- C. Proposed Protection Measures: Submit report, including drawings, that indicates the measures proposed for protecting individuals and property for environmental protection, dust control and noise control. Indicate proposed locations and construction of barriers.
 - 1. Adjacent Buildings: Detail special measures proposed to protect adjacent buildings to remain including means of egress from those buildings.
- D. Schedule of Building Demolition Activities: Indicate the following:
 - 1. Detailed sequence of demolition work, with starting and ending dates for each activity.
 - 2. Temporary interruption of utility services.
 - 3. Shutoff and capping of utility services.
- E. Pre-demolition Photographs or Video: Show existing conditions of adjoining construction and site improvements, including finish surfaces that might be misconstrued as damage caused by demolition operations. Comply with Section 013233 "Photographic Documentation." Submit before the work begins.
- F. Statement of Refrigerant Recovery: Signed by refrigerant recovery technician responsible for recovering refrigerant, stating that all refrigerant that was present was recovered and that recovery was performed according to EPA regulations. Include name and address of technician and date refrigerant was recovered.

1.07 CLOSEOUT SUBMITTALS

- A. Inventory: Submit a list of items that have been removed and salvaged.

1.08 QUALITY ASSURANCE

- A. Refrigerant Recovery Technician Qualifications: Certified by EPA-approved certification program.

1.09 FIELD CONDITIONS

- A. Buildings to be demolished will be vacated and their use discontinued before start of the work.
- B. Buildings immediately adjacent to demolition area will be occupied. Conduct building demolition so operations of occupied buildings will not be disrupted.
 - 1. Provide not less than 72 hours notice of activities that will affect operations of adjacent occupied buildings.
 - 2. Maintain access to existing walkways, exits and other facilities used by occupants of adjacent buildings.
 - a. Do not close or obstruct walkways, exits or other facilities used by occupants of adjacent buildings without written permission from authorities having jurisdiction.
- C. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.
- D. Hazardous Materials: It is not expected that hazardous materials will be encountered in the work.
 - 1. Hazardous materials will be removed by Owner before start of the work.
 - 2. If materials suspected of containing hazardous materials are encountered, do not disturb; immediately notify Architect and Owner. Hazardous materials will be removed by Owner under a separate contract.
- E. Hazardous Materials: Present in buildings and structures to be demolished:
 - 1. Do not disturb hazardous materials or items suspected of containing hazardous materials except under procedures specified elsewhere in the Contract Documents.
- F. On-site storage or sale of removed items or materials is not permitted.

1.10 COORDINATION

- A. Arrange demolition schedule so as not to interfere with Owners on-site operations or operations of adjacent occupied buildings.

PRODUCTS

2.01 PERFORMANCE REQUIREMENTS

- A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.
- B. Standards: Comply with ASSE A10.6 and NFPA 241.

2.02 SOIL MATERIALS

- A. Satisfactory Soils: Comply with requirements in Section 31 20 00 "Earth Moving."

EXECUTION

3.01 EXAMINATION

- A. Verify that utilities have been disconnected and capped before starting demolition operations.
- B. Review Project Record Documents of existing construction or other existing condition and hazardous material information provided by Owner. Owner does not guarantee that existing conditions are same as those indicated in Project Record Documents.
- C. Engage a professional engineer to perform an engineering survey of condition of building to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of structure or adjacent structures during building demolition operations.
- D. Steel Tendons: Locate tensioned steel tendons and include recommendations for de-tensioning.
- E. Verify that hazardous materials have been remediated before proceeding with building demolition operations.
- F. Inventory and record the condition of items to be removed and salvaged. Provide photographs or video of conditions that might be misconstrued as damage caused by salvage operations. Comply with Section 01 32 33 "Photographic Documentation.

3.02 PREPARATION

- A. Refrigerant: Before starting demolition, remove refrigerant from mechanical equipment according to 40 CFR 82 and regulations of authorities having jurisdiction.
- B. Salvaged Items: Comply with the following:
 - 1. Clean salvaged items of dirt and demolition debris.
 - 2. Pack or crate items after cleaning. Identify contents of containers.
 - 3. Store items in a secure area until delivery to Owner.
 - 4. Transport items to storage area designated by Owner.
 - 5. Protect items from damage during transport and storage.

3.03 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

- 1. Arrange to shut off utilities with utility companies.
- 2. If removal, relocation or abandonment of utility services will affect adjacent occupied buildings, then provide temporary utilities that bypass buildings and structures to be demolished and that maintain continuity of service to other buildings and structures.
- 3. Cut off pipe or conduit a minimum of 24-inches below grade. Cap, valve or plug and seal remaining portion of pipe or conduit after bypassing according to requirements of authorities having jurisdiction.
- 4. Do not start demolition work until utility disconnecting and sealing have been completed and verified in writing.

3.04 PROTECTION

- A. Existing Facilities: Protect adjacent walkways, building entries and other building facilities during demolition operations. Maintain exits from existing buildings.
- B. Temporary Shoring: Provide and maintain interior and exterior shoring, bracing or structural support to preserve stability and prevent unexpected movement or collapse of construction being demolished.
 - 1. Strengthen or add new supports when required during progress of demolition.
- C. Existing Utilities to Remain: Maintain utility services to remain and protect from damage during demolition operations.
 - 1. Do not interrupt existing utilities serving adjacent occupied or operating facilities unless authorized in writing by Owner and authorities having jurisdiction.
 - 2. Provide temporary services during interruptions to existing utilities, as acceptable to Owner and authorities having jurisdiction.
 - a. Provide at least 72-hours notice to occupants of affected buildings if shutdown of service is required during changeover.
- D. Temporary Protection: Erect temporary protection, such as walks, fences, railings, canopies and covered passageways, where required by authorities having jurisdiction and as indicated. Comply with requirements in Section 01 50 00 "Temporary Facilities and Controls."
 - 1. Protect adjacent buildings and facilities from damage due to demolition activities.
 - 2. Protect existing site improvements, appurtenances and landscaping to remain.
 - 3. Erect a plainly visible fence around drip line of individual trees or around perimeter drip line of groups of trees to remain.
 - 4. Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.
 - 5. Provide protection to ensure safe passage of people around building demolition area and to and from occupied portions of adjacent buildings and structures.
 - 6. Protect walls, windows, roofs and other adjacent exterior construction that are to remain and that are exposed to building demolition operations.
 - 7. Erect and maintain dustproof partitions and temporary enclosures to limit dust, noise and dirt migration to occupied portions of adjacent buildings.
- E. Remove temporary barriers and protections where hazards no longer exist. Where open excavations or other hazardous conditions remain, leave temporary barriers and protections in place.

3.05 DEMOLITION, GENERAL

- A. General: Demolish indicated buildings and site improvements completely. Use methods required to complete the work within limitations of governing regulations and as follows:
 - 1. Do not use cutting torches until work area is cleared of flammable materials. Maintain portable fire-suppression devices during flame-cutting operations.
 - 2. Maintain fire watch during and for at least 24-hours after flame-cutting operations.
 - 3. Maintain adequate ventilation when using cutting torches.

4. Locate building demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors or framing.
- B. Site Access and Temporary Controls: Conduct building demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways and other adjacent occupied and used facilities.
 1. Do not close or obstruct streets, walks, walkways or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by authorities having jurisdiction.
 2. Use water mist and other suitable methods to limit spread of dust and dirt. Comply with governing environmental-protection regulations. Do not use water when it may damage adjacent construction or create hazardous or objectionable conditions, such as ice, flooding and pollution.
- C. Explosives: Use of explosives is not permitted.

3.06 DEMOLITION BY MECHANICAL MEANS

- A. Proceed with demolition of structural framing members systematically, from higher to lower level. Complete building demolition operations above each floor or tier before disturbing supporting members on the next lower level.
- B. Remove debris from elevated portions of the building by chute, hoist or other device that will convey debris to grade level in a controlled descent.
 1. Remove structural framing members and lower to ground by method suitable to minimize ground impact and dust generation.
- C. Salvage: Items to be removed and salvaged are indicated below:
- D. Below-Grade Construction: Demolish foundation walls and other below-grade construction.
 1. Remove below-grade construction, including basements, foundation walls and footings, completely.
- E. Existing Utilities: Demolish and remove existing utilities and below-grade utility structures.

3.07 SITE RESTORATION

- A. Below-Grade Areas: Rough grade below-grade areas ready for further excavation or new construction.
- B. Below-Grade Areas: Completely fill below-grade areas and voids resulting from building demolition operations with satisfactory soil materials according to backfill requirements in Section 31 20 00 "Earth Moving."
- C. Site Grading: Uniformly rough grade area of demolished construction to a smooth surface, free from irregular surface changes. Provide a smooth transition between adjacent existing grades and new grades.

3.08 REPAIRS

- A. Promptly repair damage to adjacent buildings caused by demolition operations.

3.09 DISPOSAL OF DEMOLISHED MATERIALS

- A. Remove demolition waste materials from Project site, dispose of them in an EPA-approved construction and demolition waste landfill acceptable to authorities having jurisdiction and recycle or dispose of them according to Section 01 74 19 "Construction Waste Management and Disposal."
 - 1. Do not allow demolished materials to accumulate on-site.
 - 2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
- B. Do not burn demolished materials.

3.10 CLEANING

- A. Clean adjacent structures and improvements of dust, dirt and debris caused by building demolition operations. Return adjacent areas to condition existing before building demolition operations began.
 - 1. Clean roadways of debris caused by debris transport.

END OF SECTION 024116

SECTION 024119 - SELECTIVE DEMOLITION

GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

- A. Section Includes:
 - 1. Demolition and removal of selected portions of building or structure.
 - 2. Demolition and removal of selected site elements.
 - 3. Salvage of existing items to be reused or recycled.
- B. Related Requirements:
 - 1. Section 011000 "Summary" for restrictions on use of the premises, Owner-occupancy requirements and phasing requirements.
 - 2. Section 017300 "Execution" for cutting and patching procedures.

1.03 DEFINITIONS

- A. Remove: Detach items from existing construction and dispose of them off-site unless indicated to be salvaged or reinstalled.
- B. Remove and Salvage: Detach items from existing construction, in a manner to prevent damage and deliver to Owner ready for reuse.
- C. Remove and Reinstall: Detach items from existing construction, in a manner to prevent damage, prepare for reuse and reinstall where indicated.
- D. Existing to Remain: Leave existing items that are not to be removed and that are not otherwise indicated to be salvaged or reinstalled.
- E. Dismantle: To remove by disassembling or detaching an item from a surface, using gentle methods and equipment to prevent damage to the item and surfaces; disposing of items unless indicated to be salvaged or reinstalled.

1.04 MATERIALS OWNERSHIP

- A. Unless otherwise indicated, demolition waste becomes property of Contractor.

1.05 PRE-INSTALLATION MEETINGS

- A. Pre-demolition Conference: Conduct conference at Project site.
 - 1. Inspect and discuss condition of construction to be selectively demolished.

2. Review structural load limitations of existing structure.
3. Review and finalize selective demolition schedule and verify availability of materials, demolition personnel, equipment and facilities needed to make progress and avoid delays.
4. Review requirements of work performed by other trades that rely on substrates exposed by selective demolition operations.
5. Review areas where existing construction is to remain and requires protection.

1.06 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For refrigerant recovery technician.
- B. Engineering Survey: Submit engineering survey of condition of building.
- C. Proposed Protection Measures: Submit report, including drawings, that indicates the measures proposed for protecting individuals and property for environmental protection, dust control and noise control. Indicate proposed locations and construction of barriers.
- D. Schedule of Selective Demolition Activities: Indicate the following:
 1. Detailed sequence of selective demolition and removal work, with starting and ending dates for each activity. Ensure Owners on-site operations are uninterrupted.
 2. Interruption of utility services. Indicate how long utility services will be interrupted.
 3. Coordination for shutoff, capping and continuation of utility services.
 4. Coordination of Owners continuing occupancy of portions of existing building and of Owners partial occupancy of completed work.
- E. Pre-demolition Photographs or Video: Show existing conditions of adjoining construction, including finish surfaces that might be misconstrued as damage caused by demolition operations. Comply with Section 013233 "Photographic Documentation." Submit before work begins.
- F. Statement of Refrigerant Recovery: Signed by refrigerant recovery technician responsible for recovering refrigerant, stating that all refrigerant that was present was recovered and that recovery was performed according to EPA regulations. Include name and address of technician and date refrigerant was recovered.
- G. Warranties: Documentation indicating that existing warranties are still in effect after completion of selective demolition.

1.07 CLOSEOUT SUBMITTALS

- A. Inventory: Submit a list of items that have been removed and salvaged.

1.08 QUALITY ASSURANCE

- A. Refrigerant Recovery Technician Qualifications: Certified by an EPA-approved certification program.

1.09 FIELD CONDITIONS

- A. Owner will occupy portions of building immediately adjacent to selective demolition area. Conduct selective demolition so Owners operations will not be disrupted.
- B. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.
- C. Notify Architect of discrepancies between existing conditions and drawings before proceeding with selective demolition.
- D. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work.
 - 1. Hazardous materials will be removed by Owner before start of the work.
 - 2. If suspected hazardous materials are encountered, do not disturb; immediately notify Architect and Owner. Hazardous materials will be removed by Owner under a separate contract.
- E. Hazardous Materials: Present in buildings and structures to be selectively demolished. A report on the presence of hazardous materials is on file for review and use. Examine report to become aware of locations where hazardous materials are present.
 - 1. Hazardous material remediation is specified elsewhere in the Contract Documents.
 - 2. Do not disturb hazardous materials or items suspected of containing hazardous materials except under procedures specified elsewhere in the Contract Documents.
 - 3. Owner will provide material safety data sheets for suspected hazardous materials that are known to be present in buildings and structures to be selectively demolished because of building operations or processes performed there.
- F. Storage or sale of removed items or materials on-site is not permitted.
- G. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.
 - 1. Maintain fire-protection facilities in service during selective demolition operations.

1.10 WARRANTY

- A. Existing Warranties: Remove, replace, patch and repair materials and surfaces cut or damaged during selective demolition, by methods and with materials and using approved contractors so as not to void existing warranties. Notify warrantor before proceeding. Existing warranties include the following:
- B. Notify warrantor on completion of selective demolition and obtain documentation verifying that existing system has been inspected and warranty remains in effect. Submit documentation at Project closeout.

1.11 COORDINATION

- A. Arrange selective demolition schedule so as not to interfere with Owners operations.

PRODUCTS

2.01 PERFORMANCE REQUIREMENTS

- A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.
- B. Standards: Comply with ASSE A10.6 and NFPA 241.

EXECUTION

3.01 EXAMINATION

- A. Verify that utilities have been disconnected and capped before starting selective demolition operations.
- B. Review Project Record Documents of existing construction or other existing condition and hazardous material information provided by Owner. Owner does not guarantee that existing conditions are same as those indicated in Project Record Documents.
- C. Engage a professional engineer to perform an engineering survey of condition of building to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of structure or adjacent structures during selective building demolition operations.
 - 1. Perform surveys as the work progresses to detect hazards resulting from selective demolition activities.
- D. Steel Tendons: Locate tensioned steel tendons and include recommendations for de-tensioning.
- E. Verify that hazardous materials have been remediated before proceeding with building demolition operations.
- F. Survey of Existing Conditions: Record existing conditions by use of pre-construction photographs or video.
 - 1. Comply with requirements specified in Section 013233 "Photographic Documentation."
 - 2. Inventory and record the condition of items to be removed and salvaged. Provide photographs or video of conditions that might be misconstrued as damage caused by salvage operations.
 - 3. Before selective demolition or removal of existing building elements that will be reproduced or duplicated in final work, make permanent record of measurements, materials and construction details required to make exact reproduction.

3.02 PREPARATION

- A. Refrigerant: Before starting demolition, remove refrigerant from mechanical equipment according to 40 CFR 82 and regulations of authorities having jurisdiction.

3.03 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

- A. Existing Services/Systems to Remain: Maintain services/systems indicated to remain and protect them against damage.
- B. Existing Services/Systems to Be Removed, Relocated or Abandoned: Locate, identify, disconnect and seal or cap off utility services and mechanical/electrical systems serving areas to be selectively demolished.
 - 1. Owner will arrange to shut off indicated services/systems when requested by Contractor.
 - 2. Arrange to shut off utilities with utility companies.
 - 3. If services/systems are required to be removed, relocated or abandoned, provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to other parts of building.
 - 4. Disconnect, demolish and remove fire-suppression systems, plumbing and HVAC systems, equipment and components indicated on drawings to be removed.
 - a. Piping to Be Removed: Remove portion of piping indicated to be removed and cap or plug remaining piping with same or compatible piping material.
 - b. Piping to Be Abandoned in Place: Drain piping and cap or plug piping with same or compatible piping material and leave in place.
 - c. Equipment to Be Removed: Disconnect and cap services and remove equipment.
 - d. Equipment to Be Removed and Reinstalled: Disconnect and cap services and remove, clean and store equipment; when appropriate, reinstall, reconnect and make equipment operational.
 - e. Equipment to Be Removed and Salvaged: Disconnect and cap services and remove equipment and deliver to Owner.
 - f. Ducts to Be Removed: Remove portion of ducts indicated to be removed and plug remaining ducts with same or compatible ductwork material.
 - g. Ducts to Be Abandoned in Place: Cap or plug ducts with same or compatible ductwork material and leave in place.

3.04 PROTECTION

- A. Temporary Protection: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.
 - 1. Provide protection to ensure safe passage of people around selective demolition area and to and from occupied portions of building.
 - 2. Provide temporary weather protection, during interval between selective demolition of existing construction on exterior surfaces and new construction, to prevent water leakage and damage to structure and interior areas.
 - 3. Protect walls, ceilings, floors and other existing finish work that are to remain or that are exposed during selective demolition operations.

4. Cover and protect furniture, furnishings and equipment that have not been removed.
 5. Comply with requirements for temporary enclosures, dust control, heating and cooling specified in Section 015000 "Temporary Facilities and Controls."
- B. Temporary Shoring: Design, provide and maintain shoring, bracing and structural supports as required to preserve stability and prevent movement, settlement or collapse of construction and finishes to remain and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.
1. Strengthen or add new supports when required during progress of selective demolition.
- C. Remove temporary barricades and protections where hazards no longer exist.

3.05 SELECTIVE DEMOLITION, GENERAL

- A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the work within limitations of governing regulations and as follows:
1. Proceed with selective demolition systematically, from higher to lower level. Complete selective demolition operations above each floor or tier before disturbing supporting members on the next lower level.
 2. Neatly cut openings and holes plumb, square and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping. Temporarily cover openings to remain.
 3. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
 4. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain portable fire-suppression devices during flame-cutting operations.
 5. Maintain fire watch during and for at least 24-hours after flame-cutting operations.
 6. Maintain adequate ventilation when using cutting torches.
 7. Remove decayed, vermin-infested or otherwise dangerous or unsuitable materials and promptly dispose of off-site.
 8. Remove structural framing members and lower to ground by method suitable to avoid free fall and to prevent ground impact or dust generation.
 9. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors or framing.
 10. Dispose of demolished items and materials promptly. Comply with requirements in Section 01 74 19 "Construction Waste Management and Disposal."
- B. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways and other adjacent occupied and used facilities.
- C. Removed and Salvaged Items:
1. Clean salvaged items.
 2. Pack or crate items after cleaning. Identify contents of containers.
 3. Store items in a secure area until delivery to Owner.

4. Transport items to Owners storage area designated by Owner.
 5. Protect items from damage during transport and storage.
- D. Removed and Reinstalled Items:
1. Clean and repair items to functional condition adequate for intended reuse.
 2. Pack or crate items after cleaning and repairing. Identify contents of containers.
 3. Protect items from damage during transport and storage.
 4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports and miscellaneous materials necessary to make item functional for use indicated.
- E. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Architect, items may be removed to a suitable, protected storage location during selective demolition, cleaned and reinstalled in their original locations after selective demolition operations are complete.

3.06 SELECTIVE DEMOLITION PROCEDURES FOR SPECIFIC MATERIALS

- A. Concrete: Demolish in sections. Cut concrete full depth at junctures with construction to remain and at regular intervals using power-driven saw and then remove concrete between saw cuts.
- B. Masonry: Demolish in small sections. Cut masonry at junctures with construction to remain, using power-driven saw and then remove masonry between saw cuts.
- C. Concrete Slabs-on-Grade: Saw-cut perimeter of area to be demolished and then break up and remove.
- D. Resilient Floor Coverings: Remove floor coverings and adhesive according to recommendations in RFCIs "Recommended Work Practices for the Removal of Resilient Floor Coverings." Do not use methods requiring solvent-based adhesive strippers.

3.07 DISPOSAL OF DEMOLISHED MATERIALS

- A. Remove demolition waste materials from Project site and dispose of them in an EPA-approved construction and demolition waste landfill acceptable to authorities having jurisdiction and recycle or dispose of them according to Section 017419 "Construction Waste Management and Disposal."
1. Do not allow demolished materials to accumulate on-site.
 2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
 3. Remove debris from elevated portions of building by chute, hoist or other device that will convey debris to grade level in a controlled descent.
 4. Comply with requirements specified in Section 017419 "Construction Waste Management and Disposal."
- B. Burning: Do not burn demolished materials.

3.08 CLEANING

- A. Clean adjacent structures and improvements of dust, dirt and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

END OF SECTION 024119

SECTION 033000 - CAST-IN-PLACE CONCRETE

GENERAL

1.01 SECTION INCLUDES

- A. Concrete formwork.
- B. Concrete for composite floor construction.
- C. Floors and slabs on grade.
- D. Concrete foundation walls.
- E. Concrete reinforcement.
- F. Joint devices associated with concrete work.
- G. Miscellaneous concrete elements, including equipment pads.
- H. Concrete curing.

1.02 RELATED REQUIREMENTS

- A. Section 033511 - Concrete Floor Finishes: Densifiers, hardeners, applied coatings, and polishing.
- B. Section 079200 - Joint Sealants: Products and installation for sealants and joint fillers for saw cut joints and isolation joints in slabs.

1.03 REFERENCE STANDARDS

- A. ACI CODE-318 - Building Code for Structural Concrete—Code Requirements and Commentary; 2025.
- B. ACI PRC-211.1 - Selecting Proportions for Normal-Density and High Density-Concrete - Guide; 2022.
- C. ACI PRC-302.1 - Guide to Concrete Floor and Slab Construction; 2015.
- D. ACI PRC-304 - Guide for Measuring, Mixing, Transporting, and Placing Concrete; 2000 (Reapproved 2009).
- E. ACI PRC-305 - Guide to Hot Weather Concreting; 2020.
- F. ACI PRC-306 - Guide to Cold Weather Concreting; 2016.
- G. ACI PRC-308 - Guide to External Curing of Concrete; 2016.
- H. ACI PRC-347 - Guide to Formwork for Concrete; 2014 (Reapproved 2021).
- I. ACI SPEC-301 - Specifications for Concrete Construction; 2020.
- J. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement; 2026.
- K. ASTM A775/A775M - Standard Specification for Epoxy-Coated Steel Reinforcing Bars; 2022.
- L. ASTM A820/A820M - Standard Specification for Steel Fibers for Fiber-Reinforced Concrete; 2016.
- M. ASTM A1064/A1064M - Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete; 2024.
- N. ASTM C33/C33M - Standard Specification for Concrete Aggregates; 2024a.
- O. ASTM C39/C39M - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens; 2024.

- P. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete; 2025.
- Q. ASTM C109/C109M - Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 50 mm [2 in.] Cube Specimens); 2024.
- R. ASTM C143/C143M - Standard Test Method for Slump of Hydraulic-Cement Concrete; 2020.
- S. ASTM C150/C150M - Standard Specification for Portland Cement; 2024.
- T. ASTM C171 - Standard Specification for Sheet Materials for Curing Concrete; 2020.
- U. ASTM C173/C173M - Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method; 2024a.
- V. ASTM C260/C260M - Standard Specification for Air-Entraining Admixtures for Concrete; 2024.
- W. ASTM C309 - Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete; 2025.
- X. ASTM C494/C494M - Standard Specification for Chemical Admixtures for Concrete; 2024.
- Y. ASTM C618 - Standard Specification for Coal Ash and Raw or Calcined Natural Pozzolan for Use in Concrete; 2025a.
- Z. ASTM C881/C881M - Standard Specification for Epoxy-Resin-Base Bonding Systems for Concrete; 2020a.
- AA. ASTM C1059/C1059M - Standard Specification for Latex Agents for Bonding Fresh to Hardened Concrete; 2024.
- BB. ASTM C1107/C1107M - Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink); 2020.
- CC. ASTM C1116/C1116M - Standard Specification for Fiber-Reinforced Concrete; 2023.
- DD. ASTM C1260 - Standard Test Method for Potential Alkali Reactivity of Aggregates (Mortar-Bar Method); 2021.
- EE. ASTM C1311 - Standard Specification for Solvent Release Sealants; 2022.
- FF. ASTM C1315 - Standard Specification for Liquid Membrane-Forming Compounds Having Special Properties for Curing and Sealing Concrete; 2025.
- GG. ASTM C1602/C1602M - Standard Specification for Mixing Water Used in the Production of Hydraulic Cement Concrete; 2022.
- HH. ASTM D1751 - Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Asphalt Types); 2023.
- II. ASTM D2103 - Standard Specification for Polyethylene Film; 2023a.
- JJ. ASTM D3963/D3963M - Standard Specification for Fabrication and Jobsite Handling of Epoxy-Coated Steel Reinforcing Bars; 2021.
- KK. ASTM E1155/E1155M - Standard Test Method for Determining FF Floor Flatness and FL Floor Levelness Numbers; 2023.
- LL. ASTM E1643 - Standard Practice for Selection, Design, Installation, and Inspection of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs; 2024.
- MM. ASTM E1745 - Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs; 2017 (Reapproved 2023).

1.04 SUBMITTALS

- A. See Section 013000 - Administrative Requirements for submittal procedures.
- B. Product Data: Submit manufacturers' data on manufactured products showing compliance with specified requirements and installation instructions.

- C. Mix Design: Submit proposed concrete mix design for each concrete mixture used on the Project. Provide mix identification designation with statement of intended use of for mix.
 - 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.
 - 4. Mix designs shall be received by the Architect not less than four weeks prior to the first concrete placement.
- D. Samples: Submit samples of underslab vapor retarder to be used.
- E. Test Reports: Submit report for each test or series of tests specified.
- F. Shop Drawings:
 - 1. Comply with requirements of ACI SP-66. Include bar schedules, shapes of bent bars, spacing of bars, and location of splices. Provide one continuous elevation at 1/4" scale for all beams & walls in a common line.
 - 2. Provide drawings showing construction and control joint locations along with the sequence of pours.
 - 3. Provide dimensioned drawings of foundation wall formwork.
 - 4. Reproduction of Contract Documents is not permitted.
- G. Material Certificates: For each of the following signed by manufacturer.
 - 1. Admixtures
 - 2. Curing compounds
 - 3. Vapor retarders
 - 4. Bonding agents
 - 5. Repair Material
 - 6. Adhesives
 - 7. Fiber Reinforcement
- H. Material Test Reports:
 - 1. If non-reactive aggregates are proposed, include service record data and test reports in accordance with ASTM C1260. Record data and test reports shall be dated within the past 12 months.
 - 2. If reactive aggregates are proposed, include test reports in accordance with ASTM C1567. Test reports shall be dated within the past 12 months and shall indicate compliance with the requirements set forth in the drawings.
- I. Field quality-control test and inspection reports.
- J. Placement notification: Advance notification of concrete placement; submit notification at least 24 hours in advance.
- K. Curing compound data demonstrating specified moisture loss performance.
 - 1. Evaporative retarder product and application data demonstrating performance.
- L. Project Record Documents: Accurately record actual locations of embedded utilities and components that will be concealed from view upon completion of concrete work.

1.05 QUALITY ASSURANCE

- A. Perform work of this section in accordance with ACI SPEC-301 and ACI CODE-318.
- B. Follow recommendations of ACI PRC-305 when concreting during hot weather.
- C. Follow recommendations of ACI PRC-306 when concreting during cold weather.
- D. Installer Qualifications: Company specializing in performing foundation and flatwork installation with at least five (5) years of documented experience with a record of successful in-service

performance on projects with similar size and complexity to this Project, with similar concrete materials and environmental conditions.

- E. Record of Work: Maintain a record listing the time and date of placement of all concrete for the structure. Retain batch tickets for all concrete. Such record shall be kept until the completion of the project and shall be available to the Architect for examination at any time.
- F. Source Limitations: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant, obtain aggregate, reactive or non reactive, from one source and obtain admixture through one source from a single manufacturer.

1.06 PRE-INSTALLATION MEETING

- A. A minimum of one week before starting work of this section, the Contractor shall conduct a Pre-Installation Meeting.
 - 1. Required Attendance:
 - a. General Contractor
 - b. Section 03 30 00 contractor(s) & relevant installers
 - c. Special Inspector
 - 2. The Architect, Structural Engineer, and Owner will also attend.
 - 3. Issues and procedures that shall be discussed at the Pre-Installation Meeting:
 - a. Special Inspection requirements
 - b. Aesthetic considerations
 - 4. The contractor shall prepare minutes of the meeting and shall furnish a copy to each attendee and others needing the information

PRODUCTS

2.01 FORMWORK

- A. Form Materials: Contractor's choice of standard products with sufficient strength to withstand hydrostatic head without distortion in excess of permitted tolerances.
 - 1. Form Facing for Exposed Finish Concrete: Contractor's choice of materials that will provide smooth, stain-free final appearance.
 - 2. Earth Cuts: Do not use earth cuts as forms for vertical surfaces. Natural rock formations that maintain a stable vertical edge may be used as side forms.
 - 3. Form Coating: Release agent that will not adversely affect concrete or interfere with application of coatings.
 - 4. Form Ties: Cone snap type that will leave no metal within 1-1/2 inches (38 mm) of concrete surface.

2.02 REINFORCEMENT MATERIALS

- A. Reinforcing Steel: ASTM A615/A615M, Grade 60 (60,000 psi) (420 MPa).
 - 1. Type: Deformed billet-steel bars.
 - 2. Finish: Unfinished, unless otherwise indicated.
 - 3. Finish: Epoxy coated in accordance with ASTM A775/A775M, unless otherwise indicated.
- B. Low-Alloy Steel Reinforcing Bars: Where field bending or welding of reinforcement is noted on the drawings provide ASTM A 706/ A 706M, deformed.
- C. Steel Welded Wire Reinforcement (WWR): Galvanized, plain type, ASTM A1064/A1064M.
- D. Reinforcement Accessories:
 - 1. Tie Wire: Annealed, minimum 16 gauge, 0.0508 inch (1.29 mm).
 - 2. Chairs, Bolsters, Bar Supports, Spacers: Sized and shaped for adequate support of reinforcement during concrete placement.

3. Provide plastic or plastic coated steel components for placement within 1-1/2 inches (38 mm) of weathering surfaces.
4. Coupler Systems: Mechanical devices for splicing reinforcing bars; capable of developing full steel reinforcing design strength in tension and compression.

2.03 CONCRETE MATERIALS

- A. Cement: ASTM C150/C150M, As Indicated on Drawings.
- B. Fine and Coarse Aggregates: ASTM C33/C33M.
 1. Acquire aggregates for entire project from same source.
- C. Fly Ash: ASTM C618, Class C or F.
- D. Water: ASTM C1602/C1602M; clean, potable, and not detrimental to concrete.
- E. Structural Fiber Reinforcement: Alkali-resistant polyolefin macro-fibers complying with ASTM C1116/C1116M.
 1. Fiber Length: 1" - 2 1/4" , nominal.
 2. Fiber Type: Alkali-resistant synthetic.
 3. For use in all exposed, unpolished slabs. Amount of fibers per manufacturer's recommendations to minimize shrinkage cracking.

2.04 ADMIXTURES

- A. Do not use chemicals that will result in soluble chloride ions in excess of 0.1 percent by weight of cement.
- B. Air Entrainment Admixture: ASTM C260/C260M.
- C. High Range Water Reducing and Retarding Admixture: ASTM C494/C494M Type G.
- D. High Range Water Reducing Admixture: ASTM C494/C494M Type F.
- E. Water Reducing and Retarding Admixture: ASTM C494/C494M Type D.
- F. Retarding Admixture: ASTM C494/C494M Type B.
- G. Water Reducing Admixture: ASTM C494/C494M Type A.
- H. Plasticizing and Retarding Admixture: ASTM C1017.

2.05 ACCESSORY MATERIALS

- A. Underslab Vapor Retarder:
 1. Accessory Products: Vapor retarder manufacturer's recommended tape, adhesive, mastic, prefabricated boots, etc., for sealing seams and penetrations.
 2. Products:
 - a. ISI Building Products; Viper VaporCheck II 15-mil (Class A): www.isibp.com/#sle.
 - b. W. R. Meadows, Inc; PERMINATOR Class A - 10 mils (0.25 mm): www.wrmeadows.com/#sle.
 - c. Substitutions: See Section 016000 - Product Requirements.
- B. Non-Shrink Cementitious Grout: Premixed compound consisting of nonmetallic aggregate, cement, water reducing and plasticizing agents.
 1. Grout: Comply with ASTM C1107/C1107M.
 2. Minimum Compressive Strength at 48 Hours, ASTM C109/C109M: 2,000 pounds per square inch (13.7 MPa).
 3. Minimum Compressive Strength at 28 Days: 7,000 pounds per square inch (48 MPa).

2.06 BONDING AND JOINTING PRODUCTS

- A. Latex Bonding Agent: Non-redispersable acrylic latex, complying with ASTM C1059/C1059M, Type II.
- B. Reglets: Formed steel sheet, galvanized, with temporary filler to prevent concrete intrusion during placement.
- C. Slab Isolation Joint Filler: 1/2-inch (13 mm) thick, height equal to slab thickness, with removable top section forming 1/2-inch (13 mm) deep sealant pocket after removal.
- D. Slab Construction Joint Devices: Combination keyed joint form and screed, galvanized steel, with rectangular or round knockout holes for conduit or rebar to pass through joint form at 6 inches (150 mm) on center; ribbed steel stakes for setting.

2.07 CURING MATERIALS

- A. Evaporation Reducer: Liquid thin-film-forming compound that reduces rapid moisture loss caused by high temperature, low humidity, and high winds; intended for application immediately after concrete placement.
 - 1. Products:
 - a. Nox-Crete Inc; Monofilm: www.nox-crete.com/#sle.
 - b. SpecChem, LLC; SpecFilm Concentrate or SpecFilm: www.specchemllc.com/#sle.
 - c. W. R. Meadows, Inc; Evapre or Evapre-RTU: www.wrmeadows.com/#sle.
 - d. Substitutions: See Section 016000 - Product Requirements.
- B. Curing Compound, Naturally Dissipating: Clear, water-based, liquid membrane-forming compound; complying with ASTM C309.
- C. Curing and Sealing Compound, Moisture Emission-Reducing, Membrane-Forming: Clear, liquid sealer for application to newly-placed concrete; capable of providing adequate bond for flooring adhesives, initially and over the long term; with sufficient moisture vapor impermeability to prevent deterioration of flooring adhesives due to moisture emission.
 - 1. Use this product to cure and seal all slabs to receive adhesively applied flooring or roofing.
 - 2. Comply with ASTM C309 and ASTM C1315 Type I Class A.
 - 3. VOC Content: Less than 100 g/L.
- D. Curing and Sealing Compound, Low Gloss: Liquid, membrane-forming, clear, non-yellowing acrylic; complying with ASTM C1315 Type 1 Class A.
 - 1. Vehicle: Water-based.
 - 2. Solids by Mass: 25 percent, minimum.
 - 3. VOC Content: OTC compliant.
- E. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9oz/sq. yd when dry.
- F. Moisture-Retaining Sheet: ASTM C171 polyethylene film or white burlap-polyethylene sheet.
- G. Water: Potable, not detrimental to concrete.

2.08 CONCRETE MIX DESIGN

- A. Proportioning Normal Weight Concrete: Comply with ACI PRC-211.1 recommendations.
- B. Concrete Strength: Establish required average strength for each type of concrete on the basis of field experience or trial mixtures, as specified in ACI SPEC-301.
 - 1. For trial mixtures method, employ qualified independent testing agency for preparing and reporting proposed mix designs.
- C. Admixtures: Add acceptable admixtures as recommended in ACI PRC-211.1 and at rates recommended or required by manufacturer.

- D. Fiber Reinforcement: Add to mix at rate of 1.5 pounds per cubic yard (0.89 kg per cu m), or as recommended by manufacturer for specific project conditions where required in Drawings.
- E. Normal Weight Concrete:
 - 1. Compressive Strength, when tested in accordance with ASTM C39/C39M at 28 days as indicated on Drawings.
 - 2. Supplementary Cementitious Material Content: Such as fly ash, pozzolan, ground granulated blast-furnace slag and silica fume. As indicated on Drawings.
 - 3. Water-Cement Ratio: Maximum 40 percent by weight.
 - 4. Maximum Aggregate Size: As indicated on Drawings.
 - 5. If aggregates are "potentially reactive" with alkalis based on the ASTM C 295 or ASTM C 1260 or ASTM C 1293 testing limits of Section 5.1 of "Guide Specification of Concrete Subject to Alkali-Silica Reactions" (2007 Portland Cement Association), compliance with Section 5.2 of "Guide Specification for Concrete Subject to Alkali-Silica Reactions" (2007 Portland Cement Association) must be established through ASTM C 1567 testing for proposed alternate concrete mixture. Submit test reports in accordance with Part I of this Specification.

2.09 MIXING

- A. Transit Mixers: Comply with ASTM C94/C94M. Furnish batch ticket information.
- B. Adding Water: If concrete arrives on-site with slump less than suitable for placement, do not add water that exceeds the maximum water-cement ratio or exceeds the maximum permissible slump.

EXECUTION

3.01 EXAMINATION

- A. Verify lines, levels, and dimensions before proceeding with work of this section.

3.02 PREPARATION

- A. Formwork: Comply with requirements of ACI SPEC-301. Design and fabricate forms to support all applied loads until concrete is cured and for easy removal without damage to concrete.
 - 1. Form openings, chases, offsets, depressions, recesses, keyways, reglets, blocking, screeds, and bulkheads required in the Work. Determine sizes and locations from trades providing such items.
- B. Verify that forms are clean and free of rust before applying release agent.
- C. Coordinate placement of embedded items with erection of concrete formwork and placement of form accessories.
- D. Where new concrete is to be bonded to previously placed concrete, prepare existing surface by cleaning and applying bonding agent in according to bonding agent manufacturer's instructions.
 - 1. Use epoxy bonding system for bonding to damp surfaces, for structural load-bearing applications, and where curing under humid conditions is required.
 - 2. Use latex bonding agent only for non-load-bearing applications.
- E. In locations where new concrete is doweled to existing work, drill holes in existing concrete, insert steel dowels and pack solid with non-shrink grout.
- F. Interior Slabs on Grade: Install vapor retarder under interior slabs on grade. Comply with ASTM E1643. Lap joints minimum 6 inches (150 mm). Seal joints, seams and penetrations watertight with manufacturer's recommended products and follow manufacturer's written instructions. Repair damaged vapor retarder before covering.

3.03 INSTALLING REINFORCEMENT AND OTHER EMBEDDED ITEMS

- A. Fabricate and handle epoxy-coated reinforcing in accordance with ASTM D3963/D3963M.
- B. Comply with requirements of ACI SPEC-301. Clean reinforcement of loose rust and mill scale, and accurately position, support, and secure in place to achieve not less than minimum concrete coverage required for protection.
- C. Install welded wire reinforcement in maximum possible lengths, and offset end laps in both directions. Splice laps with tie wire.
- D. Verify that anchors, seats, plates, reinforcement and other items to be cast into concrete are accurately placed, positioned securely, and will not interfere with concrete placement.
 - 1. Tolerance of Embedded Items: Comply with ACI 117
 - a. Anchor Rods
 - 1) Plumbness: Within +/- 1/16 inch (2 mm) over anchor rod projection
 - b. Embedded Plates and Weldments
 - 1) Location: +/- 1 inch (25 mm) vertical, +/- 1 inch (25 mm) horizontal.
 - 2) Plumb and Alignment: 1/4 inch in 12 inches (1:48).
 - 2. Install anchor rods, accurately located, to elevations required and complying with tolerances in Section 7.5 of AISC 303 "Code of Standard Practice for Steel Buildings and Bridges."
- E. Do not re-bend any reinforcing bars.
- F. Minimum concrete coverage: As indicated in Drawings.

3.04 PLACING CONCRETE

- A. Place concrete in accordance with ACI PRC-304.
 - 1. Consolidate placed concrete with mechanical vibrating equipment according to ACI 301
 - 2. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations to rapidly penetrate placed layer and at least 6 inches (150 mm) into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity. At each insertion, limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing mixture constituents to segregate.
- B. Place concrete for floor slabs in accordance with ACI PRC-302.1.
 - 1. Deposit and consolidate concrete in a continuous operation, within limits of construction joints, until placement of a panel or section is complete
 - a. Consolidate concrete during placement operations so concrete is thoroughly worked around reinforcement and other embedded items and into corners.
 - b. Maintain reinforcement in position on chairs during concrete placement.
 - c. Screed slab surfaces with a straightedge and strike off to correct elevations.
 - 1) Slabs supported by metal deck shall be gaged to provide the specified slab thickness over beams.
 - d. Slope surfaces uniformly to drains where required.
 - e. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane, before excess bleedwater appears on the surface. Do not further disturb slab surfaces before starting finishing operations
- C. Notify Architect not less than 48 hours prior to commencement of placement operations.
- D. Maintain records of concrete placement. Record date, location, quantity, air temperature, and test samples taken.
- E. Cold-Weather Placement: Comply with ACI 306.1
 - 1. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.

2. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in mixture designs
- F. Hot-Weather Placement: Comply with ACI 301
1. Maintain concrete temperature below 90 deg F (32 deg C) at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
 2. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade uniformly moist without standing water, soft spots, or dry areas.
- G. Ensure reinforcement, embedded parts, and formed construction joint devices will not be disturbed during concrete placement.
- H. Place concrete continuously without construction (cold) joints wherever possible; where construction joints are necessary, before next placement prepare joint surface by removing laitance and exposing the sand and sound surface mortar, by sandblasting or high-pressure water jetting.
- I. Finish floors level and flat, unless otherwise indicated, within the tolerances specified below.
- J. Water shall not be added to concrete on-site unless the batch ticket specifies the gallons of water that may be added without exceeding the water/cement ration.
1. Do not add water to concrete after adding high-range water-reducing admixtures to mixture
- K. Shrinkage: Shrinkage strain, determined in accordance with ASTM C 157 as amended and modified herein, shall not exceed the values below for each concrete class:
1. Amendments and modifications to ASTM C 157
 - a. Storage: After initial 24 hour comparator reading, specimens are placed back in lime saturated water until age of seven days. At seven days another comparator reading is taken. This reading is used as the base reading which is used to calculate percent shrinkage. The specimens are stored at 50% humidity and 73° F (23° C).
 - b. Test Reports: Report gage length (average of three) after 4, 7, 14, 28, and 56 days. In addition to the information required by ASTM C 157, Section 11, shrinkage test reports shall include gage lengths (initial length measurements) used to determine reported shrinkage strains
 2. 28 Day Shrinkage Strain: Shrinkage strains shall not exceed the following:
 - a. Concrete for slab-on-grade placed directly on vapor barrier: 0.046%.

3.05 SLAB JOINTING

- A. Locate joints as indicated on drawings.
- B. Anchor joint fillers and devices to prevent movement during concrete placement.
- C. Isolation Joints: Use preformed joint filler with removable top section for joint sealant, total height equal to thickness of slab, set flush with top of slab. Install per manufacturer's instructions.
 1. Install wherever necessary to separate slab from other building members, including columns, walls, equipment foundations, footings, stairs, and drains and as indicated on drawing
- D. Construction Joints in footings, stem walls, etc.: Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Architect
 1. Place joints perpendicular to main reinforcement. Continue reinforcement across construction joints unless otherwise indicated.
 2. Form keyed joints as indicated. Embed keys at least 1-1/2 inches (38 mm) into concrete
 3. Space vertical joints in walls as indicated. Locate joints beside pilasters integral with walls, near corners, and in concealed locations where possible. Locate at centerline of support or middle third of span.

- E. Contraction Joints in Slabs-on-Grade: Construct contraction joints for a depth equal to at least one-fourth of concrete thickness as follows at locations indicated on Drawings:
 - 1. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch- (3.2-mm-) wide joints into concrete when cutting action will not tear, abrade, or otherwise damage surface and before concrete develops random contraction cracks.
- F. Joints in Slabs-on-Metal Deck: Locate construction joints as shown on Drawings. For slabs with welded wire reinforcing, continue reinforcing through construction joint and lap in adjacent pour. For slabs without welded wire reinforcing, provide #4 bar 4 feet (1.2 m) in length spaced at 12 inches (300 mm) on center staggered along the joint. Do not provide control joints.

3.06 FLOOR FLATNESS AND LEVELNESS TOLERANCES

- A. Minimum F(F) Floor Flatness and F(L) Floor Levelness Values:
 - 1. Exposed to View and Foot Traffic: F(F) of 20; F(L) of 15, on-grade only.
 - 2. Under Thick-Bed Tile: F(F) of 20; F(L) of 15, on-grade only.
 - 3. Under Carpeting: F(F) of 25; F(L) of 20, on-grade only.
 - 4. Under Thin Resilient Flooring and Thinset Tile: F(F) of 35; F(L) of 25, on-grade only.
- B. Measure F(F) Floor Flatness and F(L) Floor Levelness in accordance with ASTM E1155/E1155M, within 48 hours after slab installation; report both composite overall values and local values for each measured section.
- C. Correct the slab surface if composite overall value is less than specified and if local value is less than two-thirds of specified value or less than F(F) 13/F(L) 10.
- D. Correct defects by grinding or by removal and replacement of the defective work. Areas requiring corrective work will be identified. Re-measure corrected areas by the same process.

3.07 CONCRETE FINISHING

- A. Repair surface defects, including tie holes, immediately after removing formwork.
- B. Unexposed Form Finish: Rub down or chip off fins or other raised areas 1/4 inch (6 mm) or more in height.
- C. Exposed Form Finish: Rub down or chip off and smooth fins or other raised areas 1/4 inch (6 mm) or more in height. Repair and patch tie holes and defects. Provide finish as follows:
- D. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a texture matching adjacent formed surfaces.
- E. Concrete Slabs: Finish to requirements of ACI PRC-302.1 and as follows:
 - 1. Surfaces to Receive Thick Floor Coverings: "Wood float" as described in ACI PRC-302.1; thick floor coverings include quarry tile, ceramic tile, and Portland cement terrazzo with full bed setting system.
 - 2. Surfaces to Receive Thin Floor Coverings: "Steel trowel" as described in ACI PRC-302.1; thin floor coverings include carpeting, resilient flooring, seamless flooring, resinous matrix terrazzo, thin set quarry tile, and thin set ceramic tile.
 - 3. Decorative Exposed Surfaces: Trowel as described in ACI PRC-302.1; take measures necessary to avoid black-burnish marks; decorative exposed surfaces include surfaces to be stained or dyed, pigmented concrete, surfaces to receive liquid hardeners, surfaces to receive dry-shake hardeners, surfaces to be polished, and all other exposed slab surfaces.
- F. In areas with floor drains, maintain floor elevation at walls; pitch surfaces uniformly to drains at 1:100 nominal.
- G. Concrete Polishing: See Section 033511.

3.08 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.
 - 1. High early strength concrete: Not less than four days.
- C. Surfaces Not in Contact with Forms:
 - 1. Slabs and Floors To Receive Adhesive-Applied Flooring: Curing compounds and other surface coatings are usually considered unacceptable by flooring and adhesive manufacturers. If such materials must be used, either obtain the approval of the flooring and adhesive manufacturers prior to use or remove the surface coating after curing to flooring manufacturer's satisfaction.
 - 2. Initial Curing: Start as soon as free water has disappeared and before surface is dry. Keep continuously moist for not less than three days by water ponding, water-saturated sand, water-fog spray, or saturated burlap.
 - a. Spraying: Spray water over floor slab areas and maintain wet.
 - b. Saturated Burlap: Saturate burlap-polyethylene and place burlap-side down over floor slab areas, lapping ends and sides; maintain in place.
 - 3. Final Curing: Begin after initial curing but before surface is dry.
 - a. Moisture-Retaining Sheet: Lap strips not less than 3 inches (75 mm) and seal with waterproof tape or adhesive; secure at edges.
 - 1) Cure for not less than seven days.
 - 2) Immediately repair any holes or tears during curing period using cover material and waterproof tape.
 - 3) Moisture-retaining-cover shall be inspected each day by Contractor. Any areas which do not show condensation on underside of cover or any slab areas which are not wet shall be immediately rewetted and cover replaced to prevent moisture loss.
 - 4) Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive floor coverings, receive liquid floor treatments, or exposed in the final condition.
 - b. Curing Compound: Apply in two coats at right angles, using application rate recommended by manufacturer.
 - 1) Manufacturer to certify curing compound will not interfere with bonding of floor covering used on Project.
 - 2) Removal: After curing period has elapsed, remove curing compound without damaging concrete surfaces by method recommended by curing compound manufacturer
 - c. Curing and Sealing Compound: Apply uniformly to floors and slabs indicated in a continuous operation as recommended by manufacturer. Recoat areas subjected to heavy rainfall within three hours after initial application. Repeat process 24 hours later and apply a second coat. Maintain continuity of coating and repair damage during curing period

3.09 FIELD QUALITY CONTROL

- A. An independent testing agency will perform field quality control tests, as specified in Section 014000 - Quality Requirements & 014533 - Code-required Special Inspections and Procedures
- B. Provide free access to concrete operations at project site and cooperate with appointed firm.
- C. Submit proposed mix design of each class of concrete to inspection and testing firm for review prior to commencement of concrete operations.

- D. Tests of concrete and concrete materials may be performed at any time to ensure compliance with specified requirements.
- E. Take one additional test cylinder during cold weather concreting, cured on job site under same conditions as concrete it represents.

3.10 DEFECTIVE CONCRETE

- A. Test Results: The testing agency shall report test results in writing to Architect and Contractor within 24 hours of test.
- B. Defective Concrete: Concrete not complying with required lines, details, dimensions, tolerances or specified requirements.
 - 1. Allow Architect and Structural Engineer to observe concrete surfaces upon removal of forms and prior to repair of surface defects. Defects in structural concrete shall be brought to the attention of the Architect and Structural Engineer
- C. Repair or replacement of defective concrete will be determined by the Architect. The cost of additional testing shall be borne by Contractor when defective concrete is identified.
- D. Do not patch, fill, touch-up, repair, or replace exposed concrete except upon express direction of Architect for each individual area.
 - 1. Submit proposed repair to Architect for review prior to commencement of work

3.11 PROTECTION

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

END OF SECTION 033000

SECTION 033100 - SITE CONCRETE WORK

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK:

- A. The extent of site concrete work as shown in the Plans including flatwork (sidewalks, curbs and gutters, valley pans, utility pads, dumpster pads, and other site features cast in place with Concrete) in conformity with the lines and grades, thicknesses, and typical cross sections shown in the Plans or established by the Architect/Engineer.
- B. It is the intent of this Section to allow machine laid or hand formed curb and gutter.

1.02 RELATED WORK:

- A. Document Revised Subsurface Exploration and Geotechnical Report Campbell County High School (Issued November 17, 2025): Geotechnical report; bore hole locations and findings of subsurface materials.
- B. City of Gillette Standard Construction Specifications (2025)
- C. Section 312316.13 - Trenching
- D. Section 312201 - Grading
- E. Section 321123 - Aggregate Base Courses
- F. Section 321300 - Concrete Pavement

1.03 REFERENCE STANDARDS:

- A. AASHTO M 6 - Fine Aggregate for Portland Cement Concrete.
- B. AASHTO M 182 - Standard Specification for Burlap Cloth Made from Jute or Kenaf and Cotton Mats.
- C. AASHTO M 213 - Standard Specification for Preformed Expansion Joint Fillers for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).
- D. AASHTO M 254 - Standard Specification for Corrosion-Resistant Coated Dowel Bars.
- E. ACI 301 - Specifications for Structural Steel.
- F. ACI CODE-318 - Building Code Requirements for Structural Concrete and Commentary.
- G. ACI CODE-350 - Code Requirements for Environmental Engineering Concrete Structures.
- H. ACI PRC-214 - Guide to Evaluation of Strength Test Results of Concrete.
- I. ACI PRC-304 - Guide for Measuring, Mixing, Transporting, and Placing Concrete.
- J. ACI PRC-305 - Guide to Hot Weather Concreting.
- K. ACI PRC-306 - Guide to Cold Weather Concreting.
- L. ACI PRC-315 - Guide to Presenting Reinforcing Steel Design Details.
- M. ACI SPEC-301 - Specifications for Concrete Construction.

- N. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon Steel Bars for Concrete Reinforcement.
- O. ASTM A1064/A1064M - Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete.
- P. ASTM C31/C31M - Standard Practice for Making and Curing Concrete Test Specimens in the Field.
- Q. ASTM C33/C33M - Standard Specification for Concrete Aggregates.
- R. ASTM C39/C39M - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens.
- S. ASTM C88/C88M - Standard Test Method for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate.
- T. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete.
- U. ASTM C125 - Standard Terminology Relating to Concrete and Concrete Aggregates.
- V. ASTM C131/C131M - Standard Method of Test for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.
- W. ASTM C136/C136M - Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
- X. ASTM C143/C143M - Standard Test Method for Slump of Hydraulic-Cement Concrete.
- Y. ASTM C150/C150M - Standard Specification for Portland Cement.
- Z. ASTM C156 - Standard Test Method for Water Loss [from a Mortar Specimen] Through Liquid Membrane-Forming Curing Compounds for Concrete.
- AA. ASTM C171 - Standard Specification for Sheet Materials for Curing Concrete.
- BB. ASTM C172/C172M - Standard Practice for Sampling Freshly Mixed Concrete.
- CC. ASTM C231/C231M - Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method.
- DD. ASTM C260/C260M - Standard Specification for Air-Entraining Admixtures for Concrete.
- EE. ASTM C309 - Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.
- FF. ASTM C494/C494M - Standard Specification for Chemical Admixtures for Concrete.
- GG. ASTM C595/C595M - Standard Specification for Blended Hydraulic Cements.
- HH. ASTM C618 - Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete.
- II. ASTM C920 - Standard Specification for Elastomeric Joint Sealants.
- JJ. ASTM C979/C979M - Standard Specification for Pigments for Integrally Colored Concrete.
- KK. ASTM C1116/C1116M - Standard Specification for Fiber-Reinforced Concrete.
- LL. ASTM D75/D75M - Standard Practice for Sampling Aggregates.

- MM. ASTM D994/D994M - Standard Specification for Preformed Expansion Joint Filler for Concrete (Bituminous Type).
- NN. ASTM D1751 - Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).
- OO. ASTM D1752 - Standard Specification for Preformed Sponge Rubber Cork and Recycled PVC Expansion Joint Fillers for Concrete Paving and Structural Construction.
- PP. ASTM D2628 - Standard Specification for Preformed Polychloroprene Elastomeric Joint Seals for Concrete Pavements.
- QQ. ASTM D4791 - Standard Test Method for Flat Particles, Elongated Particles, or Flat and Elongated Particles in Coarse Aggregate.
- RR. ASTM D5893/D5893M - Standard Specification for Cold-Applied, Single-Component, Chemically Curing Silicone Joint Sealant for Portland Cement Concrete Pavements.
- SS. ASTM D6690 - Standard Specification for Joint and Crack Sealants, Hot Applied, for Concrete and Asphalt Pavements.
- TT. CRSI MSP - Concrete Reinforcing Steel Institute, "Manual of Standard Practice".
- UU. CRSI RB4.1 - Supports for Reinforcement Used in Concrete.

1.04 QUALITY ASSURANCE:

- A. Codes and Standards: Comply with provisions of following codes, specifications and standards, except where more stringent requirements are shown or specified:
 - 1. ACI SPEC-301 "Specifications for Concrete Construction".
 - 2. ACI PRC-304 "Guide for Measuring, Mixing, Transporting, and Placing Concrete"
 - 3. ACI PRC-305 "Guide to Hot Weather Concreting"
 - 4. ACI PRC-306 "Guide to Cold Weather Concreting"
 - 5. ACI PRC-315 "Guide to Presenting Reinforcing Steel Design Details"
 - 6. ACI CODE-318 "Building Code Requirements for Reinforced Concrete".
 - 7. ACI PRC-347 "Guide to Formwork for Concrete"
 - 8. ACI CODE-350 "Environmental Concrete Structures"
 - 9. CRSI MSP Concrete Reinforcing Steel Institute, "Manual of Standard Practice".
- B. Concrete Mix Designs: Concrete mix designs shall be prepared for each type of concrete by an independent testing laboratory acceptable to the Architect/Engineer at the Contractor's expense. The mix designs shall be prepared in strict conformance with either the laboratory trial batch or field experience methods as defined by ACI SPEC-301. Subject to approval by Architect/Engineer this provision may be waived if the Contractor can show by previous testing and experience that the concrete will meet these Specifications. The concrete mix design submittal shall contain at a minimum the information as identified in Part 1 of this Section. No concrete is to be placed until the mix design is approved by the Architect/Engineer.
- C. Concrete Testing: The Contractor shall employ at his or her expense a testing laboratory acceptable to the Architect/Engineer to perform material evaluation tests and/or perform the mix design prior to placing any concrete. The Contractor will perform all acceptance testing during the on-site placement of the concrete as identified in Part 3 of this Section. Retesting or additional testing of concrete or materials failing to meet the requirements of these Specifications shall be done by the Contractor at no additional cost to the Owner.
- D. Do not change materials sources, type of cement, air-entraining agent, water reducing agent, other admixtures, or an aggregate without the Architect/Engineer's approval.

- E. In proportioning materials for mixing, use scales certified by the State of Wyoming. Do not use volume measurement except for water and liquid admixtures
- F. Do not change the quantity of cement per cubic yard from approved mix design without the written approval of Architect/Engineer.
- G. Use of admixture will not relax hot or cold weather placement requirements.
- H. Ready-mixed concrete to be in accordance with Alternate No. 3 of ASTM C94/C94M.

1.05 SUBMITTALS:

- A. See Section 013300 - Submittal Procedures, for submittal procedures.
- B. Product Data: Submit manufacturer's product data with application and installation instructions for proprietary materials and items, including reinforcement and forming accessories, admixtures, patching compounds, waterstops, joint systems, curing compounds, and others as requested by Architect/Engineer.
- C. Shop Drawings: Submit Shop Drawings for fabrication, bending, and placement of concrete reinforcement. Comply with ACI PRC-315 "Guide to Presenting Reinforcing Steel Design Details" showing bar schedules, stirrup spacing, diagrams of bent bars, and arrangement of concrete reinforcement. Include special reinforcement required and openings through concrete structures. Work to be done by a well-qualified detailer.
- D. Concrete Mix Design: Submit complete information qualifying that the proposed mix is in complete compliance with the concrete specified herein. The submittal shall contain but not be limited to the following:
 - 1. A table showing weights of all aggregate, cement, water and admixtures to be used for a yard of concrete.
 - 2. The water-cement ratio, calculated from the weights of water and cementitious materials in the mix design.
 - 3. Certification of aggregate compliance with these Specifications and source of supply and location. Certification to include gradation tests, wear and soundness tests.
 - 4. Admixture literature to certify compliance with these Specifications.
 - 5. Cement Mill Test Certification.
 - 6. Test reports indicating recent strength, air and slump performance for the proposed mix.
- E. Concrete Quality Charts. Comply with ACI PRC-214 and ACI 301 and submit the following:
 - 1. Specified strength (f_c')
 - 2. Required average strength (f_{cr})
 - 3. Compressive strength versus date of sample
- F. Aggregate Test Report: Submit for each aggregate source.
 - 1. Date of Test analysis
 - 2. Sieve Analysis
 - 3. Organic Impurities
 - 4. Sodium Sulfate Soundness Test
 - 5. Reactivity of Aggregate
 - 6. Complete identification of aggregate source of supply
- G. Samples: Submit samples of materials as specified and as otherwise requested by Architect/Engineer, including names, sources, and descriptions.

PART 2 - PRODUCTS

2.01 FORM MATERIALS:

- A. The Contractor shall be solely responsible for the adequacy of all forming, shoring and bracing design and construction. Any formwork installed by the Contractor shall be solely at Contractor's risk. The Architect/Engineer's review and/or approval will not lessen or diminish the Contractor's liability.
- B. Forms for Exposed Finish Concrete: Unless otherwise indicated, construct formwork for exposed concrete surfaces with plywood, metal, metal-framed plywood faced or other acceptable panel-type materials, to provide continuous, straight, smooth, exposed surfaces. Plastic forms shall not be used. Furnish in largest practicable sizes to minimize number of joints and to conform to joint system shown in the Plans. Provide form material with sufficient thickness to withstand pressure of newly placed concrete without bow or deflection. Aluminum will not be permitted.
- C. Forms for Unexposed Finish Concrete: Form concrete surfaces which will be unexposed in finished structure with plywood, lumber, metal or other acceptable material. Plastic forms shall not be used. Provide lumber dressed on at least 2 edges and one side for tight fit. Aluminum will not be permitted.
- D. Form Release Agent: Provide commercial formulation form release agent compounds that will not bond with, stain, nor adversely affect concrete surfaces requiring bond or adhesion, nor impede the wetting of surfaces to be cured with water or curing compounds. Surplus oil on forms and form oil on reinforcing steel and construction joints shall be removed before concrete is placed.
- E. Fillets for Chamfered Corners: Wood strips shall be installed to the dimensions shown on the plans.

2.02 REINFORCING MATERIALS:

- A. Reinforcing Bars (Rebar): ASTM A615/A615M , Grade 60, deformed.
- B. Steel Wire: ASTM A1064/A1064M, plain, cold drawn, steel. The wire for epoxy coated reinforcing shall be nylon, epoxy or plastic coated.
- C. Welded Wire Fabric (WWF): ASTM A1064/A1064M, welded steel wire fabric.
- D. Supports for Reinforcement: Provide supports for reinforcement including bolsters, chairs, spacers and other devices for spacing, supporting and fastening reinforcing bars and welded wire fabric in place. Bar supports shall conform to CRSI RB4.1 for stainless steel chairs, plastic spacers or plastic shim plates.
 - 1. Brick, broken concrete masonry units, spalls, rocks or similar materials shall not be used for support of reinforcing steel.
 - 2. For slabs on grade, use supports with sand plates or horizontal runners where base material will not support chair legs.
 - 3. For exposed to view concrete surfaces, where legs of supports are in contact with forms, provide supports with legs which are plastic protected (CRSI, Class or stainless steel protected (CRSI, Class 2).
- E. Plain Dowel Bars for Expansion Joints: In accordance with ASTM A615/A615M, 60 ksi yield grade steel.
 - 1. Epoxy coated in roadway pavement.
 - 2. Provide metal dowel so that one end of dowel permits longitudinal movement within the concrete section. Design caps with 1 end closed.
 - 3. Provide for movement equal to joint width plus 1/2 inch.

4. For load transfer bars, paint with 1 coat of paint conforming to AASHTO M 254 and coat 1/2 bar with g
- F. Fiber Reinforcing: The fiber shall be synthetic fibrous concrete reinforcement composed of 100% virgin polypropylene MD graded fibers containing no reprocessed olefin materials and shall be manufactur FIBERMESH or an approved equal. All fiber reinforcing shall be fibrillated and not less than 1 inch in size.
1. Specific gravity: 0.91
 2. Tensile Strength: 50 to 110 ksi
 3. Fibrous concrete reinforcement materials provided in this Section shall produce concrete conforming to the requirements for each type and class of concrete required, as indicated on the drawings and specified where the concrete is tested in accordance with ASTM C94/C94M and ASTM C1116/C1116M Type III 4.1.3 and ASTM C1116/C1116M.

2.03 CONCRETE MATERIALS:

- A. Portland Cement: Cement shall conform to the requirements of any of the following cement types:
1. ASTM C150/C150M:
 - a. Type II (Moderate Sulfate Resistance)
 - b. Do not use air entraining cement.
 2. ASTM C595/C595M (Blended Cement):
 - a. Type IL (Portland-Limestone Cement)
 3. For below ground concrete water system structures, other than thrust blocks, use Type II modified or Type V Portland cement.
 4. Use one brand of cement throughout the project, unless otherwise acceptable to Architect/Engineer. Certified mill certificates shall be furnished by the cement company and sent to the Architect/Engineer with every shipment.
- B. Normal Weight Concrete Aggregates: ASTM C33/C33M, and as herein specified. Provide aggregates from a single source for exposed concrete.
1. Local aggregates not complying with ASTM C33/C33M but which are shown by special test or actual service to produce concrete of adequate strength and durability may be used when acceptable to the Architect/Engineer.
 2. Fine Aggregates:
 - a. Fine Aggregate for concrete shall consist of sand and shall conform to the following ASTM requirements: ASTM C33/C33M, ASTM C136/C136M, and ASTM D75/D75M and AASHTO requirements: AASHTO M 6 as modified in this section.
 - b. General Composition: Concrete sand shall be composed of clean (washed), hard, durable, uncoated grains, free from injurious amounts of clay, dust, soft flaky particles, loam, shale, alkali, organic matter, or other deleterious matter.
 - c. Concrete fine aggregates shall meet the following gradation requirements:

% Passing By Weight		
Sieve	Minimum	Maximum
3/8"	100	--
No 4	95	100
No 16	45	80
No 30	25	60
No 50	10	30
No 100	2	10
No 200	0	4

- d. Material shall be well-graded and within the ranges stated above. For determining the degree of uniformity, a fineness modulus determination shall be made upon representative samples submitted by the Contractor from such sources as he proposes to use. Fine Aggregate from any one source having a variation in fineness modulus greater than 0.20 either way from a fineness modulus of the representative sample submitted by the Contractor, may be rejected. The fineness modulus is defined in ASTM C125.
- e. Deleterious Substances:
- 1) The fine aggregate shall not contain more than the following maximum amounts of deleterious substances:

	Maximum % of Weight
Clay Lumps	0.5
Coal, Lignite, or Shale	1.0
Material Passing No. 200 Sieve	4.0
 - 2) The sum of the above materials and other deleterious substances such as shale, alkali, mica, coated, grains, or soft and flaky particles, shall not exceed 4% by weight.
 - 3) Fine aggregate that conforms to the grading requirements of a specification prepared by another organization, such as a state agency, will also be acceptable.
3. Coarse Aggregate: Coarse aggregate for concrete shall consist of crushed stone or gravel and shall conform to the following requirements:
- a. General Composition:
 - 1) Broken stone shall consist of clean (washed), hard, tough, durable fragments of rock (excluding schist, shale, or slate) of uniform quality throughout, shall be free from an excess of soft, thin, or elongated pieces, disintegrated stone, lumps of clay, adherent films of clay, dirt, organic, or other injurious matter occurring either free or as a coating on the stone.
 - 2) Gravel shall consist of clean, hard, durable uncoated pebbles and shall be free from soft, thin, or laminated pieces, disintegrated stone, dirt, organic, or other injurious matter either free or as a coating on the gravel.
 - 3) Coarse aggregate shall not be obtained from sources of supply that contain appreciable percentages of material which are considered to have unsatisfactory expansive properties when it is combined with Portland Cement and water.
 - 4) Percent Crushed Stone: Not less than 50% of the coarse aggregate by weight shall have at least one (1) fractured face.
 - b. Sieve Analysis: The coarse aggregate shall be graded within one of the following limits. Aggregates for concrete shall be combined in proportions that will provide a mixture within the grading limits shown below. Contractor may also propose gradations that meet the Tarantula Curve utilizing either the Shilstone Coarseness Chart or Power 45 Chart aggregate proportioning methods. Not less than 50% of coarse aggregate, by weight, shall have at least one fractured face.

Nominal Size of Material	% Passing by Weight			
	1 1/2" Maximum (Grade 57)		3/4" Maximum (Grade 67)	
	Minimum	Maximum	Minimum	Maximum
Passing 1 1/2"	100	--	--	--
Passing 1"	95	100	100	--
Passing 3/4"	--	--	90	100
Passing 1/2"	25	60	--	--

Passing 3/8"	--	--	20	55
Passing No. 4	0	10	0	10
Passing No. 8	0	5	0	5

c. Deleterious Substances:

- 1) The coarse aggregate shall not contain more than the following maximum amounts of deleterious substances:

	<u>Max % of Weight</u>
Clay Lumps	0.5
Material Passing No. 200 Sieve	4.0
Coal, Lignite, or Shale	1.0
Other deleterious substances such as friable, thin, elongated, or laminated pieces	2.0

- 2) The sum of the above and other deleterious material shall not exceed 5% by weight.
- 3) Flat and elongated particles shall be determined using ASTM D4791, using a 1:5 ratio.

d. Soundness: When subjected to 5 cycles of the soundness test performed in accordance with ASTM C88/C88M, the loss in weight of the sampled coarse aggregate, complying with the specified gradation requirements, shall not exceed eighteen percent (18%) when magnesium sulfate is used or twelve percent (12%) when sodium sulfate is used.

e. Abrasion: The coarse aggregate shall not have an abrasive loss greater than forty percent (40%) as determined by ASTM C131/C131M.

- C. Fly Ash: Fly ash shall be Class F conforming to ASTM C618. Fly ash shall contain less than 1 percent by weight carbon and less than 3% by weight sulfur trioxide. Fly ash supplied during the life of the project shall have been formed at the same single source. Fly ash color shall not substantially alter the resulting concrete from the normal gray color and appearance. Maximum of 20% by weight of cement shall be replaced by Class F fly ash for all mix proportions listed in Subsection 2.5 of this Section. Fly ash shall replace cement at a ratio of the specific gravity of cement to the specific gravity of fly ash. The Contractor shall provide the Architect/Engineer with the chemical and physical analysis of the fly ash.

D. Water: Potable.

E. Admixtures:

- All admixtures to be used in concrete shall be subjected to prior approval by the Architect/Engineer.
- All admixtures used in any mix design shall be manufactured and supplied by the same manufacturer or shall be submitted with proof of compatibility.
- Air-Entraining Admixture: ASTM C260/C260M.
- Water-Reducing Admixture: ASTM C494/C494M, Type A, and contain not more than 1% chloride ions.
- Available Products: Subject to compliance with requirements, products which may be incorporated in the work include, but are not limited to, the following:
 - "Eucon WR-75"; Euclid Chemical Co.
 - "Pozzolith 322N"; Master Builders.
 - "Plastocrete 160"; Sika Chemical Corp.
 - "Chemtard"; Chem-Masters Corp.
- Calcium chloride is not permitted.

- F. Color Pigment: ASTM C979/C979M, synthetic mineral-oxide pigments or colored water-reducing admixtures; color stable, nonfading, and resistant to lime and other alkalis.

1. Color: As selected by the Architect/Engineer and Owner.

2.04 RELATED MATERIALS:

A. Joint Filler:

1. Preformed joint filler shall be 1/2-inch thick and conform to the requirements of AASHTO M 213, ASTM D994/D994M, ASTM D1751, or ASTM D1752 unless otherwise shown in the Plans, and shall be punched to admit the dowels where called for in the Plans.
2. The filler for each joint shall be furnished in a single piece for the full depth required for the joint unless otherwise authorized by the Architect/Engineer. When the use of more than one piece is authorized for a joint, the abutting ends shall be fastened securely and held accurately to shape by stapling or other positive fastening satisfactory to the Architect/Engineer.

B. Joint Sealers:

1. A mastic joint sealer material of uniform, stiff consistency that does not contain solvents.
 - a. The mastic shall tenaciously adhere to primed concrete surfaces, shall remain permanently mastic and shall not contaminate potable water.
 - b. The material shall be of a type that will effectively and permanently seal joints subject to movements in concrete.
2. Hot poured sealer for joints shall conform to the requirements of ASTM D6690, unless otherwise shown in the Plans.
3. Elastic joint sealer, where called for in the Plans, shall be two component polyurethane sealant meeting ASTM C920, Type M, Grade P, Class 25, Use TMO. Sealant for horizontal joints may be either Class A (self-leveling) or Class B (nonsag). Sealant for sloped or vertical joints shall be Class B.
4. Silicone Rubber Base joint sealant shall conform to ASTM D5893/D5893M Type NS or Type SL meeting the requirements of Dow Corning 888 or 890 Silicone Joint Sealant or approved equal.
5. Preformed compression joints shall be manufactured to the size and shape shown in the Plans, from materials conforming to the requirements of ASTM D2628. The Contractor shall furnish a certification for each shipment indicating that the material has been sampled, tested, and inspected in accordance with the provisions of ASTM D2628. Each certification so furnished shall be signed by an authorized agent of the manufacturer or independent testing agency. If recommended by the manufacturer, an approved lubricant-adhesive may be used to provide lubrication and bond for the joint. The lubricant shall be manufactured of material that is compatible with the sealer.

- C. Absorptive Cover: Burlap cloth made from jute or kenaf, weighing approximately 9 oz. per square yard, complying with AASHTO M 182, Class 2.

- D. Moisture-Retaining Cover: One of the following, complying with ASTM C171 :

1. Waterproof paper.
2. Polyethylene film.
3. Polyethylene-coated burlap.

- E. Liquid Membrane-Forming Curing Compound: Liquid type membrane forming curing compound complying with ASTM C309, pigmented or colored at time of application, non-toxic to potable water, and has a water retention of 0.01/Gr./Sq. CM as determined per ASTM C156 Standards.

- F. Bonding Compounds: 100% solids, nonsag two component material suitable for use on dry or damp surfaces.

1. Available Products: Subject to compliance with requirements, products which may be incorporated in the work include, but are not limited to, the following:
 - a. Epoxy resin bonding compounds shall be used for wet areas and shall be Adhesive Engineering, Concrese Nos. 1001, 1001-LPL or 1180 as applicable; Sika Chemical Corporation, Sikadur 35, Hi- Mod LV, Sikadur 32, Hi-Mod, or Sikadur 31, Hi-Mod Gel as applicable; Burke Company 881 LPL Epoxy; or equal.
 - b. Non-epoxy bonding compounds shall be used for dry areas and shall be Burke Company, Acrylic Bondcrete; Imperial Chemical Industrial, Inc., Thoro System Products, Acryl 60; Thorobond; or equal. Bonding compounds shall be applied in accordance with the manufacturer's instructions.

2.05 PROPORTIONING AND DESIGN OF MIXES:

- A. Prepare design mixes for each type and strength of concrete by either laboratory trial batch or field experience methods as specified in ACI SPEC-301. If trial batch method is used, use an independent testing facility acceptable to Architect/Engineer for preparing and reporting proposed mix designs.

1. Submit written reports to Architect/Engineer of each proposed mix for each class of concrete at least 15 days prior to start of work in accordance with Part 1 of this Section. Do not begin concrete production until mixes have been reviewed and approved by Architect/Engineer.
2. Design mixes to provide normal weight concrete with the following properties:

	CLASS A	CLASS B	FLOWABLE FILL
Specified Compressive Strength f_c' , minimum (28 DAY)	5000 PSI	4000 PSI	45-200 PSI
Compressive Strength, Minimum (7 DAY) (a)	4000 PSI	3200 PSI	40 PSI
Cement Content (94 lb sacks of Cement per cubic yard of Concrete), Minimum (b)	(c)	6 sacks	(e)
Entrained air content (% by column)	6.5% +/-1.5%	6.5% +/-1.5%	-
Slump range (in) (d)	1-5	1-5	(e)

(a) Used for monitoring purposes only

(b) Includes pozzolan replacements

(c) Cement content shall be appropriate to produce a mixture meeting the requirements for water/cement ratio and workability for the specific job conditions.

(d) Ensure that concrete with slump greater than 4 in contains a water reducing admixture (super-plasticizer)

(e) As determined in the mix design, not to exceed specified compressive strength.

- a. Class A: Concrete Pavement, Valley Pans, and Dumpster Pad
- b. Class B: Curb & Gutter, Sidewalk, Utility Pads, and all other uses except as noted
- c. Flowable Fill: Trench backfill/sewer line encasement
3. The maximum water to cement ration (w/c) shall be 0.45:1 for all mixes.

- B. Adjustment to Concrete Mixes: Mix design adjustments may be requested by Contractor when characteristics of materials, job conditions, weather, test results, or other circumstances warrant; at no additional cost to Owner and as accepted by Architect/Engineer. Laboratory test data for revised mix design and strength results must be submitted to and accepted by Architect/Engineer before using in work.
- C. Admixtures: Use air-entraining admixture in all concrete. Add air-entraining admixture at manufacturer's prescribed rate to result in concrete at point of placement having air content within following limits:
 - 1. 4% to 7% for maximum 1-1/2 inch aggregate.
 - 2. 4.5% to 7.5% for maximum 3/4 inch aggregate.
 - 3. Use admixtures for water-reducing and set-control in strict compliance with manufacturer's directions. The use of water reducing additives shall not permit a reduction in specified cement content.
- D. Slump Limits: Proportion and design mixes to result in concrete slump at point of placement as follows:
 - 1. Not less than 1 inch and not more than 5 inch.
 - 2. Concrete containing HRWR admixture (super plasticizer): 3 inch before and not more than 8 inch after HRWR addition.

PART 3 - EXECUTION

3.01 SUBGRADE & FOUNDATION PREPARATION

- A. Excavation for the construction shall be to the depth listed below the bottom of the concrete. See Section 312200 - Grading for required subgrade preparation. The excavation shall be as required to permit placing of site concrete features to the lines as shown in the plans.
- B. The base course upon which upon which the concrete is to be placed shall have a firm and even surface and shall be placed per Section 321123 - Aggregate Base Courses.

3.02 FORM WORK

- A. Site Flat Work:
 - 1. Forms, unless otherwise approved by the Architect/Engineer, shall be of sawn lumber of sound grade, plywood, or metal as approved by the Architect/Engineer and of a depth equal to the face of the item being constructed as shown in the Plans. No plastic forms shall be allowed. Forms in place shall be approved by the Architect/Engineer prior to the placement of concrete. Do not use material with raised grain, patches, or other defects, which will impair texture of concrete surface.
 - a. Design, erect, support, brace, and maintain formwork so that it will safely support vertical and lateral loads that might be applied, until such loads can be supported by the concrete structure.
 - b. Forms shall be designed to produce hardened concrete having the shape, lines and dimensions shown in the Plans. Forms shall be substantial and sufficiently tight to prevent leakage of mortar and shall be maintained in proper position and accurate alignment. Forms shall be thoroughly cleaned and oiled with an approved form oil before concrete is placed and shall not be removed until the concrete has hardened sufficiently to support all loads without damage.
 - c. Provide for openings, offsets, keyways, recesses, moldings, reglets, chamfers, blocking bulkheads, anchorages, inserts, and other features required. Use selected materials to obtain required finishes.

- d. Fit forms, placed in successive units for continuous surfaces to accurate alignment, free from irregularities, and within allowable tolerances.
- e. Where the curb and gutter is to abut an existing sidewalk, the Contractor shall use an approved face-to-gutter form secured in such a way so as to maintain an established gutter grade. The curb height may vary so that the top of the curb shall match as nearly as possible the standard curb and gutter cross section. Hand forming may be allowed by permission of the Architect/Engineer for lengths not exceeding 10 feet.
- f. Radii shall be formed using flexible or curved metal forms properly set to fit the required curvature. Wood forms may be used subject to the approval of the Architect/Engineer. Radii may be formed by using segments of straight forms, provided the length of the straight segment does not exceed one-tenth of the length of the radius.

3.03 REINFORCEMENT:

- A. Steel Reinforcing shall be cut and bent in accordance with ACI CODE-318 and CRSI MSP. Reinforcement shall be accurately formed to the dimensions indicated in the Plans and on the bending schedule. All bars shall be bent cold.
- B. Bar Spacing: The clear distance between parallel bars shall not be less than one bar diameter and, unless specifically authorized, shall in no case be less than one inch, nor less than the maximum size of coarse aggregate specified.
- C. Concrete Cover: Unless otherwise shown in the Standard Details or in the Plans all reinforcing shall have the minimum nominal cover as follows:
 - 1. Unformed Surfaces (crushed base, soil, etc.).....3 inch
 - 2. Formed Surfaces in Contact with Earth or Water
 - a. Conventionally reinforced #5 bars and smaller..... 1½ inch
 - b. Conventionally reinforced #6 through #18 bars.....2 inch
 - 3. Unformed surfaces in contact with water or weather.....2 inch
- D. No "Bury" or "Carrier" bars will be allowed unless specifically approved by the Architect/Engineer. "Chairs" shall be used to raise rebar. All "chairs" shall be approved by the Architect/Engineer.
- E. Comply with Concrete Reinforcing Steel Institute's recommended practice for *Placing Reinforcing Bars*, for details and methods of reinforcement placement and supports, and as herein specified.
- F. Clean reinforcement of loose rust and mill scale, earth, ice, and other materials which reduce or destroy bond with concrete.
- G. Accurately position, support and secure reinforcement against displacement by formwork, construction, or concrete placement operations. Locate and support reinforcing by metal chairs, runners, bolsters, spacers, and hangers, as required.
- H. Splicing:
 - 1. Except as shown or specified in the Plans, reinforcing steel shall not be spliced at any location without specific approval by the Architect/Engineer. Splices in adjacent bars shall be staggered.
 - 2. Where permitted or required, splices in reinforcing steel shall have sufficient lap to transfer full strength of the bar by bond and shear. Unless specified or shown otherwise in the Plans, the bars at a lap splice shall be in contact with each other.
 - 3. Unless specified or shown otherwise in the Plans, bars shall be lap spliced in accordance with ACI CODE-318 and shall be fastened together with steel tie wire.

4. Unless shown otherwise in the Plans, where bars are to be lap spliced at joints in the concrete, all bars shall project from the concrete first placed, a minimum length equal to the lap splice length indicated in the Plans. All concrete or other deleterious coating shall be removed from dowels and other projecting bars by wire brushing or sandblasting before the bars are embedded in a subsequent concrete placement.

I. Supports:

1. All reinforcement shall be retained in place, true to indicated lines and grades, by the use of approved bar supports.
2. The supports shall be of sufficient quantity, strength and stability to maintain the reinforcement in place throughout the concreting operations.
3. Supports must be completely concealed in the concrete and shall not discolor or otherwise mar the surface of the concrete.
4. The Contractor shall be held responsible for providing the appropriate quantity and type of bar supports.

J. Reinforcement Tolerances

1. Reinforcement shall be placed to the following tolerances:
 - a. Minimum spacing between parallel bars; shall be the diameter of the bar but not less than 1 inch.
 - b. Top bars in slabs and beams:
 - 1) Member 8 inches depth or less: +/- 3/8 inch
 - 2) Member greater than 8 inches depth: +/- 1/2 inch

K. Bar Tying:

1. Bars shall be tied sufficiently often to prevent shifting. There shall be at least 3 ties in each bar length (this shall not apply to dowel laps or to bars shorter than 4 feet, unless necessary for rigidity). Slab bars shall be tied at every intersection around the periphery of the slab. Wall bars and slab bar intersections shall be tied at not less than every fourth intersection, but at not greater than the following maximum spacings:

	Slab Bars (in)	Wall Bars (in)
Bars No. 5 & Smaller	60	48
Bars No. 6 through No. 9	96	60

3.04 JOINTS:

A. Site Flatwork:

1. Site flatwork shall be monolithically poured with no construction joints permitted, except at the location of a planned expansion joint.
 - a. Expansion joints shall be placed at radius points, construction joints, junctions with existing concrete as directed by Architect/Engineer, opposite to or at expansion joints in adjacent concrete, and at not more than 150 foot intervals in a continuous run of the item being constructed. Expansion joints shall be made using preformed expansion joint filler.
 - b. Contraction joints shall be formed to cut 1/8 inch wide to 1/4 of the depth of the item being placed. The joints shall be placed to coincide with the joints in adjacent concrete or else in uniform sections 10 feet in length. Where necessary in making a closure, sections less than 10 feet in length will be permitted, except the minimum length shall be 4 feet. When contraction joints are made by suitable forming or grooving before the concrete has set, the edges shall be tooled to acceptable radius.

3.05 INSTALLATION OF EMBEDDED ITEMS:

- A. General: Set and build into work anchorage devices and other embedded items required for other work that is attached to, or supported by, cast-in-place concrete. Use setting drawings, diagrams, instructions and directions provided by suppliers of items to be attached thereto.
- B. Edge Forms and Screed Strips for Slabs: Set edge forms or bulkheads and intermediate screed strips for slabs to obtain required elevations and contours in finished slab surface. Provide and secure screed strip units sufficiently strong to support types of screed strips by use of strike off templates or accepted compacting type screeds.

3.06 PREPARATION OF FORMED SURFACES:

- A. Coat contact surfaces of forms with a form-coating compound before reinforcement is placed. Thin form-coating compounds only with thinning agent of type, and in amount, and under conditions of form-coating compound manufacturer's directions. Do not allow excess form-coating material to accumulate in forms or to come in contact with reinforcing steel or concrete surfaces against which fresh concrete will be placed. Apply in compliance with manufacturer's instructions.
- B. Coat steel forms with a non-staining, rust-preventative form oil or otherwise protect against rusting. Rust-stained steel formwork is not acceptable.

3.07 CONCRETE PLACEMENT:

- A. Placing Concrete Slabs: Deposit and consolidate concrete slabs in a continuous operation, within limits of construction joints, until the placing of a panel or section is completed.
 - 1. Consolidate concrete during placing operations so that concrete is thoroughly worked around reinforcement and other embedded items and into corners.
 - 2. Bring slab surfaces to correct level and strike off with straightedge. Use bull floats or darbies to smooth surface, free of humps or hollows. Do not disturb slab surfaces prior to beginning finishing operations.
 - 3. Maintain reinforcing in proper position during concrete placement operations.
- B. Placing Site Flatwork:
 - 1. The subgrade shall be properly compacted and brought to specified grade before placing concrete. The base course shall be thoroughly dampened immediately prior to the placement of the concrete. Concrete shall be spaded and tamped thoroughly into the forms to provide a dense, compacted concrete free of rock pockets. The exposed surfaces shall be floated, finished and broomed.
 - a. The rate of concrete placement shall not exceed the rate at which the various placing and finishing operations can be performed in accordance with these Specifications.
 - b. The surface of concrete shall be finished true to the lines and grades shown in the Plans.
 - c. Concrete shall be worked until the coarse aggregate is forced down into the body of the concrete and no coarse aggregate is exposed. The surface shall then be floated with a wooden float to a smooth and uniform surface.
 - d. Concrete that is adjacent to forms and formed joints shall be edged with a suitable edging tool to the dimensions shown in the Plans.
 - e. Sidewalks: The cross slope of any concrete sidewalk shall not exceed 2% as measured with a 4 foot level that is capable of calculating slope with a digital readout. All concrete sidewalks must meet all current ADA Standards
 - f. Curb and Gutters: Honeycomb or other detrimental blemished in formed surfaces shall be filled with grout and satisfactorily finished. All edges shall be tooled to a 1/4 inch radius. The surface shall then be floated with a wooden float to a smooth and uniform surface.

3.08 COLD WEATHER CONCRETING PROCEDURES:

- A. Definition: Cold weather is defined as a period when for more than 3 successive days the mean daily temperature falls below 40°F or any day when the low temperature is expected to fall or falls below freezing (32°F).
- B. Cold Weather Placing: Protect concrete work from physical damage or reduced strength which could be caused by frost, freezing actions, or low temperatures, in compliance with ACI PRC-306 and as herein specified.
- C. Materials: Water and aggregates may be preheated for cold weather placement; however, their temperature shall not exceed 150°F. All methods and equipment for heating of water and aggregate shall conform to the requirements of ACI PRC-306. Concrete mixture at the point of placement shall have a temperature of not less than 50°F and not more than 90°F. Temperature tests at the job site shall confirm this requirement.
- D. Construction: No concrete shall contain frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or subgrade containing frozen materials. Placement shall be delayed until the ground has fully thawed out. When temperatures are expected to fall below 32°F the night before the concrete is placed, then all reinforcing steel, forms and the ground shall be preheated for a minimum of 12 hours at a minimum temperature of 50°F.
- E. Curing: When temperatures are expected to be below 32°F any time before the concrete has reached a strength of 1000 psi, the concrete must be adequately protected against frost damage by heating blankets, insulations blankets, straw or insulation materials for a minimum of 7 days. The concrete temperature shall at no time fall below 40°F based on recording temperature monitors placed at a maximum of 50 feet on centers, each way, and around the circumference of the street pavement area, floor, wall, roof slab and wall footing.
 - 1. Contractor shall provide heat and recording thermometer rated to be accurate to $\pm 1^\circ\text{F}$ as required to monitor the concrete temperature as specified throughout the entire curing period of 7 days. Thermometers shall record maximum and minimum temperatures. Daily temperature monitoring results shall be provided to the Architect/Engineer.
 - 2. When combustion type heaters are used to maintain concrete temperatures within an enclosure, the exhaust gases shall be vented from the heater to the outside atmosphere so that the concrete is not exposed to the products of combustion.

3.09 HOT WEATHER PLACING:

- A. Definition: Hot weather is defined as any combination of high air temperature, low relative humidity and wind tending to impair the quality of fresh or hardened concrete or otherwise resulting in abnormal concrete properties. During hot weather, any or all the methods specified in ACI PRC-305 shall be used to maintain the concrete temperature below the specified limits.
- B. Materials: Cool ingredients before mixing to maintain concrete temperature at time of placement below 90 °F. Mixing water may be chilled, or chopped ice may be used to control temperature provided water equivalent of ice is calculated into total amount of mixing water. Ice when introduced into the mixer shall be in such form that it will be completely melted and dispersed throughout the mix at the completion of the mixing time.
- C. Concrete Temperature: The temperature of concrete, as delivered at the time and location of placement, shall not exceed 100 °F under any conditions. The temperature of concrete as delivered at the time and location of placement, except for concrete deposited in wall or column forms, shall not exceed the following temperatures under the following ambient conditions:

RELATIVE HUMIDITY LESS THAN %	AMBIENT TEMPERATURE GREATER THAN °F	MAXIMUM CONCRETE TEMPERATURE °F
80	90	100
70	90	95
60	90	90
50	90	85
40	90	80
30	80	75
20	75	70

- D. Preparation for Placing: Forms and reinforcing steel shall be cooled by fog spraying evaporation or covering with water-soaked burlap immediately prior to placing concrete. Forms shall be free of standing water when concrete is placed.
- E. Placement: Concrete shall be placed in shallower layers than under normal conditions if necessary to assure coverage of the previous layer while it will respond readily to vibration.
- F. Protection and Curing: Fog spray shall be used after finishing and before the specified curing is commenced to avoid surface plastic-shrinkage cracking. Forms shall be kept covered and continuously moist. Once forms are loosened and during form removal, concrete surfaces shall be protected from drying and shall be kept continuously wet by fog spraying or other approved means until the specified curing is commenced.

3.10 SURFACE FINISHES:

- A. Rough Form Finish: For formed concrete surfaces not exposed-to-view in the finish work or by other construction, unless otherwise indicated. This is the concrete surface having texture imparted by form facing material used, with tie holes and defective areas repaired and patched and fins and other projections exceeding 1/4 inch in height rubbed down or chipped off.
- B. Smooth Form Finish: For formed concrete surfaces exposed-to-view, or that are to be covered with a coating material applied directly to concrete, or a covering material applied directly to concrete, such as waterproofing, dampproofing, or other similar system. This is as-cast concrete surface obtained with selected form facing material, arranged orderly and symmetrically with a minimum of seams. Repair and patch defective areas with fins or other projections completely removed and smoothed.
- C. Wood Float Finish: This requires an integral finish by wood-float after screeding, to compact the surface evenly. Any excess surface water shall be removed before floating and no mortar shall be used for leveling.
- D. Steel Trowel Finish: This shall be an integral finish obtained by troweling with a steel trowel after the surface has been floated and allowed to stand until all water-sheen has disappeared. Final troweling shall be done after the concrete has hardened sufficiently to prevent drawing moisture and fine materials to the surface and when the concrete is sufficiently hard that no mortar accumulates on the trowel. Cement, or mixture of cement and sand, shall not be spread on surfaces to absorb excess water or to stiffen the concrete. Troweling shall produce a dense, smooth, impervious surface free from defects and blemishes.
- E. Unformed Surfaces: Unformed surfaces which will not be exposed in the completed work shall be brought to required finished elevations and left true and regular.

- F. Broom Finish: Immediately after trowel finishing, slightly roughen concrete surface by brooming with a fiber bristle broom of an approved type to leave a fine uniformly scratched concrete surface. The strokes shall be square across the concrete from edge to edge with adjacent strokes overlapped. Strokes shall be made without tearing the concrete. The broomed finish shall produce regular corrugations not over 1/8 inch in depth.
- G. Tining: Refer to Section 321300 - Concrete Pavement.

3.11 FINISH SCHEDULE:

- A. Unless otherwise indicated in the Plans, concrete finishes shall be used as follows:
 - 1. Formed surfaces not exposed to view: Rough Form Finish
 - 2. Formed surfaces exposed to view: Smooth Form Finish
 - 3. Sidewalk, approaches, fillets, and valley pans: Broomed Surface Finish
 - 4. Portland Cement Concrete Pavement: See Section 321300 - Concrete Pavement.
 - 5. Water carrying structures: Steel Trowel Finish

3.12 PROTECTION:

- A. The Contractor shall always have materials available to protect the surface of the concrete against rain. These materials shall consist of waterproof paper or plastic sheeting.
- B. When concrete is being placed in cold weather, cold weather procedures shall be in accordance with subsection 3.8 of this Section. Any concrete damaged by freezing shall be removed and replaced at the Contractor's expense.

3.13 CURING:

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Start initial curing as soon as free water has disappeared from concrete surface after placing and finishing.
- B. Curing Methods: Perform curing of concrete by moist curing, by moisture- retaining cover curing, by curing compound, and by combinations thereof, as herein specified.
 - 1. All horizontal, screeded and floated surfaces, exposed to drying winds and sunlight, shall be sprayed with a curing compound in accordance with these Specifications at an application rate of 200 square foot per gallon or until the entire concrete surface is covered.
 - 2. All formed concrete surfaces shall be sprayed with a concrete curing compound in accordance with these Specifications at an application rate of 200 square foot per gallon or until the entire concrete surface is covered.

3.14 REMOVAL OF FORMS:

- A. Formwork not supporting weight of concrete, such as sides of curbs and gutter, sidewalks and similar parts of the work, may be removed after cumulatively curing at not less than 50°F (10°C) for 12 hours after placing concrete, provided concrete is sufficiently hard to not be damaged by form removal operations, and provided curing and protection operations are maintained.
- B. Formwork supporting weight of concrete, such as beam soffits, joints, slabs and other structural elements, may not be removed in less than 14 days and until concrete has attained design minimum 28 day compressive strength. Determine potential compressive strength of in-place concrete by testing field-cured specimens representative of concrete location or members.

- C. Form facing material may be removed 4 days after placement, only if shores and other vertical supports have been arranged to permit removal of form facing material without loosening or disturbing shores and supports.
- D. Do not pry against face of concrete. Use only wooden wedges.
- E. When repair or surface defects or finishing is required at an early age, remove forms as soon as concrete has hardened sufficiently to resist damage from removal operations.

3.15 MISCELLANEOUS CONCRETE ITEMS:

- A. Filling-In: Fill-in holes and openings left in concrete structures for passage of work by other trades, unless otherwise shown or directed, after work of other trades is in place. Mix, place and cure concrete as herein specified, to blend with in-place construction. Provide other miscellaneous concrete filling shown or required to complete work.

3.16 CONCRETE SURFACE REPAIRS:

- A. Patching Defective Areas: Repair and patch defective areas with cement mortar immediately after removal of forms.
 - 1. Cut out honeycomb, rock pockets, voids over 1/4 inch in any dimension, and holes left by tie rods and bolts, down to solid concrete but, in no case to a depth of less than 1 inch. Make edges of cuts perpendicular to the concrete surface. Thoroughly clean, dampen with water and brush-coat the area to be patched with specified epoxy bonding agent. Damp-pack with a mix of one part of cement to 2 parts of sand and fine gravel, epoxy and sand mix or combination of materials as approved by Architect/Engineer.
 - 2. The water content of the damp-pack material shall be such that a ball of the mix may be squeezed in the hand without bringing free water to the surface. Damp-pack material shall be tamped into place and finished to match adjacent concrete surfaces. Particular care shall be taken that no sagging of the material will occur. The bond between any two layers of damp-pack shall be improved through the use of an approved epoxy bonding agent. Surfaces which have been damp-packed shall be kept continuously damp during, and for a period of not less than seven days after completing the damp-pack operation, by the curing procedure in this Section. Under no circumstances shall Contractor apply a plaster coat over the honeycomb areas to conceal the existence of the honeycombing in the concrete.
- B. Repair of Formed Surfaces: Remove and replace concrete having defective surfaces if defects cannot be repaired to satisfaction of Architect/Engineer. Surface defects, as such, include color and texture irregularities, cracks, spalls, air bubbles, honeycomb, rock pockets; fins and other projections on surface; and stains and other discolorations that cannot be removed by cleaning.
 - 1. Repair concealed formed surfaces, where possible, that contain defects that affect the durability of concrete. If defects cannot be repaired, remove and replace concrete.
 - 2. Repair material shall be HD50, or approved equal.
- C. Form Tie Holes: Tie holes shall be thoroughly sandblasted or roughened. The tie holes shall then be coated with a water insensitive epoxy or an acceptable bonding agent and properly filled through damp-packing with a mortar of dry consistency and a mix of one part of cement to one part of plaster sand. The amount of water to be added to the cement-sand mix shall be such that the mortar can be driven into the voids and will compact properly. The outside of the tie hole shall be dry packed no sooner than 7 days after the inside has been dry packed.

3.17 BACKFILL:

- A. In areas where lawns exist, or as shown in the Plans, or as directed by the Architect/Engineer, the top 6 inches of backfill bringing its level up to the top of the concrete shall be black loam or good topsoil which is suitable for the growth of lawns. It shall be placed out from the concrete a sufficient distance and in an amount to replace turf or lawn removed during installation. The backfill shall be placed to a point level with the top of the concrete, immediately adjacent to the concrete, and shall be graded and blended to match the existing undisturbed lawn area.
- B. Where lawns are not required, the top 4 inches of backfill shall be crushed aggregate base course, unless another material is requested by the Architect/Engineer.
- C. Backfill shall be compacted to prevent settlement and the surface shall be leveled off to a neat appearing and free draining surface.
- D. Curb Backfill:
 - 1. Backfill the curb to a level of 5 inches below the top of curb with compacted clayey-type soil before final grading of the subgrade and placement of base courses, or as shown in the plans. Sand or gravel backfill in this area will not be permitted.
 - 2. Where lawns do not exist, the top 5 inches of backfill shall be clayey-type soil and shall be placed to conform to the typical detail(s) shown in the Plans.

3.18 TOLERANCES:

- A. The Work shall be performed in a manner which results in a sidewalk constructed to specified line and grade, uniform in appearance and structurally sound. Concrete found with unsightly bulges, ridges, low spots in the gutter or other defects shall be removed and replaced at the Contractor's expense if the Architect/Engineer considers them to be irreparable.
 - 1. Grade shall not deviate more than 1/4 inch, and alignment shall not vary more than 1/4 inch from Plan elevation, grade or alignment. Tolerances may be checked by use of survey instruments, straight edges, or water ponding. Ponding water shall not exceed 1/4 inch in depth.
 - 2. Any chips to the top or edge of the concrete or cracks in the concrete shall be repaired to the satisfaction of the Architect/Engineer, or replaced.
 - 3. All concrete sidewalk surfaces must meet all current ADA Standards.

3.19 QUALITY CONTROL TESTING DURING CONSTRUCTION:

- A. See 014000 - Quality Requirements, for general requirements for quality control.
- B. Owner will engage a qualified testing laboratory acceptable to the Architect/Engineer for quality testing during construction per Section 014000 - Quality Requirements.
- C. Testing laboratory shall provide Architect/Engineer with copies of all test reports on a daily basis during paving operations and prior to the start of the next day's production. All testing will be performed by an ACI certified technician.
- D. Sampling and testing for quality control during placement of concrete pavement will include the following, at a minimum but may include additional testing as determined by Architect/Engineer.
 - 1. Water-Cement Ratio: The actual water-cement ratio of the concrete, based on moisture content of aggregates and adjusted batch weights of water and cementitious materials, shall be determined and printed on the ticket of each load delivered to the jobsite.
 - 2. Slump, Air Content, Temperature, and Compressive Strength shall be performed for each 50 cubic yards, or any fraction thereof, placed in any one day.
 - a. Making and Curing Test Specimens in the Field: ASTM C31/C31M
 - b. Slump: ASTM C143/C143M

- c. Air Content: ASTM C231/C231M for normal weight concrete; one for each set of compressive strength test specimens.
- d. Concrete Temperature: Test hourly when air temperature is 40°F (4°C) and below, and when 80°F (27°F) and above; and each time a set of compression test specimens made.
- e. Compressive Strength: ASTM C39/C39M
 - 1) One set of 4 standard cylinders for each compressive strength test, unless otherwise directed. Hold and store cylinders or beams for laboratory cured test specimens except when field-cure test specimens are required.
 - 2) 1 specimen tested at 7 days, and 2 at 28 days with one held in reserve. Additional specimens may be required for field cure when conditions warrant.
 - 3) Strength level of concrete will be considered satisfactory if averages of sets of lab cured cylinders of three consecutive strength test results equal or exceed specified compressive strength, and no individual strength test result falls below specified compressive strength by more than 10%.
 - 4) Test results shall be reported in writing to Architect/Engineer and Contractor as soon as possible. Reports of compressive strength tests shall contain the project identification name and number, date of concrete placement, concrete type and class, location of concrete batch in structure, design compressive strength at 28 days, concrete mix proportions and materials; compressive breaking strength and type of break for the 7 day, and 28 day tests.

END OF SECTION 033100

SECTION 033500 – POLISHED CONCRETE

FINISHING PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: This Section specifies polished concrete.
- B. Related Sections:
 - 1. Section 033000 Cast-in-Place Concrete.
 - 2. Section 079200 Joint Sealants.

1.2 REFERENCES

- A. American Concrete Institute (ACI):
 - 1. ACI 302.1R Guide for Concrete Floor and Slab Construction.
- B. ASTM International:
 - 1. ASTM C309 Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.
 - 2. ASTM C171 Standard Specification for Sheet Materials for Curing Concrete.
 - 3. ASTM C779 Standard Test Method for Abrasion Resistance of Horizontal Concrete Surfaces.
 - 4. ASTM E 1155 Standard Test Method to Determine Floor Flatness and Levelness Using the F-Number System.
- C. Reunion Internationale des Laboratoires D'Essais et de Recherches sur les Matériaux et les Constructions (RILEM):
 - 1. Rilem Test Method 11.4 Standard Measurement of Reduction of Moisture Penetration Through Horizontal Concrete Surfaces.
- D. National Floor Safety Institute (NFSI):
 - 1. NFSI Test Method 101-A Standard for Evaluating High-Traction Flooring Materials, Coatings, and Finishes.
 - 2. ANSI Standards.
- E. Concrete Polishing Council (CPC)
- F. Sheet Metal and Air Conditioning National Contractors Association (SMACNA):
 - 1. IAQ Guidelines for Occupied Buildings Under Construction, 2nd Edition 2007, ANSI/SMACNA 008-2008 (Chapter 3) for Air Quality.

1.3 SYSTEM DESCRIPTION

- A. Performance Requirements: Provide exposed aggregate polished concrete flooring that has been designed, selected, manufactured and installed to achieve the following:

1. Floor Level: ASTM E 1155 Standard Test Method to Determine Floor Flatness and Levelness Using the F-Number System.
2. Abrasion Resistance: ASTM C779, Method A, high resistance, no more than 0.008 inch (0.20 mm) wear in 30 minutes.
3. Reflectivity: Determined by standard gloss meter.
4. Waterproof Properties: Rilem Test Method 11.4, 70% or greater reduction in absorption.
5. High Traction Rating: NFSI 101-A, ANSI B-101.1 2009 non-slip properties.

B. Design Requirements:

1. Hardened Concrete Properties:
 - a. Minimum Concrete Compressive Strength: Meet requirements indicated on Drawings and in Section 033000
 - b. Normal Weight Concrete: No lightweight aggregate.
 - c. Non-air entrained.
 - d. Maximum W/Cm ratio of .50.
2. Placement Properties:
 - a. Natural concrete slump: Meet requirements indicated on Drawings and in Section 033000
 - b. Flatness Requirements as identified in Section 033000.
3. Hard-Steel Troweled (3 passes) Concrete: No burnishing marks. Finish to ACI 302.1R, Class 5 floor.
 - a. Concrete placement.
 - 1) General Contractor and Installer shall strictly monitor each placement of concrete receiving special floor finishes.
 - 2) Follow special concrete finishing instructions for polished concrete placement, mandatory pre-construction meeting. Section 1.7D, QUALITY ASSURANCE.
4. Curing Options:
 - a. Membrane forming curing compounds (ASTM C309, Type 1, Class B, all resin, dissipating cure).
 - 1) Acrylic curing and sealing compounds NOT recommended.
 - 2) UV Dissipative curing compounds NOT recommended.
 - b. Sheet membrane (ASTM C171); polyethylene film NOT recommended.
 - c. Damp Curing with moisture retaining blankets: Seven-day cure.
 - d. Non-membrane forming curing compound, approved sodium silicate.

1.4 ACTION SUBMITTALS

- A. General: Submit in accordance with Contract Conditions and Section 013300 - Submittal Procedures.
- B. Preparation and Procedures:
 1. Description for protection of surrounding area:
 - a. Masonry and non-masonry surfaces.
 - b. Fixtures and existing finishes.
 - c. Exterior building perimeter.
 2. Detailed site-specific installation process:

- a. Site preparation and inspection.
 - b. Preparation and broadcasting of aggregates.
 - c. Detailed grinding schedule.
 - d. Joint filling protocol.
 - e. Defect and damaged substrate repair procedures.
 - f. Skim-coating/back-filling process including approved materials.
 - g. Perimeter hand grinding and polishing process.
 - 1) Inside corner and detail polishing.
 - h. Staining and dye application using approved products.
 - i. Densifier applications.
 - j. Honing and polishing process.
 - k. Cleaning and detailing procedures.
 - l. Final sealer/stain repellent.
 - m. Repairs to finished surface upon completion.
- C. Shop Drawings: Indicate information on shop drawings as follows:
- 1. Typical layout including dimensions and floor grinding schedule.
 - 2. Include locations of perimeter hand polishing and quantities. Denote aluminum door and window units, drains, clean-outs, inside corners, flooring transitions, electrical boxes, etc.
 - 3. Joint layout including dimensions.
- D. Equipment Storage and Mobilizations:
- 1. Prepare for multiple mobilizations.
 - a. Aggregate broadcasting.
 - b. Slab verification.
 - c. Contractor weekly meetings.
 - d. Early aggressive grinding as scheduled by Contractor.
 - e. Mobilize multiple times as the building's construction advances.
 - f. Final polishing mobilizations.
 - g. Perform Final cleaning, repairs and complete punch list items.
 - 2. Store tools onsite in container during construction. Provide lift when necessary to move equipment.

1.5 INFORMATIONAL SUBMITTALS

- A. Quality Assurance:
- 1. Test Reports: Certified test reports showing compliance with specified performance characteristics and physical properties as cited in Section 1.3, Design Requirements.
 - 2. Certificates:
 - a. Product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.
 - b. Letter of certification from the National Floor Safety Institute confirming the system has been tested and passed phase Two Level of certification when tested by Method 101-A. ANSI B-101.1 2009 non-slip properties.
 - c. Current contractor's certificate signed by manufacturer declaring contractor as an approved installer of approved Manufacturer's polishing products.

3. Manufacturer's installation instructions, technical data and process included in submittals.
4. Provide coefficient of friction slip testing on finished polished concrete by NSF1 Certified Third Party throughout building to include exterior entrances and corridors.

1.6 CLOSEOUT SUBMITTALS

- A. Warranty: Submit warranty documents as specified.
 1. Installer expected to perform all repairs and demonstrate procedures during Warranty Period.
- B. Operation and Maintenance Instruction: Submit operation and maintenance data for installed products in accordance with Section 017 700 - Closeout Procedures.
 1. Installer must provide:
 - a. Manufacturer's instructions for maintenance renewal of applied treatments.
 - b. Protocols and product specifications for joint repair, crack repair, surface staining, surface repair, etc.
 - c. Installer's on-site maintenance training upon Owner's acceptance completion.

1.7 QUALITY ASSURANCE

- A. Applicator Qualifications:
 1. Installer must provide 5-years of documented experience in performing specified work including 5 completed projects of similar size and complexity.
 2. Installer must specialize in the installation of "Exposed Aggregate" Polished Concrete Floors as required for this project.
 - a. These skills apply to changes which may increase this project's scope and complexity.
 - b. Installer must provide adequate equipment to demonstrate ability to successfully complete flooring installation according to Contractor's construction schedule.
 3. Installer must be trained and hold a current Installer Certificates for submitted products; Section 2.2, Polished Concrete Finishing Products.
 4. Manufacturer Qualifications: Manufacturer capable of providing field service representation during construction and approving application method.
- B. Regulatory Requirements:
 1. NFSI Test Method 101-A Phase Two Level High Traction Material.
- C. Manufacture Samples: Produce samples to determine the feasibility of producing a custom polished concrete floor without compromising the engineered parameters of the concrete while achieving the desired aesthetic goals.
 1. Develop a thorough understanding of the Design Team's intent for the Polished Concrete's desired appearance.
 2. Manufacture polished samples to replicate the Design Team's fundamental objective.

- a. Supply aggregate samples to demonstrate typical color, size, and texture of the stone.
 - b. Attempt to produce a light grey cement while keeping the mix design cost within a structured budget while experiencing no loss of mix design integrity.
 - c. Manufacture four different polished, 2-inch x 12-inch x 16-inch samples.
- 3. Deliver samples to the Architect, Design Team, Owner, Structural Engineer, Contractor and Concrete Supplier for comprehensive testing analysis and final selection.

- D. Mock-Up Directives:
 - 1. Location of mock-up is to be agreed upon by Owner and Architect. Area recommended should be in a low traffic area.
 - 2. Mock-Up Size: 100 ft² (9.3 m²) sample panel at jobsite at location as directed under conditions similar to those which exist during actual placement.
 - 3. Mock-up will be used to judge workmanship, concrete substrate preparation, operation of specified equipment, finished joint sealant, hand polishing and detailing, material application, final polished concrete appearance, clarity and shine.
 - 4. Allow 48 hours for inspection of mock-up. Do not proceed with remaining work until mock-up has approval by Architect and Contractor and is received in writing. When accepted, mock-up will demonstrate minimum standard of quality required for this work. Approved mock-up may remain as part of finished work.
 - 5. Demonstrate aggregate broadcasting as mock-up is being placed.
 - a. Coordinate with concrete installer to discuss site conditions.
 - b. Aggregate preparation.
 - c. Aggregate broadcasting.

- E. Mock-Up: Required to display the finished polished concrete's appearance.
 - 1. Aggregate characteristics.
 - a. Color of aggregate.
 - b. Size of aggregate.
 - c. Density of aggregate.
 - d. Availability of material.
 - 2. Cement characteristics.
 - a. Display color of cement.
 - b. Display aggregate to cement ratio.
 - c. Display the sand in the cement mix.
 - 3. Demonstrate typical joint sealants.
 - a. Control joint epoxy sealant.
 - b. Expansion joint urethane sealant.
 - 4. Mock-up to verify specified finishes are achieved.
 - a. Aggressively wet-grind substrate to expose full diameter of aggregate.
 - b. Skim-coat substrate surface to fill surface defects.
 - c. Wet-hone to produce clarity.
 - d. Densify and harden substrate thoroughly
 - e. Polish to 400-Grit "Matte Finish" or as directed.
 - f. Install sealer to help protect from staining.
 - 5. Demonstrate repairs in substrate with epoxy mortar and desired aggregate.

- F. Preinstallation Meetings: Conduct a preinstallation meeting to verify project requirements, manufacturer's installation instructions and manufacturer's warranty requirements. Require attendance of parties directly affecting work of this Section; including the Owner, Contractor, Architect, Structural Engineer, concrete batch plant representative, concrete installer, polished concrete installer.
1. Review the following with Contractor and in Contractor's weekly meetings:
 - a. Environmental requirements.
 - b. Scheduling and phasing of work.
 - c. Special Instruction during placement of concrete in polished areas.
 - d. Coordination with other work and personnel.
 - e. Remind all trades that they are working on a finished surface.
 - f. Protection of concrete prior to polishing.
 - g. Monitoring tires on all lifts, rolling carts and similar rubber tires.
 - h. Protection of adjacent surfaces.
 - i. Repair defects and defective work prior to installation.
 - j. Cleaning and surface maintenance.
 - k. Ice and procedures to protect freezing concrete surfaces.
 - l. Installation procedures of polished floor finishes.
 - m. Application of liquid hardener, densifier and curing products.
 - n. Place NO materials on concrete surface that may cause staining, etching or damage.

1.8 DELIVERY, PROTECTION, STORAGE & HANDLING

- A. Ordering: Comply with manufacturer's ordering instructions and lead time requirements to avoid construction delays.
- B. Delivery:
1. Deliver materials in manufacturer's original packaging with identification labels and seals intact.
 2. Inspect all materials immediately upon receipt for damage or missing items.
 3. Store materials protected from exposure to harmful weather conditions and at temperature conditions recommended by manufacturer.
 4. Maintain a record of all purchases and deliveries for products used during installation.
- C. Protection:
1. Protect concrete slab during construction prior to polishing concrete.
 - a. Protect from petroleum stains during construction.
 - b. Do not use salts to melt ice.
 - c. Do not chisel ice from concrete receiving special concrete finishes.
 - d. Diaper hydraulic power equipment.
 - e. Remove screws and nails immediately from scissor lift wheels.
 - f. Restrict use of pipe cutting and associated machinery.
 - g. Protect from tile mastic, paint, flooring glue, caulking, etc.
 - h. Do not use tape to secure floor protection to the concrete.
 - i. Restrict placement of reinforcing steel, steel or wood studs, etc. on slab.

- j. Restrict vehicular parking.
- k. Do not allow acidic detergents near masonry walls above concrete slabs.

D. Waste Management and Disposal:

- 1. Separate waste materials for Reuse and Recycling in accordance with Section 017419 - Construction Waste Management and Disposal.
- 2. Remove from site and dispose of packaging materials at appropriate recycling facilities.
- 3. Slurry Separators shall be used to remove dry cake solids and recycle waste water.
 - a. Comply with all regulatory compliance when disposing grinding slurry.

1.9 PROJECT AMBIENT CONDITIONS

- A. Installation Location: Comply with manufacturer's written recommendations.
- B. Temperature Limitations:
 - 1. Do not apply when surface and air temperature are below 45 degrees F or above 85 degrees F unless otherwise indicated by manufacturer's written instructions.
 - 2. Do not apply when surface and air temperatures are not expected to remain above 40 degrees F for a minimum of 8 hours after application, unless otherwise indicated by manufacturer's written instructions.
- C. Temporary Lighting: Minimum 200 W light source, placed 8 feet above horizontal concrete surface, for each 425 SF of concrete being finished.
- D. Ventilation: Provide ventilation during coating evaporation stage in confined or enclosed areas in accordance with manufacturer's instructions.

1.10 SEQUENCING

- A. Sequence Process with Other Work: Comply with manufacturer's written recommendations for sequencing construction operations.
- B. Aggregate Broadcasting: Coordinate with concrete placement, initial finishing and concrete curing.
- C. Aggressive Grinding: Coordinate aggressive grinding and skim-coating with Contractor to insure ability to work near steel erectors, framers and other trades with similar scheduling.
- D. Concrete Polishing: Coordinate final honing and polishing through Contractor with framers, drywall hangers and finishers, painters, electricians, ceiling grid and other trades with similar scheduling to insure all trades progress as scheduled.
- E. Attend Contractor's weekly job progression meetings continuously through the building's completion.

1.11 WARRANTY

- A. Project Warranty: Refer to Contract Conditions for project warranty provisions.
- B. Manufacturer's Warranty: Submit, for Owner's acceptance, manufacturer's standard warranty document executed by authorized company official. Manufacturer's warranty is in addition to, and does not limit, other rights Owner may have under Contract Documents.
- C. ONE YEAR WARRANTY: Commencing on date of acceptance by Owner.

1.12 MAINTENANCE

- A. Comply with manufacturer's written instructions to maintain installed product.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Ensure manufacturer has minimum 5-years of experience in manufacturing similar to or exceeding requirements of this project.
- B. Request for Substitutions will be considered in accordance with provisions of Section; 016000.

2.2 POLISHED CONCRETE FINISHING PRODUCTS

- A. Basis of Design Manufacturer:
 - 1. Manufacturer: L&M Chemicals, Inc., a brand of Laticrete International, Inc, 14851 Calhoun Rd., Omaha, NE 68152-1140; Telephone: (800) 362-3331, (402) 453-6600; Fax: (402) 453-0244; website: www.fgs-permashine.com; E-mail: info@lmcc.com.
 - 2. Manufacturer: Advanced Floor Products Inc.; RetroPlate System
Contact: RetroPlate System, PO Box 50533, Provo Utah 84605; Telephone: (888) 942- 3144, Fax: (801) 812-3400; website: www.retroplate.com.
 - 3. Manufacturer: Metzger/McGuire Co., Concord, NH(800)223-6680, P.O. Box 2217, Concord, NH 03302, Physical Address; 807 Route 3-A, Bow, NH 03304.
 - 4. Manufacturer: Sika Corporation, 201 Polito Avenue, Lyndhurst, NJ 07071, Telephone: 1- 800-933-SIKA, <https://usa.sika.com>.
- B. Basis of Design Products:
 - 1. Hardener, Sealer, Densifier: Proprietary, water based, odorless liquid, VOC compliant, environmentally safe chemical hardening solution leaving no surface film.
 - a. Acceptable Material: L & M Construction Chemicals, Inc., FGS Hardener

- Plus.
 - b. Acceptable Material: Advanced Floor Products Inc., RetroPlate System.
- 2. Rigid Joint Sealant: Semi-rigid, 2-component, self-leveling, 100% solids, rapid curing, epoxy control joint and crack filler with Shore A90 or higher hardness.
 - a. Acceptable Material: Metzger/McGuire Co., MM-80 available in standard colors.
- 3. Flexible Joint Sealant: Premium-grade, polyurethane-based elastomeric sealant, principally a chemical cure in a non-sag consistency. Meets ASTM C 920, Type M, Grade NS or SL.
 - a. Acceptable Material: Sikaflex-2c NS TG. Available in 35 standard colors.
- 4. Cleaning Solution: Proprietary, mild, highly concentrated liquid polished concrete cleaner and conditioner containing wetting and emulsifying agents; biodegradable, environmentally safe and certified High Traction by National Floor Safety Institute (NFSI).
 - a. Acceptable Material: FGS Concrete Conditioner, L & M Construction Chemicals Inc.
 - b. Acceptable Material: Retro Clean; RetroPlate Systems.
- 5. Stain Guard Sealer: 100% reactive, waterborne silane-siloxane sealer. This clear, penetrating, breathable water repellent is ideal for use on interior and exterior surfaces.
 - a. Acceptable Material: L&M AQUAPEL Plus

2.3 SOURCE QUALITY CONTROL

- A. Attempt to use concrete finishing components and materials from single manufacturer.
 - 1. Confirm products from different manufacturers are compatible when used together.
- B. Procure decorative aggregate from a single source.
 - 1. Confirm uniform color throughout all aggregate.
 - 2. Wash and maintain clean aggregate for broadcasting.
 - 3. Verify all aggregate is uniform in size.
 - 4. Take delivery of all required aggregate in one delivery, possibly several loads.

PART 3 - EXECUTION

3.1 MANUFACTURERS INSTRUCTIONS

- A. Compliance: Comply with manufacturer's written data, including product technical bulletins, product installation instructions, product carton installation instructions and manufacturer's data sheets.
- B. Use only certified installers (Basis of Design) or manufacturer's certified installers for approved products.

3.2 AGGREGATE PROTOCOL

- A. Verify correct aggregate size and color.
- B. Take delivery of all required aggregate at once and store on site in area where it will remain through all concrete placement.
- C. Prepare necessary aggregate required for each individual concrete placement.
 - 1. Provide shop drawings and mark areas scheduled to be seeded.
 - 2. Fill containers with predetermined volume of special aggregate determined from mock-up, testing and practicing.
 - 3. Thoroughly wash all aggregate prior to broadcasting to insure no contamination is introduced into the concrete during the seeding of the slab
 - 4. Coordinate and continuously communicate with workers seeding rock, workers stocking rock, concrete screed operators, concrete foreman and bowl float operator and General.
 - 5. As concrete is being placed, screed and place concrete with no deviation or delays.
 - 6. Broadcast rock over screed into freshly screeded concrete prior to being bowl floated.
 - 7. Disrupt concrete workers as little as possible by using aggregate stockers and experienced seeders.
 - 8. Bowl float the seeded aggregate into the cream and finish the concrete as specified, providing a 3-pass, hard steel troweled finish.
 - 9. Hand trowel professionals shall provide a hard troweled 2-pass (minimum) finish being careful not to double track while using knee boards.

3.3 EXAMINATION

- A. Site Verification of Conditions:
 - 1. Verify that concrete substrate conditions, which have been installed under other sections or contracts, are acceptable for product installation in accordance with manufacturer's instructions prior to installation of concrete finishing materials.
- B. Verify Concrete Slab Performance Requirements:
 - 1. Verify concrete is cured to 28-day strength as required in Contract Documents
 - 2. Verify concrete surfaces received a hard steel-trowel finish (3 passes) during placement.
 - 3. Confirm concrete surface flatness and levelness was verified 24 hours after placement.
 - 4. Verify, inspect and record concrete surface for flatness and levelness.
 - 5. Verify and record control joint and cold joint flatness, note excessive joint curling.
 - 6. Verify hydronic heating components, electrical fixtures, drains or clean-outs, or similar imbedded features are installed correctly.
- C. Communicate any issues or problems with the Contractor responsible for documenting, observing, managing the job site during the placement of concrete.

3.4 PREPARATION

- A. Ensure surfaces are clean, free of dirt and other foreign matter that may interfere with penetration or performance of specified products. Use only appropriate concrete cleaners in Section 2.2B Products, approved by the concrete surface treatment manufacturer. Rinse thoroughly using water, auto-scrubber or pressure spray to remove cleaner residues. Allow surfaces to dry completely before application of product.
- B. Repair cracks, voids, defects and damaged areas with an epoxy mortar as directed and approved by the Architect or Contractor. Allow repair material to cure completely before application of product. Note repairs and directives in Daily Reports.
- C. Texture and color variations in finished, troweled surface, will affect final appearance.
- D. Seal all open sawn control joints per Section 079200 prior to grinding application.
 - 1. Re-saw sawn control joints with dustless crack saw prior to application.
 - 2. Protect substrate from ghosting with soap or other means if necessary.
 - 3. Insure all excess material is removed from surface before polishing.
 - 4. Protect adjacent surfaces and keep the mixing area clean.

3.5 INSTALLATION

- A. Preliminary concrete polishing preparation.
 - 1. Provide polished concrete floor treatment over entirety of slab indicated by shop drawings.
 - 2. Apply floor finish prior to installation of fixtures and accessories.
 - 3. Coordinate with all affected trades in areas to receive floor treatment one week prior to installation.
 - 4. Thoroughly mask and protect all adjacent fixtures and finished surfaces.
 - 5. Concrete must be structurally sound and clean of all dirt, laitance, contaminants, oil, existing coatings or membrane curing compounds before application.
 - 6. Re-saw sawn control joints with dustless crack saw to expose clean vertical substrate. Refer to Approved Manufacturer's specification for installation of semi-rigid epoxy sealant.
 - 7. Fill sawn joint with semi-rigid epoxy joint sealant. Shave joint flush to substrate prior to beginning grinding operations.
 - 8. Prepare slurry separator to receive grinding slurry.
 - a. Provide written solid waste and recycled water site specific protocol to Contractor and Architect.
 - b. Strictly adhere to local, State and Federal law for recycling and disposal of waste.
 - c. Provide alternate methods for slurry handling if separator is temporary disabled.
 - d. Provide specific area to process grinding slurry and protect from through traffic.
 - 9. Prepare grinding equipment to aggressively wet-grind on pre-assigned, designated areas.

- a. Power disc machines must be appropriate for the size and complexity of specified floor finishes.
 - b. Secure necessary electrical power using an assigned Electrician to power designated temporary panel for specific use with power disc machine and associated floor finish equipment.
 - c. Secure water source for use by floor finish contractor.
 - 1) Provide Contractor written on-site plan for use of water and possible water source flooding remediation.
 - 9. Strictly adhere to OSHS Silica Dust Guidelines including use of mandated PPE.
- B. Begin initial floor finish installation.
- 1. Begin aggressively grinding substrate with power disk machine. Installer to determine the optimum starting grit and tooling in order to achieve the specified aggregate exposure. Sequence with coarse to fine grit.
 - a. Expose aggregate evenly in all contiguous areas receiving floor treatment as determined by approved mock-up.
 - b. Comply with diamond tooling manufacturer's recommended polishing grits for each sequence to achieve highest refinement before moving on to the next grit level.
 - c. Finish perimeter edges, fixture bases, thresholds and areas adjoining other materials with hand grinders, in a clean and sharp manner.
 - d. All concrete surfaces shall be as uniform in appearance as possible.
 - e. Substrate shall be thoroughly scrubbed between each grit pass to remove all loose material.
- C. Continue intermediate floor finish installation.
- 1. Thoroughly scrub substrate and inspect for defects, imperfections, pin holes, fissures, etc. Scrub defects to prepare for necessary repairs and patching.
 - 2. Perform necessary repairs. Large or unusual damage shall be directed by a written directive from the Architect.
 - 3. Thoroughly scrub substrate and inspect for defects. Install skim-coat and back fill small imperfections, pin holes, air entrapment, etc. Allow skim-coat to fully cure.
 - 4. Thoroughly remove excess skim-coat material using wet-grinding method, no higher than the 200-grit level. Insure substrate receives full refinement by abrasive used before progressing to next finer abrasive grit level.
 - 5. Finish perimeter edges, fixture bases, thresholds and areas adjoining other materials with hand polishers, in a clean and sharp manner.
 - a. Insure complete grit refinement before changing to next finer abrasive disk.
 - b. Detain inside corners, door thresholds, nooks & crannies with attention to detail.
 - 6. Thoroughly scrub substrate and inspect for defects. Allow floor to completely dry.
 - 7. Install dye or stain as specified by possible changes to the scope of this project. Allow floor to dry completely.
 - 8. Remove excess dye residue and thoroughly scrub substrate, inspect for defects. Allow substrate to dry completely.
- D. Apply hardener/densifier as follows.
- 1. It is critical that two coats of hardener/densifier be applied.
 - 2. Strictly adhere to Manufacturer's written instructions for installation.

3. Apply first densifier coat at 250 ft²/gal to full rejection, following the 200-grit level.
 4. Allow densifier to dry 12 hours if possible.
 5. Continue refining dried, densified surface with next successive grit level. Insure substrate receives full refinement by abrasive used before progressing.
 6. Thoroughly wash substrate and allow to dry.
 7. Apply second densifier application at 350 ft²/gal, prior to the final polishing passes.
 8. Follow manufacturer's recommendations for drying time between successive applications.
- E. Install final polish and finishes.
1. Insure substrate receives full refinement by final abrasive polishing passes.
 2. Final polish perimeter edges in a clean and sharp manner.
 3. Thoroughly wash finished flooring with attention to perimeter edging, inside corners and hard to reach areas and allow to dry completely.
 4. Install Stain Guard Sealer per manufacturer's instructions and close off to all traffic regardless, allow to dry completely. Burnish, if necessary, to remove excess or puddling.
 5. Fill moving control and expansion joints after concrete finish has been fully completed.
 - a. Strip and thoroughly clean joint, vacuum and prepare joint for joint sealant.
 - b. Tape adjacent finished flooring, alternate flooring, foundation footers, etc. to avoid sealant contamination on surfaces not receiving sealant.
 - c. Install urethane joint sealant per manufacturer's written instructions.
 - d. Finish and tool joint material if necessary, in a sharp clean manor.
 - e. Carefully remove tape as surface of joint material begins to cure and "skin over".

3.6 ADJUSTMENTS

- A. Re-polish defective areas not meeting expectations per mock-up.
- B. Fill joints flush to surface on checked or cracked out control joints.
- C. Perform repairs to finished polished concrete damaged after installation directed by Architect.

3.7 FINAL CLEANING

- A. Clean site of all unused product, residues, rinse water, wastes, and effluents in accordance with environmental regulations.
- B. Remove and dispose of all materials used to protect surrounding areas and non-masonry surfaces, following completion of the work of this section.

3.8 PROTECTION OF FINISHED FLOOR

- A. Protect finished flooring through project completion.
- B. Implement Recommended Daily Cleaning Procedures supplied by installer through completion.
- C. Continue daily cleaning of newly installed polished concrete at exterior entries, corridors, perimeter wall base, inside corners, door jambs, etc.
- D. Do not permit construction traffic over unprotected floor surfaces.
- E. Protect with EZ Cover™ by McTech Corp., or comparable product where necessary.
 - 1. Contact: Phone: (866) 913-8363; website: www.ezform.net.
 - 2. Do not tape protection directly to finished flooring.

END OF SECTION 03 3500

SECTION 03 3510 – DENSIFIED CONCRETE FINISHING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Chemically reactive, sodium silicate/siliconate, penetrating liquid hardener/densifier applied to new concrete slabs.

1.2 RELATED SECTIONS

A. The following Section(s) contain work related to the work of this Section:

1. Section 033000 – Cast-in-Place Concrete: General requirements for mixing, placing, and finishing cast-in-place concrete floor slabs.

1.3 REFERENCES

A. American Society for Testing and Materials (ASTM):

1. ASTM C 140 – Standard Test Methods for Sampling and Testing Concrete Masonry Units and Related Units
2. ASTM C 642 – Standard Test Method for Density, Absorption, and Voids in Hardened Concrete
3. ASTM C 779 – Standard Test Method for Abrasion Resistance of Horizontal Concrete Surfaces
4. ASTM D 2047 – Standard Test Method for Static Coefficient of Friction of Polish-Coated Flooring Surfaces as Measured by the James Machine
5. ASTM E 96 – Standard Test Methods for Water Vapor Transmission of Materials

1.4 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

B. Review scope of Work expected. Require representatives of each entity directly concerned with concrete slab work to attend, including the following:

1. Contractor's superintendent.
2. Concrete slab subcontractor.
3. Densifier Applicator.

4. Densifier manufacturer's representative.
5. Architect's and/or Owner's representative (at their option).

C. Review the following, at a minimum:

1. Schedule
2. Extent of Work.
3. Curing method and materials.
4. Materials to be applied.
5. Procedures to be used for densifying and protecting the concrete.
6. Material storage and staging.
7. Temporary heating.
8. Water management procedures.
9. Cleanup and disposal of waste materials.

1.5 ACTION SUBMITTALS

- A. General: Submit the following for approval. Do not proceed with work involving any action submittal until approval is obtained.
- B. Product Data: For the following; include material physical characteristics, storage and application instructions, precautions and safety data, cleanup, and maintenance information:
 1. Liquid densifier.

1.6 INFORMATIONAL SUBMITTALS

- A. General: Submit the following to the Owner for the Owner's information and records. If acceptable, and unless otherwise indicated, Informational Submittals will not be acted upon or returned.
- B. Safety Data Sheets SDS for all products used.
- C. Qualification Data: For Installer.

1.7 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company regularly engaged in the manufacturing of the products specified in this section, with at least ten 10 years' successful history manufacturing material specified herein.

- B. Installer Qualifications: Installer who is approved by, or acceptable to manufacturer for application of densifier products required for this Project, with at least five 5 years' experience in application of sodium silicate-based concrete densifiers.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products in original factory packaging, bearing identification of product, manufacturer, batch number, and expiration date.
 - 1. Furnish Safety Data Sheets to the project superintendent for each product.
- B. Store products in a location protected from freezing, damage, construction activity, precipitation and direct sunlight in strict accordance with the manufacturer's recommendations.
- C. Handle all products with appropriate precautions and care as stated on the Safety Data Sheets and manufacturers' recommendations.

1.9 PROJECT CONDITIONS

- A. Environmental Limitations: Comply with manufacturer's written instructions for ambient temperature and humidity, slab substrate temperature and moisture content, wind, precipitation, and other conditions affecting densifier performance.
- B. Use appropriate measures for protection and supplementary heating to ensure proper curing conditions in accordance with manufacturer's recommendations if application during inclement weather occurs.
- C. Do not allow liquid materials to freeze.
- D. Protect adjacent work from contamination due to mixing, handling, and application of liquid densifier and sealer products.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Penetrating Liquid Floor Treatment: Clear – **CN-5**, chemically reactive, waterborne solution of inorganic silicate or silicate materials and proprietary components; odorless; that penetrates, hardens, and densifies concrete surfaces.
 - 1. Basis-of-Design Product: Subject to compliance with requirements, provide Euclid Chemical Company (The); an RPM company; Euco Diamond Hard or a comparable product by one of the following:
 - a. PROSOCO, Inc. – Blended Densifier
 - b. Dayton Superior – Sure Hard Densifier J17

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Inspect surfaces to receive densifier; ensure that substrate is clean, sound, properly of standing water, coatings or curing compounds, foreign particles, oil, dust, grease, or laitance that will adversely affect the performance of densifier materials.
- B. Inspect all areas involved to establish extent of work, access, and need for protection of surrounding construction.
- C. Examine Project conditions, with Installer present, for conditions affecting performance of the Work.
- D. Verify proper placement, finishing, and curing of the concrete floor slab to be densified.
- E. Proceed with concrete slab densifier work only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Protect all surroundings from exposure to densifier and sealer materials including, but not limited to, windows, roofs, walkways, drives, and landscaping.
 - 1. Particularly protect glass, aluminum, and polished metal surfaces. In case of exposure, wash off immediately to avoid etching.
- B. Ensure that new concrete has been cured at least seven days prior to densifier application.
 - 1. If slab has been cured with film-forming curing compounds, completely remove residue, using cleaning materials recommended by curing compound manufacturer and/or by mechanical means, if necessary.
- C. Remove loose material by hand or mechanically, in accordance with standard practice.
- D. Ensure that air, densifier material, and surface temperature are at least 40 degrees F and rising prior to beginning application.
- E. If concrete has been treated with an acid-based stain, follow densifier/sealer manufacturer's recommendation for surface preparation.

3.3 APPLICATION

- A. General: Follow all manufacturer's recommendations and written instructions when applying densifier and sealer materials for a single coat application. Apply second coat if required by product manufacturer to meet performance criteria.
 - 1. Follow manufacturer's safety and personal protective equipment

3.4 CLEANING

- A. Clean overspray, spillage, and accidental exposure of material from adjacent surfaces.
- B. Remove all debris and excess materials from the job site and dispose of in accordance with all applicable regulations for waste disposal.
 - 1. Do not dispose of liquid sealer materials into sanitary sewers or storm drains.

3.5 PROTECTION

- A. Protect densified concrete from spills, stains, and damage during construction, prior to finish and protector application.
- B. Do not clean, scrub, or allow liquids on surface for a minimum of 72 hours following application of finish and protector.
- C. Do not cover surface for a minimum of 7 days following application of finish and protector.
- D. Do not allow standing water on surface for a minimum of 7 days following application of Durable Floor System.

END OF SECTION 033517

SECTION 034500 - PRECAST ARCHITECTURAL CONCRETE

PART 1 GENERAL

1.01 Section Includes

- A. Architectural precast concrete sill.
- B. Supports, anchors, and attachments.
- C. Grouting under panels.

1.02 Related Requirements

- A. Section 079200 - Joint Sealants: Sealing perimeter and intermediate joints.

1.03 Reference Standards

- A. ACI CODE-318 - Building Code for Structural Concrete—Code Requirements and Commentary; 2025.
- 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; 2024.
- E. ASTM A1064/A1064M - Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete; 2024.
- F. ASTM C1602/C1602M - Standard Specification for Mixing Water Used in the Production of Hydraulic Cement Concrete; 2022.
- G. ASTM C33/C33M - Standard Specification for Concrete Aggregates; 2024a.
- H. ASTM C150/C150M - Standard Specification for Portland Cement; 2024.
- I. ASTM C618 - Standard Specification for Coal Ash and Raw or Calcined Natural Pozzolan for Use in Concrete; 2025a.
- J. ASTM C979/C979M - Standard Specification for Pigments for Integrally Colored Concrete; 2024.
- K. ASTM C989/C989M - Standard Specification for Slag Cement for Use in Concrete and Mortars; 2025.
- L. ASTM C1240 - Standard Specification for Silica Fume Used in Cementitious Mixtures; 2020.
- M. PCI MNL-117 - Manual for Quality Control for Plants and Production of Architectural Precast Concrete Products; 2013.
- N. PCI MNL-120 - PCI Design Handbook; 2025.

- O. PCI MNL-122 - Architectural Precast Concrete; 2007.
- P. PCI MNL-123 - Connections Manual: Design and Typical Details of Connections for Precast and Prestressed Concrete; 1988.
- Q. PCI MNL-135 - Tolerance Manual for Precast and Prestressed Concrete Construction; 2000.

1.04 Submittals

- A. See Section 013000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Manufacturer's information on accessory products, including pigments, admixtures, inserts, plates, etc.
- C. Shop Drawings: Indicate layout, unit locations, configuration, unit identification marks, reinforcement, integral insulation, insulated panel system connectors, connection details, support items, location of lifting devices, dimensions, openings, and relationship to adjacent materials. Provide erection drawings.

1.05 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. Design Loads: Static loads, anticipated dynamic loading, including positive and negative wind loads, thermal movement loads, and erection forces as defined by applicable code.
 - 2. Calculate structural properties of units in accordance with ACI CODE-318.
 - 3. Accommodate construction tolerances, deflection of building structural members, and clearances of intended openings.
 - 4. Provide connections that accommodate building movement and thermal movement and adjust to misalignment of structure without unit distortion or damage.
- B. Finish Type A: Ensure exposed-to-view finish surfaces of precast units are uniform in color and appearance.

2.02 Reinforcement

- A. Reinforcing Steel: ASTM A615/A615M, Grade 60 (60,000 psi) (420 MPa).
- B. Steel Welded Wire Reinforcement (WWR): Plain type, ASTM A1064/A1064M.

2.03 Concrete Materials

- A. Cement: ASTM C150/C150M, Type I - Normal Portland type.
- B. Other Cementitious Materials:
 - 1. Fly Ash or Natural Pozzolans: Comply with ASTM C618.
 - 2. Ground Granulated Blast Furnace Slag: ASTM C989/C989M.
 - 3. Silica Fume: Comply with ASTM C1240.
- C. Fine and Coarse Structural Aggregates: ASTM C33/C33M.
- D. 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.
- E. Water: ASTM C1602/C1602M; clean, potable, and not detrimental to concrete.

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.

2.06 Fabrication Tolerances

- A. Comply with PCI MNL-117 and PCI MNL-135, except as specifically amended below.
 - 1. Maximum Variation From Nominal Face Dimensions: Plus or minus 3/32 in (2.4 mm).
 - 2. Maximum Variation From Square or Designated Skew: Plus or minus 1/8 inch in 10 feet (1 mm per m).
 - 3. Maximum Variation from Thickness: Plus or minus 1/8 in (3 mm).

2.07 Source Quality Control

- A. Provide testing and analysis of concrete mix.

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.

3.03 Tolerances

- A. Erect members level and plumb within allowable tolerances. Comply with PCI MNL-135, except as specifically amended below.
 - 1. Plan Location from Building Grid Datum: Plus or minus 3/8 in (9.5 mm).
 - 2. Top Elevation from Nominal Top Elevation: Plus or minus 3/8 inch (9.5 mm).

END OF SECTION

SECTION 042000 - UNIT MASONRY

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Clay facing brick.
- B. Common brick.
- C. Mortar and grout.
- D. Reinforcement and anchorage.
- E. Flashings.
- F. Lintels.
- G. Accessories.

1.02 RELATED REQUIREMENTS

- A. Section 042010 – Structural Reinforced Unit Masonry: Reinforcing steel for grouted masonry.
- B. Section 055000 - Metal Fabrications: Loose steel lintels.
- C. Section 076200 - Sheet Metal Flashing and Trim: Through-wall masonry flashings.
- D. Section 079200 - 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; 2024.
- C. ASTM A641/A641M - Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire; 2019 (Reapproved 2025).
- D. ASTM A951/A951M - Standard Specification for Steel Wire for Masonry Joint Reinforcement; 2022.
- E. ASTM A1064/A1064M - Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete; 2024.
- F. ASTM C90 - Standard Specification for Dry-Cast Loadbearing Concrete Masonry Units; 2024
- G. ASTM C91/C91M - Standard Specification for Masonry Cement; 2025.
- H. ASTM C129 - Standard Specification for Dry-Cast Nonloadbearing Concrete Masonry Units; 2025.
- I. ASTM C140/C140M - Standard Test Methods for Sampling and Testing Concrete Masonry Units and Related Units; 2025.

- J. ASTM C144 - Standard Specification for Aggregate for Masonry Mortar; 2025.
- K. ASTM C150/C150M - Standard Specification for Portland Cement; 2024.
- L. ASTM C207 - Standard Specification for Hydrated Lime for Masonry Purposes; 2024.
- M. ASTM C216 - Standard Specification for Facing Brick (Solid Masonry Units Made from Clay or Shale); 2024.
- N. ASTM C270 - Standard Specification for Mortar for Unit Masonry; 2025a.
- O. ASTM C404 - Standard Specification for Aggregates for Masonry Grout; 2024.
- P. ASTM C476 - Standard Specification for Grout for Masonry; 2023.
- Q. ASTM C780 - Standard Test Methods for Preconstruction and Construction Evaluation of Mortars for Plain and Reinforced Unit Masonry; 2025a.
- R. ASTM C979/C979M - Standard Specification for Pigments for Integrally Colored Concrete; 2024.
- S. ASTM C1714/C1714M - Standard Specification for Preblended Dry Mortar Mix for Unit Masonry; 2019a.
- T. BIA Technical Notes No. 7 - Water Penetration Resistance – Design and Detailing; 2017.
- U. BIA Technical Notes No. 13 - Ceramic Glazed Brick Exterior Walls; 2017.
- V. BIA Technical Notes No. 28B - Brick Veneer/Cold-Formed Steel Framed Walls; 2025.
- W. BIA Technical Notes No. 46 - Maintenance of Brick Masonry; 2017.
- X. TMS 402/602 - Building Code Requirements and Specification for Masonry Structures; 2022, with Errata (2024).
- Y. UL (FRD) - Fire Resistance 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 all relevant installers.

1.05 SUBMITTALS

- A. See Section 013000 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide data for masonry units, fabricated wire reinforcement, mortar, and masonry accessories.
- C. Shop Drawings: Indicate pertinent dimensions, materials, anchorage, size and type of fasteners, and accessories for brickwork support system.
- D. Samples: Submit four samples of decorative block units to illustrate color, texture, and extremes of color range.
- E. Manufacturer's Certificate: Certify that masonry units meet or exceed specified requirements.
- F. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
 - 1. See Section 016000 - Product Requirements, for additional provisions.

1.06 QUALITY ASSURANCE

- A. Comply with provisions of TMS 402/602, except where exceeded by requirements of Contract Documents.
- B. Fire Rated Assemblies: Comply with applicable code for requirements for fire rated masonry construction.
- C. Manufacturer Qualifications: Company specializing in manufacturing the type of products specified in this section with minimum three years of documented experience.
- D. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years of documented experience.

1.07 MOCK-UPS

- A. Construct a masonry wall as a mock-up panel sized 8 feet (2.4 m) long by 6 feet (1.8 m) 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.

1.08 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, handle, and store masonry units by means that will prevent mechanical damage and contamination by other materials.

PART 2 PRODUCTS

2.01 CONCRETE MASONRY UNITS

- A. Concrete Block: See 042010 for Additional Information.

2.02 BRICK UNITS

- A. Manufacturers:
 - 1. Interstate Brick : www.generalshale.com/#sle.
 - 2. Substitutions: See section 016000 - Product Requirements.
- B. Facing Brick: ASTM C216, Type FBX, Grade SW.
 - 1. Color and texture:
 - a. FB-01: Obsidian
 - b. FB-02: Pewter
 - 2. Actual size: 3-1/2 inches (89 mm) or 3-5/8 inches (92 mm) wide by 2-1/4 inches (57 mm) high by 8 inches (203 mm) long.
 - 3. Special shapes: Molded units as required by conditions indicated, unless standard units can be sawn to produce equivalent effect.

- C. Building (Common) Brick: ASTM C62, Grade SW; solid units.

2.03 MORTAR AND GROUT MATERIALS

- A. Hydrated Lime: ASTM C207, Type S.
- B. Mortar Aggregate: ASTM C144.
- C. Grout Aggregate: ASTM C404.
- D. Pigments for Colored Mortar: Pure, concentrated mineral pigments specifically intended for mixing into mortar and complying with ASTM C979/C979M.
 - 1. Color(s): As selected by Architect from manufacturer's full range.
 - 2. Manufacturers:
 - a. Davis Colors, a division of Venator Materials PLC: www.daviscolors.com/#sle.
 - b. Lambert Corporation: www.lambertusa.com/#sle.
 - c. Solomon Colors, Inc: www.solomoncolors.com/#sle.
 - d. Substitutions: See Section 016000 - Product Requirements.
- E. Water: Clean and potable

2.04 REINFORCEMENT AND ANCHORAGE

- A. See 042010 for additional information.

2.05 FLASHINGS

- A. Stainless steel core flexible flashing with drainage fabric - Basis of Design – York Manufacturing Inc. – “York Flash-Vent SS. Other manufacturers may be acceptable provided they meet project requirements.
 - 1. Other manufacturers include:
 - a. STS Coatings, Inc.; Wall Guardian Venting Stainless Steel TWF (www.stscoatings.com)
 - b. Building Materials West Company, Inc.; Evacu-Flash SS (www.evacu-flash.com)
 - 2. Characteristics:
 - a. Type: Engineered system, with high resistant to damage, composite with a stainless steel with non-asphalt adhesive polymer fabric laminated to one stainless steel and non-woven drainage fabric laminated to opposing face with non-asphalt adhesive.
 - b. Stainless steel: type 304, ASTM A240. Domestically sourced per DFARS 252.225-7008 and/or DFARS 252.225-7009.
 - c. Fabrics:
 - 1) Polymer fabric; laminated back face to stainless steel core
 - 2) Non-woven drainage fabric: Fabric laminated to front face stainless steel core.
 - 3) Recycled content: stainless steel is 60% recycled
 - 4) Size: Manufacturer's standard width rolls
- B. Accessories:

1. Mastic/sealant: Product standard of quality is York Manufacturing, Inc.; UniverSeal US100.
 - a. Characteristics:
 - 1) Type: One part 100% solids, solvent-free formulated silyl-terminated polyether (STPE), ASTM C920-11, Type S, Grade NS, Class 50.
2. Outside corner and inside corner material; manufacturer's standard available units using:
 - a. Stainless steel: 26-gauge stainless steel.
3. End dam: Product may be folded in line with the flashing material or utilize preformed end dams by manufacturer using:
 - a. Stainless steel: 26-gauge stainless steel
4. Splice material: Product standard of quality is York 304 by York Manufacturing, standard self-adhered metal material; material matching system material or use York Manufacturing's Multi-Flash Stainless Steel lap piece and polyether sealant as a splice.
5. Termination bar: Product standard of quality is York T-96 termination bar. Manufacturer's standard 1" composite material bar or a 1" 26-gauge stainless steel termination bar with sealant lip.
6. Weep vent protection: Product standard of quality is York's Weep Armor. Geotextile drainage fabric at least 12" in height.
7. Repair and other materials/accessories: Manufacturer's standard.
8. Fasteners: Domestic manufactured fastener types and sizes recommended by flashing manufacturer for intended use.
9. Drip Edge
 - a. Stainless steel: 26-gauge stainless steel
- C. Application: Unless otherwise indicated, use the following:
 1. Where flashing is indicated to receive counterflashing, use metal flashing.
 2. Where flashing is indicated to be turned down at or beyond the wall face, use metal flashing.
 3. Where flashing is partly exposed and is indicated to terminate at the wall face, use stainless steel core flexible flashing with drainage fabric
 4. Where flashing is fully concealed, use flexible stainless-steel core flexible flashing with drainage fabric
- D. SCHEDULES
 1. Locations:
 - a. Exterior door heads.
 - b. Window heads and sills.
 - c. Storefront heads.
 - d. Horizontal control joints.
 - e. Changes in veneer materials, vertically.
 - f. Other wall openings.
 - g. Other locations indicated

2.06 ACCESSORIES

- A. Preformed Control Joints: Rubber material. Provide with corner and tee accessories, fused joints.
 1. Manufacturers:
 - a. Blok-Lok Limited: www.blok-lok.com/#sle.
 - b. Hohmann & Barnard, Inc: www.h-b.com/#sle.

- c. WIRE-BOND: www.wirebond.com/#sle.
 - d. Substitutions: See Section 016000 - Product Requirements.
- B. Joint Filler: Closed cell polyvinyl chloride; oversized 50 percent to joint width; self expanding; in maximum lengths available.
 - 1. Manufacturers:
 - a. Hohmann & Barnard, Inc: www.h-b.com/#sle.
 - b. WIRE-BOND: www.wirebond.com/#sle.
 - c. Substitutions: See Section 016000 - Product Requirements.
- C. 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.
 - a. Manufacturers:
 - 1) 3GEN Masonry Products; Mortar Clear: www.3genmp.com/#sle.
 - 2) Advanced Building Products, Inc; Mortar Break DT: www.advancedbuildingproducts.com/#sle.
 - 3) Advanced Building Products Inc; Mortar Break: www.advancedbuildingproducts.com/#sle.
 - 4) Mortar Net Solutions; MortarNet: www.mortarnet.com/#sle.
 - 5) WIRE-BOND: www.wirebond.com/#sle.
 - 6) York Flashings: www.yorkflashings.com/#sle.
 - 7) Substitutions: See Section 016000 - Product Requirements.
- D. Weeps:
 - 1. Type: Polyester mesh.
 - 2. Color(s): As selected by Architect from manufacturer's full range.
 - 3. Manufacturers:
 - a. Advanced Building Products, Inc: www.advancedbuildingproducts.com/#sle.
 - b. Blok-Lok Limited: www.blok-lok.com/#sle.
 - c. CavClear, a Division of Archovations Inc: www.cavclear.com/#sle.
 - d. Hohmann & Barnard, Inc: www.h-b.com/#sle.
 - e. Masonry Technology, Inc; Cavity Weep: www.mtidry.com/#sle.
 - f. Mortar Net Solutions; WeepVent: www.mortarnet.com/#sle.
 - g. WIRE-BOND: www.wirebond.com/#sle.
 - h. Substitutions: See Section 016000 - Product Requirements.
- E. Cleaning Solution: Proprietary Acidic Cleaner: Manufacturer's standard-strength cleaner designed for removing mortar/grout stains, efflorescence, and other new construction stains from new masonry without discoloring or damaging masonry surfaces. Use product expressly approved for intended use by cleaner manufacturer and manufacturer of masonry units being cleaned.
 - 1. Manufacturers to compliance with requirements, provide products by one of the following:
 - a. Diedrich Technologies, Inc.; a Hohmann & Barnard company.
 - b. EaCo Chem, Inc.

- c. PROSOCO, Inc; Sure Klean® 600.

2.07 MORTAR AND GROUT MIXING

- A. Colored Mortar: Proportion selected pigments and other ingredients to match Architect's sample, without exceeding manufacturer's recommended pigment-to-cement ratio.
- B. Grout: See 042010 for additional information.
- C. Admixtures: Not permitted.
- D. Mixing: Use mechanical batch mixer and comply with referenced standards.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that field conditions are acceptable and are ready to receive masonry.
- B. Verify that related items provided under other sections are properly sized and located.
- C. Verify that built-in items are in proper location, and ready for roughing into masonry work.

3.02 PREPARATION

- A. Direct and coordinate placement of metal anchors supplied for installation under other sections.
- B. 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.
- B. Maintain materials and surrounding air temperature to minimum 40 degrees F (5 degrees C) prior to, during, and 48 hours after completion of masonry work.
- C. Maintain materials and surrounding air temperature to maximum 90 degrees F (32 degrees C) prior to, during, and 48 hours after completion of masonry work.

3.04 COURSING

- A. Establish lines, levels, and coursing indicated. Protect from displacement.
- B. Maintain masonry courses to uniform dimension. Form vertical and horizontal joints of uniform thickness.
- C. Concrete Masonry Units:
 - 1. Bond: Running.

2. Coursing: One unit and one mortar joint to equal 8 inches (200 mm).
 3. Mortar Joints: Concave.
- D. Brick Units:
1. Bond: Running.
 2. Coursing: Three units and three mortar joints to equal 8 inches (200 mm).
 3. Mortar Joints: Concave.

3.05 PLACING AND BONDING

- A. Lay solid masonry units in full bed of mortar, with full head joints, uniformly jointed with other work.
- B. Buttering corners of joints or excessive furrowing of mortar joints is not permitted.
- C. Remove excess mortar and mortar smears as work progresses.
- D. Interlock intersections and external corners, except for units laid in stack bond.
- E. Do not shift or tap masonry units after mortar has achieved initial set. Where adjustment must be made, remove mortar and replace.
- F. Perform job site cutting of masonry units with proper tools to provide straight, clean, unchipped edges. Prevent broken masonry unit corners or edges.
- G. Cut mortar joints flush where wall tile is scheduled or resilient base is scheduled.
- H. Isolate masonry partitions from vertical structural framing members with a control joint as indicated.
- I. Isolate top joint of masonry partitions from horizontal structural framing members and slabs or decks with compressible joint filler.

3.06 WEEPS/CAVITY VENTS

- A. Install weeps in veneer and cavity walls at 24 inches (600 mm) 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 WYTHERY MASONRY, and CAVITY WALL MASONRY

- A. See 042010 for additional information.

3.09 REINFORCEMENT AND ANCHORAGE - MASONRY VENEER

- A. Masonry Back-Up: Embed anchors to bond veneer at maximum 16 inches (400 mm) on center vertically and 36 inches (900 mm) on center horizontally. Place additional anchors at perimeter of openings and ends of panels, so maximum spacing of anchors is 8 inches (200 mm) on center.
- B. Stud Back-Up: Secure veneer anchors to stud framed back-up and embed into masonry veneer at maximum 16 inches (400 mm) on center vertically and 24 inches (600 mm) on center horizontally. Place additional anchors at perimeter of openings and ends of panels, so maximum spacing of anchors is 8 inches (200 mm) on center.

3.10 MASONRY FLASHINGS

- A. Whether or not specifically indicated, install masonry flashing to divert water to exterior at all locations where downward flow of water will be interrupted.
 - 1. Extend flashings full width at such interruptions and at least 6 inches (152 mm), minimum, into adjacent masonry or turn up flashing ends at least 1 inch (25.4 mm), minimum, to form watertight pan at nonmasonry construction.
 - 2. Remove or cover protrusions or sharp edges that could puncture flashings.
 - 3. Seal lapped ends and penetrations of flashing before covering with mortar.
- B. Terminate flashing up 8 inches (203 mm) minimum on vertical surface of backing:
 - 1. Install vertical leg of flashing over fluid-applied or self-adhered air/vapor barriers over backing or per manufacturer's directions.
 - 2. Terminate vertical leg of flashing into bed joint in masonry or reglet in concrete.
 - 3. Anchor vertical leg of flashing into backing with a termination bar and sealant.
 - 4. Apply cap bead of sealant on top edge of self-adhered flashing.
- C. Install flashing in accordance with manufacturer's instructions and BIA Technical Notes No. 7.
- D. Extend metal flashings through exterior face of masonry and terminate in an angled drip with hemmed edge. Install joint sealer below drip edge to prevent moisture migration under flashing.
- E. Lap end joints of flashings at least 6 inches (152 mm), minimum, and seal watertight with flashing sealant/adhesive.

3.11 GROUTED COMPONENTS

- A. See 042010 for additional information.

3.12 CONTROL AND EXPANSION JOINTS

- A. See 042010 for additional information.

3.13 TOLERANCES

- A. Install masonry within the site tolerances found in TMS 402/602.
- B. See 042010 for additional information.

3.14 FIELD QUALITY CONTROL

- A. An independent testing agency will perform field quality control tests, as specified in Section 014000 - Quality Requirements.

3.15 CLEANING

- A. Remove excess mortar and mortar droppings.
- B. Replace defective mortar. Match adjacent work.
- C. 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

SECTION 042010 - STRUCTURAL REINFORCED 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 033000 - Cast-in-Place Concrete: Installation of dovetail slots for masonry anchors.
- B. Section 042000 - Architectural Masonry
- C. Section 055000 - Metal Fabrications: Loose steel lintels.
- D. Section 072100 - Thermal Insulation: Insulation for cavity spaces.
- E. Section 079200 - 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; 2026.
- C. ASTM A641/A641M - Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire; 2019 (Reapproved 2025).
- D. ASTM A951/A951M - Standard Specification for Steel Wire for Masonry Joint Reinforcement; 2022.
- E. ASTM A1064/A1064M - Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete; 2024.
- F. ASTM C90 - Standard Specification for Dry-Cast Loadbearing Concrete Masonry Units; 2024a.
- G. ASTM C140/C140M - Standard Test Methods for Sampling and Testing Concrete Masonry Units and Related Units; 2025.
- H. ASTM C144 - Standard Specification for Aggregate for Masonry Mortar; 2025.
- I. ASTM C150/C150M - Standard Specification for Portland Cement; 2024.
- J. ASTM C207 - Standard Specification for Hydrated Lime for Masonry Purposes; 2024.
- K. ASTM C270 - Standard Specification for Mortar for Unit Masonry; 2025a.
- L. ASTM C404 - Standard Specification for Aggregates for Masonry Grout; 2024.
- M. ASTM C476 - Standard Specification for Grout for Masonry; 2023.
- N. ASTM C1714/C1714M - Standard Specification for Preblended Dry Mortar Mix for Unit Masonry; 2019a.
- O. BIA Technical Notes No. 28B - Brick Veneer/Cold-Formed Steel Framed Walls; 2025.
- P. BIA Technical Notes No. 7 - Water Penetration Resistance – Design and Detailing; 2017.

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

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Preinstallation Meeting: Convene a preinstallation meeting one week before starting work of this section; require attendance by all relevant installers.
1. Required Attendance
 - a. General Contractor
 - b. Section 04 20 00 Contractor and relevant contractors and installers
 - c. Special Inspector
 2. The Architect, Structural Engineer, and Owner will also attend.
 3. Issues and procedures that shall be discussed at the Pre-Installation Meeting:
 - a. Mock-up; review and approval or notation of corrections required.
 - b. Special Inspection Requirements
 - c. Aesthetic considerations
 4. The contractor shall prepare minutes of the meeting and shall furnish a copy to each attendee and others needing the information.

1.05 SUBMITTALS

- A. See Section 013000 - Administrative Requirements for submittal procedures.
- B. Qualification Data: Prior to submission of any other submittals, submit Installer's Qualification Information indicating compliance with the QUALITY ASSURANCE section below.
- C. Product Data: Provide data for masonry units, fabricated wire reinforcement, mortar, and masonry accessories.
- D. Shop Drawings: Comply with the requirements of ACI SP-66 & ACI 315 and shall include 1/4" scale elevations of all masonry walls with all openings, embedments, and reinforcing shown, and as follows:
1. Top and bottom elevations of walls and bearing elevations of all elements supported
 2. Size and location of all openings, pockets, embedments, and anchor bolts
 3. Bar sizes, location and quantities of reinforcing steel
 4. Location and arrangement of supporting and spacing devices.
 5. Bending and cutting schedules.
 6. All control joints, expansion joints and horizontal relief joints.
 7. All other framing and/or special conditions affecting the work.
 8. Mechanical rebar splice locations.
 9. Reproduction of Construction Documents not permitted.
- E. Manufacturer's Certificate: Certify that masonry units meet or exceed specified requirements.
- F. Mix designs for each type of mortar and grout that includes description of type, proportions of ingredients and type of cement.
1. Grout: Submit grout strength test data. Data shall be in conformance with the requirements for concrete mix designs per Division 3 section "Cast-in-place concrete"
 - a. Include test reports, according to ASTM C 1019, for grout mixes required to comply with compressive strength requirement.
 - b. For self consolidating grout, include test reports for slump flow and visual stability index (VSI) as determined by ASTM C1611
 - c. Prism tests: three tests for each type of construction are required according to ASTM C 1314 where insufficient compressive strength testing and/or data is available. Testing results shall be submitted prior to masonry construction on Project.
- G. Statement of Compressive Strength of Masonry: For each combination of masonry unit type and mortar type, provide statement of average net-area compressive strength of masonry units,

mortar type, and resulting net-area compressive strength of masonry determined according to Tables 1 and 2 in TMS 602/ACI 530.1/ASCE 6.

H. Installer's Qualification Statement.

1.06 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 5 years of documented experience with a record of successful in-service performance on projects with similar size and complexity to this Project, with similar masonry materials and environmental conditions.
- C. Source Limitations:
 - 1. For masonry units: Obtain exposed masonry units of a uniform texture and color, or a uniform blend within the ranges accepted for these characteristics, from single source from single manufacturer for each product required

1.07 PRE-INSTALLATION MEETING

- A. A minimum of one week before starting work of this section, the Contractor shall conduct a Pre-Installation Meeting.
 - 1. Required Attendance:
 - a. General Contractor
 - b. Section 04 20 00 contractor(s) & relevant installers
 - c. Special Inspector
 - 2. Issues and procedures that shall be discussed at the Pre-Installation Meeting:
 - a. Special Inspection & Testing requirements
 - b. Aesthetic & structural considerations
 - 3. The contractor shall prepare minutes of the meeting and shall furnish a copy to each attendee and others needing the information

1.08 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, handle, and store masonry units by means that will prevent mechanical damage and contamination by other materials.

PRODUCTS

2.01 CONCRETE MASONRY UNITS

- A. Concrete Block: Comply with referenced standards and as follows:
 - 1. Size: Standard units with nominal face dimensions of 16 by 8 inches (400 by 200 mm) and nominal depths as indicated on drawings for specific locations.
 - 2. Special Shapes: Provide nonstandard blocks configured for corners.
 - a. Reinforced lintels, bond beams and bearing units shall provide for placement of horizontal reinforcement at four inches (4") above the bottom of the units.
 - b. Provide bullnose units for vertical outside corners at all interior walls and openings, or as indicated in Drawings.
 - 1) Field grinding or modifying block on site after installation to form bullnose is not acceptable.
 - 3. Load-Bearing & Non-Load Bearing Units: ASTM C90, lightweight or medium weight.
 - a. Hollow block, as indicated.

- b. Exposed Faces: Manufacturer's standard color and texture unless indicated otherwise.
- c. Decorative CMUs:
 - 1) CMU-01: Basalite 720 WR Concrete Masonry Unit
 - 2) CMU-02: Basalite Ground face 720WR Concrete Masonry Unit

2.02 BRICK UNITS

- A. See Section 04 20 00

2.03 MORTAR AND GROUT MATERIALS

- A. Blended Hydraulic Cement: ASTM C 595, Type IL, Portland-limestone cement
- B. Hydrated Lime: ASTM C207, Type S.
- C. Portland Cement-Lime Mix: Packaged blend of portland cement and hydrated lime containing no other ingredients
- D. Mortar Aggregate: ASTM C144.
- E. Grout Aggregate: ASTM C404.
- F. Water: Clean and potable.
- G. Integral Water Repellent Admixture for Mortar: Polymeric liquid admixture added to mortar at the time of manufacture.
 - 1. Use only in combination with masonry units manufactured with integral water repellent admixture.
 - 2. Use only water repellent admixture for mortar from the same manufacturer as water repellent admixture in masonry units.
 - 3. Meet or exceed performance specified for water repellent admixture used in masonry units.
 - 4. Use at locations exposed to moisture/exterior elements.
- H. Additives: None permitted, except as specified herein. Specifically do not lower freezing point of mortar or grout by use of calcium chloride or other antifreeze agents
- I. 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 N.
 - 2. Color: Standard gray.
- J. 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.

2.04 REINFORCEMENT AND ANCHORAGE

- A. Reinforcing Steel: ASTM A615/A615M, Grade 60 (60,000 psi) (420 MPa), deformed billet bars; uncoated.
- B. Single Wythe Joint Reinforcement: ASTM A951/A951M.
 - 1. Type: Truss or ladder.
 - 2. Material: ASTM A1064/A1064M steel wire, mill galvanized to ASTM A641/A641M Class 3.
 - 3. Size: 0.1483 inch (3.8 mm) side rods with 0.1483 inch (3.8 mm) cross rods; width as required to provide not less than 5/8 inch (16 mm) of mortar coverage on each exposure.
 - 4. Provide in lengths of not less than 10 feet, with prefabricated corner and tee units.
- C. Multiple Wythe Joint Reinforcement: ASTM A951/A951M.

1. Type: Truss or ladder.
 2. Material: ASTM A1064/A1064M steel wire, mill galvanized to ASTM A641/A641M Class 3.
 3. Size: 0.1483 inch (3.8 mm) side rods with 0.1483 inch (3.8 mm) cross rods; width as required to provide not less than 5/8 inch (16 mm) of mortar coverage on each exposure.
- D. Strap Anchors: Bent steel shapes, 1-1/2 inch (38 mm) width, 0.105 inch (2.7 mm) thick, 24 inch (610 mm) length, with 1-1/2 inch (38 mm) long, 90 degree bend at each end to form a U or Z shape or with cross pins, hot dip galvanized to ASTM A153/A153M Class B.
- E. Flexible Anchors: 2-piece anchors that permit differential movement between masonry and building frame, sized to provide not less than 1/2 inch (16 mm) of mortar coverage from masonry face.
- F. Vertical Reinforcing Positioners: 9 gage, galvanized, O-ring positioners for securing reinforcing steel in place prior to grouting. Space at 48 inches on center maximum.
- G. Anchor Bolts: Headed steel bolts complying with ASTM F1554 grade 36, or ASTM A307, Grade A; with ASTM A 563 (ASTM A 563M) hex nuts and, where indicated, flat washers; hot-dip galvanized to comply with ASTM A 153/A 153M, Class C; of dimensions indicated.

2.05 ACCESSORIES

- A. Preformed Control Joints: Rubber material. Provide with corner and tee accessories, fused joints.
- B. 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.
 - a. Manufacturers:
 - 1) Advanced Building Products Inc; Mortar Break
: www.advancedbuildingproducts.com/#sle.
 - 2) Mortar Net Solutions; MortarNet: www.mortarnet.com/#sle.
 - 3) Substitutions: See Section 016000 - Product Requirements.
- C. Cleaning Solution: Non-acidic, not harmful to masonry work or adjacent materials.

2.06 LINTELS

- A. Masonry lintels: Built-in place masonry lintels made from bond beam concrete masonry units with reinforcing bars placed as indicated and filled with coarse grout. Temporarily support built-in lintels until cured.

2.07 MORTAR AND GROUT MIXING

- A. Mortar for Reinforced Unit Masonry: ASTM C270, using the Proportion Specification.
1. Masonry below grade and in contact with earth: Type S.
 2. Reinforced masonry: Type S.
 3. Interior, non-loadbearing masonry: Type O.
 4. Mix cementitious materials and aggregates between 3 and 5 minutes in a mechanical batch mixer with a sufficient amount of water to produce a workable consistency. Do not hand mix mortar. Maintain workability of mortar by remixing or retempering. Discard mortar which has begun to stiffen or is not used within 2-1/2 hours after initial mixing.
- B. Grout: ASTM C476; consistency required to fill completely volumes indicated for grouting; fine grout for spaces with smallest horizontal dimension of 2 inches (50 mm) or less; coarse grout for spaces with smallest horizontal dimension greater than 2 inches (50 mm).
1. Grout shall attain a minimum compressive strength of 2000 psi at 28 days when tested in accordance with C1019.

2. Provide grout with a slump of 8 to 11 inches (203 to 279 mm) for grout heights less than 5 feet 4 inches, or 10 to 11 inches (254 to 279 mm) for grout lift heights greater than 5 feet 4 inches as measured according to ASTM C 143/C 143M, unless self-consolidating grout is used.
3. Self consolidating grout (if used) shall comply with the material requirements of ASTM C476; have a slump flow of 24 to 30 in as determined by ASTM C1611/C1611M; and has a Visual Stability Index (VSI) less than or equal to 1 as determined in accordance with ASTM C1611/C1611M, Appendix X.1.
 - a. Proportioning of self-consolidating grout at the project site is not permitted. Do not add water at the project site except in accordance with the self-consolidating grout manufacturer's recommendations.
- C. Admixtures: Not permitted, especially antifreeze agents in mortar or grout.
 1. Field addition of admixtures not permitted in self-consolidated grout.
- D. Mixing: Use mechanical batch mixer and comply with referenced standards.

EXECUTION

3.01 EXAMINATION

- A. Verify that field conditions are acceptable and are ready to receive masonry.
- B. Verify that related items provided under other sections are properly sized and located.
- C. Verify that built-in items are in proper location, and ready for roughing into masonry work.

3.02 PREPARATION

- A. Direct and coordinate placement of metal anchors supplied for installation under other sections.
- B. Provide temporary bracing during installation of masonry work. Maintain in place until building structure provides permanent bracing.

3.03 COLD AND HOT WEATHER REQUIREMENTS

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

3.04 COURSING

- A. Establish lines, levels, and coursing indicated. Protect from displacement.
- B. Maintain masonry courses to uniform dimension. Form vertical and horizontal joints of uniform thickness.
- C. Concrete Masonry Units:
 1. Bond: Running.
 2. Coursing: One unit and one mortar joint to equal 8 inches (200 mm).
 3. Mortar Joints: Concave.
 - a. Flush at walls receiving fluid applied finishes or flooring, or another similar finish material that requires a flush surface
 - b. Concave at exposed standard smooth concrete masonry units.

3.05 PLACING AND BONDING

- A. Lay masonry to line on the side that will have the most visible surface. Verify preferred side with Architect prior to installation.

- B. Lay solid masonry units in full bed of mortar, with full head joints, uniformly jointed with other work.
- C. Lay hollow masonry units in contact with foundation with face shell and cross web bedding.
- D. Lay hollow masonry units with face shell bedding on head and bed joints.
- E. Buttering corners of joints or excessive furrowing of mortar joints is not permitted.
- F. Remove excess mortar and mortar smears as work progresses.
- G. Remove excess mortar with water repellent admixture promptly. Do not use acids, sandblasting or high pressure cleaning methods.
- H. Where built-in items are to be embedded in cores of hollow masonry units, place a layer of metal lath, wire mesh, or plastic mesh in the joint below and rod mortar or grout into core.
- I. Fill cores in hollow CMUs with grout 24 inches (600 mm) under bearing plates, beams, lintels, posts, and similar items unless otherwise indicated.
- J. Interlock intersections and external corners, except for units laid in stack bond.
- K. Do not shift or tap masonry units after mortar has achieved initial set. Where adjustment must be made, remove mortar and replace.
- L. Perform job site cutting of masonry units with proper tools to provide straight, clean, unchipped edges. Prevent broken masonry unit corners or edges.
- M. Perform job site scoring of units where non-scored units must be laid in a wall of scored units to conform to layout and bond. Wipe job site scores with mortar to color, if required by the Architect.
- N. Isolate masonry partitions from vertical structural framing members with a control joint as indicated on Drawings.
- O. Isolate top joint of masonry partitions from horizontal structural framing members and slabs or decks as indicated by Architect.
- P. Do not place conduit runs in bond beams or lintels.
- Q. Do not place conduit in jambs indicated in Drawings.

3.06 CAVITY MORTAR CONTROL

- A. Do not permit mortar to drop or accumulate into cavity air space, cores to be grouted, 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.

3.07 REINFORCEMENT AND ANCHORAGE - GENERAL, SINGLE WYTHE MASONRY, AND CAVITY WALL MASONRY

- A. Masonry Joint Reinforcement:
 - 1. Unless otherwise indicated on drawings or specified under specific wall type, install horizontal joint reinforcement 16 inches (400 mm) on center.
 - 2. Place masonry joint reinforcement in first and second horizontal joints above and below openings. Extend minimum 16 inches (400 mm) each side of opening.
 - 3. Place continuous joint reinforcement in first and second joint below top of walls.
 - 4. Embed longitudinal wires of joint reinforcement in mortar joint with at least 5/8 inch (16 mm) mortar cover on each side.
 - 5. Lap joint reinforcement ends minimum 8 inches (200 mm).
 - a. At wall intersections, use prefabricated T-shaped units
 - b. At wall corners, use prefabricated L-shaped units

6. Reinforce stack bonded unit joint corners and intersections with strap anchors 16 inches (400 mm) on center.
 7. Fasten anchors to structural framing and embed in masonry joints as masonry is laid. Unless otherwise indicated on drawings or closer spacing is indicated under specific wall type, space anchors at maximum of 36 inches (900 mm) horizontally and 24 inches (600 mm) vertically.
- B. Wall Reinforcement:
1. Comply with requirements in TMS 602/ACI 530.1/ASCE 6, latest edition.
 - a. Support reinforcement to prevent displacement caused by construction loads or by placement of grout or mortar, beyond the allowable tolerances.
 - b. Completely embed reinforcing bars in grout.
 - c. Maintain clear distance between reinforcing bars and the interior of masonry unit or formed surface of at least 1/4 inch (6.4 mm) for fine grout and 1/2 inch (12.7 mm) for coarse grout, except where cross webs of hollow units are used as supports for horizontal reinforcement.
 - d. Place reinforcing bars maintaining the following minimum cover:
 - 1) Masonry face exposed to earth or weather: 2 inches (50.8 mm) for bars larger than No. 5 (M #16); 1½ inches (38.1 mm) for No. 5 (M #16) bars or smaller.
 - 2) Masonry not exposed to earth or weather: 1½ inches (38.1 mm).
 - e. Maintain minimum clear distance between parallel bars of the nominal bar size or 1 inch (25.4 mm), whichever is greater.
 - f. In columns and pilasters, maintain minimum clear distance between vertical bars of one and one-half times the nominal bar size or 1½ inches (38.1 mm), whichever is greater.
 - g. Splice only where indicated on the Project Drawings, unless otherwise acceptable.
 - h. Unless accepted by the Architect/Engineer, do not bend reinforcement after it is embedded in grout or mortar.
 - i. Noncontact lap splices: Position bars spliced by noncontact lap splice no farther apart transversely than one-fifth the specified length of lap nor more than 8 inches (203 mm)
- C. Tolerances
1. Place & support reinforcing bars in walls and flexural elements from displacement. Maintain position within 1/2 inch (13 mm) of dimensioned position.
 - a. Place vertical bars within:
 - 1) 2 inches (50.8 mm) of the required location along the length of the wall when the wall segment length exceeds 24 inches (610 mm).
 - 2) 1 inch (25.4 mm) of the required location along the length of the wall when the wall segment length does not exceed 24 inches (610 mm)
 2. If it is necessary to move bars more than one bar diameter or a distance exceeding the tolerance stated above to avoid interference with other reinforcing steel, conduits, or embedded items, notify the Architect/Engineer for acceptance of the resulting arrangement of bars.
 - a. Foundation dowels that interfere with unit webs are permitted to be bent to a maximum of 1 inch (25.4 mm) horizontally for every 6 inches (152 mm) of vertical height.

3.08 LINTELS

- A. Install loose steel lintels over openings, unless indicated otherwise on Drawings.
- B. Install reinforced unit masonry lintels over openings where steel are not shown in Drawing.
 1. Do not splice reinforcing bars.
 2. Support and secure reinforcing bars from displacement. Maintain position within 1/2 inch (13 mm) of dimensioned position.

3. Place and consolidate grout fill without displacing reinforcing.
 4. Allow masonry lintels to attain specified strength before removing temporary supports.
 5. Do not place conduits or similar in lintels.
- C. Maintain minimum 16 inch (400 mm) bearing on each side of opening, unless shown otherwise.

3.09 REINFORCED UNIT MASONRY INSTALLATION

- A. Temporary Formwork and Shores: Construct formwork and shores as needed to support reinforced masonry elements during construction.
1. Construct formwork to provide shape, line, and dimensions of completed masonry as indicated. Make forms sufficiently tight to prevent leakage of mortar and grout. Brace, tie, and support forms to maintain position and shape during construction and curing of reinforced masonry.
 2. Do not remove forms and shores until reinforced masonry members have hardened sufficiently to carry their own weight and other loads that may be placed on them during construction.
 3. The masonry fire walls are designed for final condition loading; brace wall as required for temporary external and construction loadings.

3.10 GROUTED COMPONENTS & PLACEMENT

- A. Reinforce bond beams as indicated in Drawings.
- B. Lap splices are as indicated in Drawings.
- C. Place and consolidate grout fill without displacing reinforcing.
- D. Grout shall not be placed until masonry has cured for a minimum of 8 hours.
- E. Provide hardware cloth below "knock-out" type bond beam units, embedded items, and other locations as required to contain grout.
- F. Placement
1. Placing time: Place grout within 1-1/2 hours from introducing water in the mixture and prior to initial set.
 - a. Discard site-mixed grout that does not meet the specified slump without adding water after initial mixing.
 - b. For ready-mixed grout:
 - 1) Addition of water is permitted at the time of discharge to adjust slump.
 - 2) Discard ready-mixed grout that does not meet the specified slump without adding water, other than the water that was added at the time of discharge. The time limitation is waived as long as the ready-mixed grout meets the specified slump.
 2. Confinement: Confine grout to the areas indicated on the Project Drawings. Use material to confine grout that permits bond between masonry units and mortar.
 3. Grout pour height:
 - a. Definition: The total height of masonry to be grouted prior to erection of additional masonry. A grout pour consists of one or more grout lifts.
 - b. Do not exceed the maximum grout pour height given in TMS 602/ACI 530.1/ASCE 6, Table 7.
 4. Grout lift height:
 - a. Definition: An increment of grout height within a total grout pour. A grout pour consists of one or more grout lifts.
 - b. For grout except self-consolidating grout:
 - 1) Where the following conditions are met, place grout in lifts not exceeding 12 feet 8 inches (3.86 m).
 - (a) The masonry has cured for at least 4 hours.

- (b) The grout slump is maintained between 10 and 11 inches (254 and 279 mm).
 - (c) No intermediate reinforced bond beams are placed between the top and the bottom of the pour height.
- 2) When there are intermediate bond beams within the grout pour, limit the grout lift height to the bottom of the lowest bond beam that is more than 5 feet 4 inches (1.63 m) above the bottom of the lift, but do not exceed a grout lift height of 12 feet 8 inches (3.86 m).
- 3) When the conditions above are not met, place grout in lifts not exceeding 5 feet 4 inches (1.63 m).
- 5. For self-consolidating grout:
 - a. Consolidate grout at the time of placement
 - 1) Consolidate grout pours 12 inches (305 mm) or less in height by mechanical vibration or by puddling.
 - 2) Consolidate pours exceeding 12 inches (305 mm) in height by mechanical vibration and reconsolidate by mechanical vibration after initial water loss and settlement has occurred.
 - 3) Consolidation or reconsolidation is not required for self-consolidating grout.
- 6. Grout key: When grouting, form grout keys between grout pours. Form grout keys between grout lifts when the first lift is permitted to set prior to placement of the subsequent lift.
 - a. Form a grout key by terminating the grout a minimum of 1½ inches (38.1 mm) below a mortar joint.
 - b. Do not form grout keys within beams.
 - c. At beams or lintels laid with closed bottom units, terminate the grout pour at the bottom of the beam or lintel without forming a grout key.
- 7. At the top of wall, grout shall be flush with the top of the masonry units

3.11 CONTROL AND EXPANSION JOINTS

- A. Do not continue horizontal joint reinforcement through control or expansion joints.
- B. Install preformed control joint device in continuous lengths. Seal butt and corner joints in accordance with manufacturer's instructions.
- C. Form control and expansion joints as detailed and at locations shown on drawings.

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. At mechanical, plumbing and electrical work that must extend through masonry construction or have the masonry cut to allow access (e.g. plumbing pipes and wall cleanouts) cut, drill or core masonry as required to fit masonry within 1/2 inch of mechanical, plumbing and electrical work, unless a greater distance is required for movement or other documented reason.
- C. Install built-in items plumb, level, and true to line.
- D. Bed anchors of metal door and glazed frames in adjacent mortar joints. Fill frame voids solid with grout.
 - 1. Fill adjacent masonry cores with grout minimum 12 inches (300 mm) from framed openings.
- E. Do not build organic materials subject to deterioration into masonry.

3.13 TOLERANCES

- A. Install masonry within the site tolerances found in TMS 402/602.
- B. Maximum Variation From Unit to Adjacent Unit: 1/16 inch (1.6 mm).
- C. Maximum Variation from Plane of Wall: 1/4 inch in 10 ft (6 mm/3 m) and 1/2 inch in 20 ft (13 mm/6 m) or more.
- D. Maximum Variation from Plumb: 1/4 inch (6 mm) per story non-cumulative; 1/2 inch (13 mm) in two stories or more.
- E. Maximum Variation from Level Coursing: 1/8 inch in 3 ft (3 mm/m) and 1/4 inch in 10 ft (6 mm/3 m); 1/2 inch in 30 ft (13 mm/9 m).
- F. Maximum Variation of Mortar Joint Thickness: Head joint, minus 1/4 inch, plus 3/8 inch (minus 6.4 mm, plus 9.5 mm).
- G. Maximum Variation from Cross Sectional Thickness of Walls: 1/4 inch (6 mm).

3.14 CUTTING AND FITTING

- A. Obtain approval prior to cutting or fitting masonry work not indicated or where appearance or strength of masonry work may be impaired.

3.15 FIELD QUALITY CONTROL

- A. An independent testing agency will perform field quality control tests, as specified in Section 014000 - Quality Requirements & 014533 - Code-Required Special Inspections and Procedures

3.16 CLEANING

- A. Remove excess mortar and mortar droppings.
- B. Replace defective mortar. Match adjacent work.
- C. Clean soiled surfaces with cleaning solution.

3.17 PROTECTION

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

END OF SECTION 042010

SECTION 051200 - STRUCTURAL STEEL FRAMING

GENERAL

1.01 SECTION INCLUDES

- A. Structural steel framing members and support .
- B. Base plates, shear stud connectors and expansion joint plates.
- C. Grouting under base plates.

1.02 RELATED REQUIREMENTS

- A. Section 052100 - Steel Joist Framing.
- B. Section 053100 - Steel Decking: Support framing for small openings in deck.
- C. Section 055000 - Metal Fabrications: Steel fabrications affecting structural steel work.

1.03 REFERENCE STANDARDS

- A. AISC (MAN) - Steel Construction Manual; 2023, with Errata (2025).
- B. AISC 303 - Code of Standard Practice for Steel Buildings and Bridges; 2022, with Errata (2025).
- C. AISC 325 - Steel Construction Manual; 2023.
- D. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2019.
- E. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless; 2024.
- F. ASTM A108 - Standard Specification for Steel Bar, Carbon and Alloy, Cold-Finished; 2024.
- G. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2024.
- H. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2023.
- I. ASTM A307 - Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength; 2021.
- J. ASTM A449 - Standard Specification for Hex Cap Screws, Bolts and Studs, Steel, Heat Treated, 120/105/90 ksi Minimum Tensile Strength, General Use; 2014 (Reapproved 2020).
- K. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes; 2023.
- L. ASTM A514/A514M - Standard Specification for High-Yield-Strength, Quenched and Tempered Alloy Steel Plate, Suitable for Welding; 2022.
- M. ASTM A563/A563M - Standard Specification for Carbon and Alloy Steel Nuts (Inch and Metric); 2021a.
- N. ASTM A572/A572M - Standard Specification for High-Strength Low-Alloy Columbium-Vanadium Structural Steel; 2025.
- O. ASTM A992/A992M - Standard Specification for Structural Steel Shapes; 2022.
- P. ASTM C518 - Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus; 2021.
- Q. ASTM C1107/C1107M - Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink); 2020.

- R. ASTM D638 - Standard Test Method for Tensile Properties of Plastics; 2022.
- S. ASTM D695 - Standard Test Method for Compressive Properties of Rigid Plastics; 2023.
- T. ASTM E94/E94M - Standard Guide for Radiographic Examination Using Industrial Radiographic Film; 2017.
- U. ASTM E709 - Standard Guide for Magnetic Particle Testing; 2021.
- V. ASTM F436/F436M - Standard Specification for Hardened Steel Washers Inch and Metric Dimensions; 2024.
- W. ASTM F1554 - Standard Specification for Anchor Bolts, Steel, 36, 55, and 105-ksi Yield Strength; 2020.
- X. ASTM F3125/F3125M - Standard Specification for High Strength Structural Bolts and Assemblies, Steel and Alloy Steel, Heat Treated, Inch Dimensions 120 ksi, 144 ksi, and 150 ksi Minimum Tensile Strength, and Metric Dimensions 830 MPa and 1040 MPa Minimum Tensile Strength; 2025.
- Y. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination; 2020.
- Z. AWS B2.1/B2.1M - Specification for Welding Procedure and Performance Qualification; 2021, with Errata (2023).
- AA. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2025, with Amendment (2026).
- BB. SSPC-Paint 20 - Zinc-Rich Coating (Type I - Inorganic, and Type II - Organic); 2019.
- CC. SSPC-SP 1 - Solvent Cleaning; 2015, with Editorial Revision (2016).
- DD. SSPC-SP 2 - Hand Tool Cleaning; 2024.
- EE. SSPC-SP 3 - Power Tool Cleaning; 2024.
- FF. SSPC-SP 13/NACE No.6 - Surface Preparation of Concrete; 2018.

1.04 SUBMITTALS

- A. See Section 013000 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings:
 - 1. Indicate profiles, sizes, spacing, locations of structural members, openings, attachments, and fasteners.
 - 2. Connections.
 - 3. Indicate cambers.
 - 4. Indicate welded connections with AWS A2.4 welding symbols. Indicate net weld lengths.
 - 5. Indicate type, size, and length of bolts, distinguishing between shop and field bolts. Identify pretensioned and slip-critical high-strength bolted connections
 - 6. Drawings shall be produced with computer generated software and include erection and piece marks and drawings.
 - 7. Drawings submitted in multiple packages shall contain individual submittals complete with all applicable erection drawings, details, and piece drawings.
 - 8. Reproduction of Contract Documents is not permitted.
 - 9. Provide schedule for submittal of shop and erection drawings.
- 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. Detailer's Qualification Statement: Provide experience record showing steel detailer complies with the QUALITY ASSURANCE section below.
- E. Fabricator's Qualification Statement: Provide experience record showing steel fabricator complies with the QUALITY ASSURANCE section below.
- F. Erector's Qualification Statement: Provide experience record showing steel erector complies with the QUALITY ASSURANCE section below.

- G. Paint Compatibility Certificates: From manufacturers of topcoats applied over shop primers, certifying that shop primers are compatible with topcoats.

1.05 QUALITY ASSURANCE

- A. Fabricate structural steel members in accordance with AISC (MAN) "Steel Construction Manual."
 - 1. Amend AISC 303 as follows:
 - a. Section 3.2: Replace entire section with the following: "Requirements for structural steel including quantities, sizes, locations, arrangement, and details shall be shown or noted in the overall Contract Drawing package. Fabricator is responsible for incorporating all such information from structural, architectural, mechanical, and electrical drawings, as well as those of other disciplines."
 - b. Section 3.5: Remove all text after first sentence.
 - c. Section 3.6: Replace entire section with the following: "When the fast-track project delivery system is selected, release of structural drawings shall constitute release for construction only if specifically noted as such on the drawing. Drawing indicated "preliminary" or "not for construction" shall not be used for detailing or construction except where the risk of any cost or delay associated with subsequent revisions to Contract Documents is accepted by the Owner, Contractor or Fabricator."
 - d. Section 4.4: Revise second sentence to read the following: "The shop and erection drawings shall be returned in accordance with the schedule defined in Division 1 of the project Specification. In the absence of such schedule, the Owner's Designated Representative for Design shall return submittals within 14 calendar days of receipt from the Owner's Designated Representative for Construction."
- B. Detailer: Company specializing in performing the work of this section with minimum 5 years of documented experience with a record of successful in-service performance on projects with similar material, design and scope to this Project.
 - 1. Each project shall be dated and provide the tonnage of steel, number of floors, and name of General Contractor with contact information.
- C. Fabricator: A qualified steel fabricator that participates in AISC Quality Certification Program and is designated an AISC-Certified Plant, Category STD
- D. Welder Qualifications: Welding processes and welding operators qualified in accordance with AWS D1.1/D1.1M and no more than 12 months before start of scheduled welding work.
- E. Erector: Company specializing in performing the work of this section with minimum 5 years of documented experience with a record of successful in-service performance on projects with similar material, design and scope to this Project.
 - 1. Each project shall be dated and provide the tonnage of steel, number of floors, and name of General Contractor with contact information
- F. Field Painting Applicators: Qualified according to SSPC-QP1, "Standard Procedure for Evaluating Qualifications of Painting Contractors "Field Application to Complex Structures".

1.06 PRE-INSTALLATION MEETING

- A. A minimum of one week before starting work of this section, the Contractor shall conduct a Pre-Installation Meeting.
 - 1. Required Attendance
 - a. General Contractor
 - b. Section 05 00 00 contractor(s) & relevant installers
 - c. Special Inspector
 - 2. The Architect, Structural Engineer, and Owner will also attend.
 - 3. Issues and procedures that shall be discussed at the Pre-Installation Meeting:
 - a. Critical structural items

- b. Special inspection requirements
 - c. Aesthetic considerations
- 4. The contractor shall prepare minutes of the meeting and shall furnish a copy to each attendee and others needing the information

PRODUCTS

2.01 MATERIALS

- A. Steel Angles and Channels: As Indicated on Drawings
- B. Steel W Shapes and Tees: As Indicated on Drawings
- C. Rolled Steel Structural Shapes: As Indicated on Drawings
- D. Steel Plates and Bars: As Indicated on Drawings
- E. Cold-Formed Structural Tubing: As Indicated on Drawings
- F. Pipe: As Indicated on Drawings
- G. Steel Headed Stud Anchors: Made from ASTM A108 Grade 1015 bars. through 1020; AWS D1.1/D1.1M, Type B
- H. Structural Bolts, Nuts, and Washers:
 - 1. Use Tension-Control, High-Strength Bolt-Nut-Washer Assemblies whenever possible unless indicated otherwise.
 - 2. High-Strength Bolts, Nuts and Washers
 - a. Heavy-hex steel bolts: ASTM F3125/F3125M, Group 120, Type 1, A325 or F1852.
 - b. Heavy-hex steel nuts: ASTM A563/A563M, Type 1, Grade C, hardened carbon-steel
 - c. Washers: ASTM F436/F436M, Type 1, hardened carbon-steel
 - d. Finish: Plain
 - 3. Tension Control Bolts, High-Strength Bolt-Nut-Washer Assemblies, Twist-off type: ASTM F 1852, Type 1
 - a. Round head assemblies, consisting of :
 - 1) steel structural bolts with splined ends
 - 2) heavy-hex carbon-steel nuts, and
 - 3) hardened carbon-steel washers
 - 4) Finish: plain
- I. Unheaded Anchor Rods: ASTM F1554, Grade 55, plain, weldable, matching
 - 1. Nuts: heavy-hex carbon steel nuts ASTM A563/A563M heavy-hex carbon steel nuts ASTM F436/F436M Type 1 washers.
 - 2. Plate Washers: ASTM A 36/A 36M carbon steel.
 - 3. Washers: ASTM F436/F436M Type 1, hardened carbon steel.
 - 4. Finish: Plain
 - 5. Configuration: Straight
- J. Headed Anchor Rods: ASTM F1554 Grade 55, plain. unless indicated otherwise on Drawings.
 - 1. Nuts: heavy-hex carbon steel nuts ASTM A563/A563M heavy-hex carbon steel nuts ASTM F436/F436M Type 1 washers.
 - 2. Plate Washers: ASTM A 36/A 36M carbon steel.
 - 3. Washers: ASTM F436/F436M Type 1, hardened carbon steel.
 - 4. Finish: Plain
- K. Threaded Rods: ASTM A36/A36M.
 - 1. Nuts: heavy-hex carbon steel nuts ASTM A563/A563M heavy-hex carbon steel nuts ASTM F436/F436M Type 1 washers.
 - 2. Plate Washers: ASTM A 36/A 36M carbon steel.
 - 3. Washers: ASTM F436/F436M Type 1, hardened carbon steel.

4. Finish: Plain
- L. Deformed Anchor Studs (DAS) / Deformed Bar Anchors (DBA): Made from ASTM A 108 low carbon steel, cold worked and deformed per ASTM A 1064. Minimum yield stress = 60 ksi (415 MPa); minimum tensile strength = 80 ksi (550 MPa).
 - M. Rebar: Rebar used for welding shall meet the requirements of ASTM A-706. Minimum bend diameters per ACI 318.
 - N. Welding Materials: AWS D1.1/D1.1M; type required for materials being welded.
 - O. Expansion Anchors, Screw Anchors, and Adhesive Anchors: Size and Manufacturer as indicated on Drawings. Complete assemblies with required rods, nuts, washers, and adhesive system as applicable. Installed in accordance with Manufacturer's installation instructions. Current ICC approval and published ICC Research Report required.
 - 1. Finish for use in conditioned environments free from potential moisture (interior): Plain or in accordance with Manufacturer's standard.
 - P. Grout: ASTM C1107/C1107M; Non-shrink; premixed compound consisting of non-metallic aggregate, cement, water reducing and plasticizing agents.
 - 1. Minimum Compressive Strength at 48 Hours: 2,000 pounds per square inch (13.7 MPa).
 - 2. Minimum Compressive Strength at 28 Days: 6000 pounds per square inch (41 MPa).
 - Q. Shop and Touch-Up Primer: Fabricator's standard rust-inhibiting primer complying with VOC limitations of authorities having jurisdiction and compatible with top-coat.
 - R. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20 Type I - Inorganic, MPI#18 or MPI#19 complying with VOC limitations of authorities having jurisdiction.
 - S. Reinforced Thermoset Resin Structural Thermal Break Pads: High-strength structural framing accessory boards with the following characteristics.
 - 1. Structural Performance: Provide pads capable of withstanding or transferring structural loads.
 - a. Load Types: Shear, moment, and wind loads as indicated on Drawings.
 - 2. Pad Design: Allow for fabrication and construction tolerances, accommodating live load deflection, shrinkage, and creep of the building structure and other building movements; maintain structural steel deflections as required by applicable codes.
 - 3. Board Size: 48 by 96 inches (1219 by 2438 mm).
 - 4. Pad Thickness: 1 inch (25.4 mm) or as indicated on Drawings
 - 5. Apparent Thermal Conductivity: K (Ksi)-value of 1.71 BTU/in/hr/sq ft /°F when tested in accordance with ASTM C518.
 - 6. Compressive Strength: 30,000 PSI minimum, when tested in accordance with ASTM D638.
 - 7. Compressive Modulus: 400,670 psi (2762.5 MPa), minimum, when tested in accordance with ASTM D695.
 - 8. Minimum structural strengths:
 - a. Shear Strength: 14,000 psi
 - b. Tensile Strength: 11,000 psi
 - c. Flexural Strength: 23,000 psi
 - 9. Accessories: Manufacturer's standard bushings and washers, minimum 1/4 inch (6.35 mm) thick, designed to provide thermal break between structural steel washer/bolt and internal element.
 - 10. Manufacturers:
 - a. Thermal Bridging Solutions; Thermal Break Material (TBM-1): www.thermalbridgingsolutions.com/#sle.
 - b. Substitutions: See Section 016000 - Product Requirements.

2.02 FABRICATION

- A. Shop fabricate to greatest extent possible.

- B. Fabricate according to AISC's "Code of Standard Practice for Steel Buildings and Bridges" and AISC 360.
- C. Continuously seal joined members by continuous welds. Grind exposed welds smooth.
- D. Fabricate connections for bolt, nut, and washer connectors.
 - 1. Bolt Holes: Cut, drill, mechanically thermal cut, or punch standard bolt holes perpendicular to metal surfaces. Do not enlarge bolt holes by burning
 - 2. Baseplate Holes: Cut, drill, mechanically thermal cut, or punch holes perpendicular to steel surfaces.
- E. Perform thermal cutting by machine to greatest extent possible.
- F. Shop Connections:
 - 1. Shop install high-strength bolts according to RCSC's "Specification for Structural Joints Using High-Strength Bolts" for type of bolt and type of joint specified
 - 2. Comply with AWS D1.1/D1.1M for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.
- G. Develop required camber for members.
- H. Provide holes required for securing other work and for other work to pass through structural steel framing members.
 - 1. Cut, drill, thermal cut, or punch holes perpendicular to steel surfaces.
- I. Steel Headed Stud Anchors and Deformed Anchor Studs / Deformed Bar Anchors: Prepare steel surfaces as recommended by manufacturer of anchors. Use automatic end welding of anchors according to AWS D1.1/D1.1M and manufacturer's written instructions.
- J. Mark and match-mark materials for field assembly
- K. Complete structural-steel assemblies, including welding of units, before starting shop-priming operations, if applicable
- L. Accurately finish ends of columns and other members transmitting bearing loads.
- M. Splicing of members to obtain required lengths is not permitted without prior approval of structural Engineer-of-Record unless indicated on the Drawings.
- N. Substitutions: Where exact sizes and weights indicated on Drawings are not readily available, secure approval of alternate sizes from Structural Engineer-of Record in time to prevent project delay.

2.03 FINISH

- A. Prepare structural component surfaces exposed in final condition in accordance with SSPC-SP 3. Member shall be free of pock marks, roll marks, or protrusions, etc.
- B. Prepare structural component surfaces not exposed in final condition in accordance with SSPC-SP 2
- C. Shop prime structural steel members that are indicated to be painted, exposed to view, or exposed to weather.
 - 1. Immediately after surface preparation, apply primer according to manufacturer's written instructions and at rate recommended by SSPC to provide a minimum dry film thickness of 1.5 mils (0.038 mm). Use priming methods that result in full coverage of joints, corners, edges, and exposed surfaces.
 - a. Stripe paint corners, crevices, bolts, welds, and sharp edges.
 - b. Apply two coats of shop paint to surfaces that are inaccessible after assembly or erection
 - 2. Do not prime the following surfaces:
 - a. Surfaces embedded in concrete or mortar. Extend priming of partially embedded members to a depth of 2 inches (50 mm).

- b. Surfaces to be field welded, including top flange of beams to receive steel headed stud anchors.
 - c. Surfaces to be high-strength bolted with slip-critical connections.
 - d. Surfaces to receive sprayed fire-resistive materials (applied fireproofing).
 - e. Galvanized surfaces.
 - f. Will provide a finish system non-compatible with primer.
- D. Galvanize structural steel members to comply with ASTM A123/A123M where indicated on drawings. Provide minimum 1.7 oz/sq ft galvanized coating. (Provide minimum 530 g/sq m galvanized coating.)
 - 1. Fill vent and drain holes in closed sections (HSS or Pipe) that will be exposed in the finished Work unless they will function as weep holes, by plugging with zinc solder and filing off smooth.
 - 2. Galvanize lintels and shelf angles located in exterior walls.

EXECUTION

3.01 EXAMINATION

- A. Verify, with steel erector present, that conditions are appropriate for erection of structural steel and that the work may properly proceed.
 - 1. Verify elevations of concrete- and masonry-bearing surfaces and locations of anchor rods, bearing plates, and other embedments for compliance with requirements.
 - 2. Prepare a certified survey of bearing surfaces, anchor rods, bearing plates, and other embedments showing dimensions, locations, angles, and elevations.
- B. Proceed with installation only after unsatisfactory conditions have been corrected

3.02 ERECTION

- A. Erect structural steel in compliance with AISC 303.
- B. Maintain erection tolerances of structural steel within AISC's "Code of Standard Practice for Steel Buildings and Bridges."
- C. 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.
 - 1. Coordinate installation of non-structural steel items that load the temporarily supported steel frame such that temporary supports are adequate to resist all imposed loads.
 - 2. Do not remove temporary shoring supporting composite deck construction until cast-in-place concrete has attained its design compressive strength.
 - 3. Do not apply permanent loading other than the weight to supported concrete slab-on-deck assemblies to composite beams and girders until concrete has achieved 75 percent of its design strength without prior approval of structural Engineer-of-Record.
- D. Set structural steel accurately in locations and to elevations indicated and according to AISC 303 and AISC 360.
- E. Align and adjust various members that form part of complete frame or structure before permanently fastening. Before assembly, clean bearing surfaces and other surfaces that will be in permanent contact with members. Perform necessary adjustments to compensate for discrepancies in elevations and alignment.
 - 1. Level and plumb individual members of structure.
 - 2. Make allowances for difference between temperature at time of erection and mean temperature of 70° F (21° C) when structure is completed and in service.
- F. Splice members only where indicated.

- G. Clean concrete- and masonry-bearing surfaces of bond-reducing materials, and roughen surfaces prior to setting plates. Clean bottom surface of plates
 - 1. Set plates for structural members on wedges, shims, or setting nuts as required
 - 2. Weld plate washers to top of baseplate where indicated on Drawings.
 - 3. Snug-tighten anchor rods after supported members have been positioned and plumbed. Do not remove wedges or shims but, if protruding, cut off flush with edge of plate before packing with grout.
 - 4. Clean and moisten surfaces to receive grout. Immediately remove any remaining free water. Promptly pack grout solidly between bearing surfaces and plates so no voids remain. Neatly finish exposed surfaces; protect grout and allow to cure. Comply with manufacturer's written installation instructions for shrinkage-resistant grouts.
- H. Field weld components and shear studs indicated on shop drawings.
 - 1. Use automatic end welding of headed-stud shear connectors according to AWS D1.1/D1.1M and manufacturer's written instructions.
- I. Do not field cut or alter structural members without approval of Engineer of Record or Architect.
- J. Do not enlarge unfair holes in members by burning or using drift pins. Ream holes that must be enlarged to admit bolts
- K. Field Connections:
 - 1. Install high-strength bolts according to RCSC's "Specification for Structural Joints Using High-Strength Bolts" for type of bolt and type of joint specified.
 - 2. Comply with AWS D1.1/D1.1M for welded connections.
 - a. Comply with AISC 303 and AISC 360 for bearing, alignment, adequacy of temporary connections, and removal of paint on surfaces adjacent to field welds.
 - b. Remove backing bars or runoff tabs where indicated on Drawings, back gouge, and grind steel smooth.
 - c. Assemble and weld built-up sections by methods that will maintain true alignment of axes without exceeding tolerances in AISC's "Code of Standard Practice for Steel Buildings and Bridges" for mill material.
- L. After erection, prime welds, abrasions, and surfaces not shop primed, except surfaces to be in contact with concrete.
- M. Grout solidly between column plates and bearing surfaces, complying with manufacturer's instructions for nonshrink grout. Trowel grouted surfaces smooth, splaying neatly to 45 degrees.

3.03 TOLERANCES

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

3.04 FIELD QUALITY CONTROL

- A. An independent testing agency will perform field quality control tests, as specified in Section 014000 - Quality Requirements& 014533 - Code-required Special Inspections and Procedures

3.05 REPAIRS AND PROTECTION

- A. Galvanized Surfaces: Clean areas where galvanizing is damaged or missing and repair galvanizing to comply with ASTM A 780.
- B. Touchup Painting: Cleaning and touchup painting are specified in Section 099113 "Exterior Painting" Section 099123 "Interior Painting."

END OF SECTION 051200

SECTION 052100 - STEEL JOIST FRAMING

GENERAL

1.01 SECTION INCLUDES

- A. Open web steel joists, 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 18 inches (450 mm).

1.02 RELATED REQUIREMENTS

- A. Section 051200 - Structural Steel Framing: Superstructure framing.
- B. Section 053100 - Steel Decking: Support framing for openings less than 18 inches (450 mm) in decking.

1.03 REFERENCE STANDARDS

- A. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2019.
- B. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2023.
- C. ASTM A307 - Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength; 2021.
- D. ASTM A563/A563M - Standard Specification for Carbon and Alloy Steel Nuts (Inch and Metric); 2021a.
- E. ASTM F3125/F3125M - Standard Specification for High Strength Structural Bolts and Assemblies, Steel and Alloy Steel, Heat Treated, Inch Dimensions 120 ksi, 144 ksi, and 150 ksi Minimum Tensile Strength, and Metric Dimensions 830 MPa and 1040 MPa Minimum Tensile Strength; 2025.
- F. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2025, with Amendment (2026).
- G. SJI 100 - Standard Specifications for K-Series, LH-Series, and DLH-Series Open Web Steel Joists, and for Joist Girders; 2020.
- H. SJI Technical Digest No. 9 - Handling and Erection of Steel Joists and Joist Girders; 2025.
- I. SSPC-Paint 15 - Steel Joist Shop Primer/Metal Building Primer; 2004.
- J. SSPC-SP 2 - Hand Tool Cleaning; 2024.

1.04 SUBMITTALS

- A. See Section 013000 - 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.
 - 1. Reproduction of Construction Documents not permitted.
- C. Manufacturer's Qualification Statement.
- D. Erector's Qualification Statement.
- E. Design Calculations:
 - 1. Submit 1 set of calculations for record for the design of all non-uniformly loaded joists and top and bottom chord extensions for the loads indicated on the Drawings. Calculations shall demonstrate compliance with the governing building code and with all requirements

in the Contract Documents. Calculations shall be prepared and stamped by a Professional Engineer registered in the state of the project.

1.05 QUALITY ASSURANCE

- A. Perform Work, including that for headers and other supplementary framing, in accordance with SJI 100 Standard Specifications Load Tables and SJI Technical Digest No. 9.
- B. Welder Qualifications: Welding processes and welding operators qualified in accordance with AWS D1.1/D1.1M and dated no more than 12 months before start of scheduled welding work.
- C. Manufacturer Qualifications: A manufacturer certified by SJI to manufacture joists complying with applicable standard specifications and load tables in SJI's "Specifications"
 - 1. Manufacturer's responsibilities include providing professional engineering services for designing special joists to comply with performance requirements
- D. Erector Qualifications: Company specializing in performing the work of this section with minimum 5 years documented experience with a record of successful in-service performance on projects with similar material, design and scope to this Project.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Transport, handle, store, and protect products to SJI requirements.
- B. Protect joists from corrosion, deformation, and other damage during delivery, storage, and handling.

PRODUCTS

2.01 MANUFACTURERS

- A. Steel Joists:
 - 1. Canam Group Inc: www.canam-steeljoists.ws
 - 2. Nucor-Vulcraft Group: www.vulcraft.com/#sle.
 - 3. Substitutions: See Section 016000 - Product Requirements.

2.02 MATERIALS

- A. Open Web Joists: SJI 100 As indicated on Drawings.
 - 1. Provide bottom and top chord extensions as indicated on Drawings.
 - 2. Minimum End Bearing on Steel Supports: Comply with referenced SJI standards and as indicated on Drawings.
 - a. Equip bearing ends of joists with manufacturer's standard beveled ends or sloped shoes if joist slope exceeds 1/4 inch per 12 inches (1:48).
 - 3. Minimum End Bearing on Masonry or Concrete Supports: Comply with referenced SJI standards and as indicated on Drawings.
 - a. Equip bearing ends of joists with manufacturer's standard beveled ends or sloped shoes if joist slope exceeds 1/4 inch per 12 inches (1:48).
 - 4. Finish: Shop primed.
 - 5. Camber according to SJI's "Specifications" or as indicated on Drawings.
- B. Accessories:
 - 1. Bridging: Provide bridging anchors and number of rows of horizontal or diagonal bridging of material, size, and type required by SJI's "Specifications" for type of joist, chord size, spacing, and span or as schematically indicated; detailed and fabricated according to SJI's "Specifications". Furnish additional erection bridging if required for stability.

2. Furnish ceiling extensions, either extended bottom-chord elements or a separate extension unit of enough strength to support ceiling construction for loads indicated. Extend ends to within 1/2 inch (13 mm) of finished wall surface unless otherwise indicated.
- C. Anchor Bolts, Nuts and Washers: As indicated on Drawings
- D. High-Strength Structural Bolts, Nuts, and Washers: As specified in Section 051200 - "Structural Steel Framing"
- E. Structural Steel For Supplementary Framing and Joist Leg Extensions: ASTM A36/A36M.
- 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.

2.03 FABRICATION

- A. Frame special sized openings in joist web framing as detailed.

2.04 FINISH

- A. Shop prime joists as specified.
 1. Do not prime surfaces that will be fireproofed.
 2. Apply one coat of shop primer to joists and joist accessories to be primed to provide a continuous, dry paint film not less than 0.8 mil (0.025 mm) thick.
- B. Prepare surfaces to be finished in accordance with SSPC-SP 2.
- C. Primer: SSPC-Paint 15, or manufacturer's standard shop primer complying with performance requirements in SSPC-Paint 15.

EXECUTION

3.01 EXAMINATION

- A. Verify existing conditions prior to beginning work. Examine supporting substrates, embedded bearing plates, and abutting structural framing for compliance with requirements for installation tolerances and other conditions affecting performance.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 ERECTION

- A. Do not install joists until supporting construction is in place and secured.
- B. Erect joists with correct bearing on supports.
- C. Allow for erection loads. Provide sufficient temporary bracing to maintain framing safe, plumb, and in true alignment.
- D. Install joists and accessories plumb, square, and true to line; securely fasten to supporting construction according to SJI's "Specifications," joist manufacturer's written recommendations, and requirements in this Section.
 1. Before installation, splice joists delivered to Project site in more than one piece.
 2. Space, adjust, and align joists accurately in location before permanently fastening.
 3. Install temporary bracing and erection bridging, connections, and anchors to ensure that joists are stabilized during construction.
 4. Bottom chord extension shall not be rigidly connected to supports or other elements unless specifically indicated. Where indicated, delay rigidly connecting bottom chord

extensions until substantial dead loads, including metal deck, slabs-on-deck-, roofing materials, and other loads indicated on drawings have been applied.

- E. Coordinate the placement of anchors for securing loose bearing members furnished as part of the work of this section.
- F. After joist alignment and installation of framing, field weld joist seats to steel bearing surfaces.
- G. Coordinate placement of bearing plates and anchors in concrete and masonry construction for securing bearing plates.
- H. Position and field weld joist chord extensions and wall attachments as detailed or as required by joist manufacturer.
- I. Install supplementary framing for floor and roof openings as indicated on Drawings.
- J. 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.
- K. Do not field cut or alter structural members without approval of joist manufacturer.
- L. Install and connect bridging concurrently with joist erection, before construction loads are applied. Anchor ends of bridging lines at top and bottom chords if terminating at walls or beams.
- M. Coordinate location of bracing and bridging with locations shown for ductwork.
- N. After erection, prime welds, damaged shop primer, damaged galvanizing, and surfaces not shop primed , except surfaces specified not to be primed.

3.03 TOLERANCES

- A. Maximum Variation From Plumb: 1/4 inch (6 mm).
- B. Maximum Offset From True Alignment: 1/4 inch (6 mm).

3.04 FIELD QUALITY CONTROL

- A. An independent testing agency will perform field quality control tests, as specified in Section 014000 - Quality Requirements & 014533 - Code-required Special Inspections and Procedures

END OF SECTION 052100

SECTION 053100 - STEEL DECKING

GENERAL

1.01 SECTION INCLUDES

- A. Acoustical roof deck.
- B. Roof deck.
- C. Composite floor deck.
- D. Supplementary framing for openings up to and including 18 inches (450 mm).
- E. Bearing plates and angles.
- F. Stud shear connectors.
- G. Acoustical insulation in roof deck flutes.

1.02 RELATED REQUIREMENTS

- A. Section 033000 - Cast-in-Place Concrete: Concrete topping over metal deck.
- B. Section 042010 - Structural Reinforced Unit Masonry: Placement of anchors for bearing plates embedded in unit masonry assemblies.
- C. Section 052100 - Steel Joist Framing: Support framing for openings larger than 18 inches (450 mm) and shear stud connectors.
- D. Section 052100 - Steel Joist Framing: Placement of embedded steel anchors for bearing plates and joist seats in cast-in-place concrete.
- E. Section 055000 - Metal Fabrications: Steel angle concrete stops at deck edges.

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; 2024.
- C. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2024.
- D. ASTM A510/A510M - Standard Specification for General Requirements for Wire Rods and Coarse Round Wire, Carbon Steel, and Alloy Steel; 2025.
- E. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2025.
- 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; 2024.
- G. ASTM B633 - Standard Specification for Electrodeposited Coatings of Zinc on Iron and Steel; 2023.
- H. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2025, with Amendment (2026).
- I. AWS D1.3/D1.3M - Structural Welding Code - Sheet Steel; 2025, with Errata (2026).
- J. FM DS 1-28 - Wind Design; 2015, with Editorial Revision (2026).
- K. FM DS 1-29 - Roof Deck Securement and Above-Deck Roof Components; 2016, with Editorial Revision (2022).
- L. ICC-ES AC43 - Acceptance Criteria for Steel Deck Roof and Floor Systems; 2022.

- M. ICC-ES AC70 - Acceptance Criteria for Power-Actuated Fasteners Driven into Concrete, Steel and Masonry Elements; 2019, with Editorial Revision (2021).
- N. SDI (DM) - Publication No.30, Design Manual for Composite Decks, Form Decks, and Roof Decks; 2007.
- O. SSPC-Paint 15 - Steel Joist Shop Primer/Metal Building Primer; 2004.
- P. SSPC-Paint 20 - Zinc-Rich Coating (Type I - Inorganic, and Type II - Organic); 2019.

1.04 SUBMITTALS

- A. See Section 013000 - Administrative Requirements, for submittals procedures.
- B. Product Data: Provide deck profile characteristics, dimensions, structural properties, and finishes.
- C. Shop Drawings: Indicate deck plan, support locations, projections, openings, reinforcement, pertinent details, and accessories.
 - 1. Reproduction of Construction Documents is not permitted.
- D. Certificates: Certify that products furnished meet or exceed specified requirements.
 - 1. Acoustical roof deck
 - 2. Power-actuated fasteners
- E. Installer's Qualification Statement in compliance with QUALITY ASSURANCE section below.

1.05 QUALITY ASSURANCE

- A. Fabricator Qualifications: Company specializing in performing the work of this Section with minimum 5 years of experience with a record of successful in-service performance on projects with similar material, design and scope to this Project.
- B. Installer Qualifications: Company specializing in performing the work of this Section with minimum 5 years of experience with a record of successful in-service performance on projects with similar material, design and scope to this Project.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Cut plastic wrap to encourage ventilation.
- B. Store deck on dry wood sleepers; slope for positive drainage.

PRODUCTS

2.01 STEEL DECK

- A. All Deck Types: Select and design metal deck in accordance with SDI Design Manual.
 - 1. Comply with calculated structural characteristics of steel deck according to AISI's "North American Specification for the Design of Cold-Formed Steel Structural Members."
- B. Acoustical Roof Deck: Non-composite type, steel sheet with plain vertical flute faces perforated with 1/8 inch (3 mm) diameter holes staggered 3/8 inch (10 mm) on center:
 - 1. Structural Properties: Structural Steel (SS), grade, thickness and profile as indicated on the structural drawings
 - 2. At interior locations: Prime-Painted Steel Sheet: ASTM A 1008/A 1008M, minimum G60 (Z180) zinc coating, shop primed with manufacturer's standard baked-on, rust-inhibitive primer.
 - 3. At exterior locations not indicated to be painted: Galvanized Steel Sheet: ASTM A653/A653M, G90 (Z275) zinc coating.

4. At exterior locations indicated to be painted: Galvanized Steel Sheet: ASTM A653/A653M, G90 (Z275) zinc coating; cleaned, pretreated, and primed with manufacturer's standard baked-on, rust-inhibitive primer
- C. Roof Deck: Non-composite type, fluted steel sheet:
1. Structural Properties: Structural Steel (SS), grade, thickness and profile as indicated on the structural drawings
 2. At interior locations: Prime-Painted Steel Sheet: ASTM A 1008/A 1008M, minimum G60 (Z180) zinc coating, shop primed with manufacturer's standard baked-on, rust-inhibitive primer.
 3. At exterior locations not indicated to be painted: Galvanized Steel Sheet: ASTM A653/A653M, G90 (Z275) zinc coating.
 4. At exterior locations indicated to be painted: Galvanized Steel Sheet: ASTM A653/A653M, G90 (Z275) zinc coating; cleaned, pretreated, and primed with manufacturer's standard baked-on, rust-inhibitive primer
- D. Composite Floor Deck: Fluted steel sheet embossed to interlock with concrete:
1. Structural Properties: Structural Steel (SS), grade, thickness and profile as indicated on the structural drawings
 2. At interior locations: Prime-Painted Steel Sheet: ASTM A 1008/A 1008M, with top surface phosphatized and unpainted and underside surface shop primed with manufacturers' standard baked-on, rust-inhibitive primer.
 3. At exterior locations not indicated to be painted: Galvanized Steel Sheet: ASTM A653/A653M, G90 (Z275) zinc coating.
 4. At exterior locations indicated to be painted: Galvanized Steel Sheet: ASTM A653/A653M, G90 (Z275) zinc coating; cleaned, pretreated, and primed with manufacturer's standard baked-on, rust-inhibitive primer

2.02 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. Powder Actuated Mechanical Fasteners: Steel; with knurled shank and forged ballistic point. Comply with applicable requirements of ICC-ES AC70.
 1. Material: Steel; ASTM A510/A510M.
 - a. Hardness: Rockwell C 54.5, minimum.
 - b. Corrosion Resistance:
 - 1) Steel Bar Joist Framing Applications: ASTM B633, SC1, Type III zinc electroplate.
 - 2) Exposed Roof Deck Applications: Provide manufacturer's standard stainless steel sealing caps with bonded neoprene washer over each fastener.
- F. 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.
 2. Fasteners for Exposed Steel Roof Deck Application: Manufacturer's standard stainless steel with bonded neoprene washer.
- G. Weld Washers: Mild steel, uncoated, 3/4 inch (19 mm) outside diameter, 1/8 inch (3 mm) thick.
- H. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.
- I. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20, complying with VOC limitations of authorities having jurisdiction.

- J. Flute Closures: Closed cell foam rubber, 1 inch (25 mm) thick; profiled to fit tight to the deck.
- K. Acoustical Insulation: Glass fiber type, minimum 1.1 lb/cu ft (18 kg/cu m) density; profiled to suit deck.

2.03 FABRICATED DECK ACCESSORIES

- A. Sheet Metal Deck Accessories: Metal closure strips, wet concrete stops, and cover plates, profile, size, material, and thickness to match deck as indicated, but not less than recommended by SDI for overhang and slab depth; finished same as deck.

EXECUTION

3.01 EXAMINATION

- A. Verify existing conditions prior to beginning work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.
- C. When steel headed stud anchors are to be welded through metal deck and/or corrugated metal forming, the top flange of beams to receive such anchors shall be unpainted and free of debris prior to installation of the deck and/or forming.

3.02 INSTALLATION

- A. Erect metal deck in accordance with SDI Design Manual and manufacturer's instructions. Align and level.
- B. Place deck bundles to prevent overloading of structural members.
- C. On concrete and masonry surfaces provide bearing as required by deck manufacturer or as indicated on Drawings, minimum
- D. On steel supports provide bearing as required by deck manufacturer or as indicated on Drawings, minimum.
- E. Place deck panels flat and square and fasten to supporting frame without warp or deflection
- F. Fasten deck to steel support members at ends and intermediate supports as indicated on Drawings.
 - 1. Welding: Use fusion welds through weld washers.
 - 2. Do not stretch or contract side-lap interlocks.
 - 3. Align cellular deck panels over full length of cell runs and align cells at ends of abutting panels.
- G. At mechanically fastened male/female side laps fasten as indicated on Drawings.
- H. Drive mechanical sidelap connectors completely through adjacent lapped sheets; positively engage adjacent sheets with minimum three-thread penetration.
- I. Weld deck in accordance with AWS D1.3/D1.3M.
- J. Cut and neatly fit deck panels and accessories around openings and other work projecting through or adjacent to deck
- K. Provide additional reinforcement and closure pieces at openings as required for strength, continuity of deck, and support of other work.
 - 1. Refer to Drawings for opening sizes requiring reinforcement and typical reinforcement options.
 - 2. Miscellaneous openings not shown on the Drawings such as those required for vents, risers, conduits, etc. shall be cut and reinforced if necessary, by the trade requiring the opening.

- 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. Do not place conduits or piping horizontal in composite slab.
- P. Immediately after welding deck and other metal components in position, coat welds, burned areas, and damaged surface coating, with touch-up primer.
- Q. Steel headed stud anchors in composite slabs:
 - 1. Field welded to the structural members only after all steel framing, deck is in place and shored when required. Deck shall be installed such that the bottom rib plate is in continuous contact with the surface to receive anchors.
 - 2. Capacity: Number of steel headed stud anchors indicated on Drawings is based on the allowable capacity for anchors in normal weight or light weight concrete as listed in AISC 360 for the composite deck specified. If additional anchors are required due to decreases in anchor capacity for the type of deck and stud placement supplied, such additional anchors shall be provided at no additional cost to the Owner.
 - 3. Installation:
 - a. Install anchors in accordance with Manufacturer's instructions. Use only personnel and equipment authorized by the Manufacturer.
 - b. Use through-deck anchor welding where deck material thickness permits proper weld fusion to develop required anchor capacity. Provide adequate test results to verify feasibility of through-deck welding for the particular anchor sizes and deck thicknesses involved.
 - c. At the beginning of each shift of work, and after each time welding equipment has been moved, two test anchors shall be installed and bent to 45 degrees by the Contractor. If failure occurs, adjust equipment and repeat test. Two consecutive test studs shall be welded and found satisfactory before production for that shift begins or is resumed.

3.03 FIELD QUALITY CONTROL

- A. An independent testing agency will perform field quality control tests, as specified in Section 014000 - Quality Requirements & 014533 - Code-required Special Inspections and Procedures

3.04 REPAIRS AND PROTECTION

- A. Galvanized Surfaces: Where deck is exposed to weather or moisture, clean areas where galvanizing is damaged or missing and repair galvanizing to comply with ASTM A 780.
- B. Touchup Painting: Cleaning and touchup painting are specified in Section 099113 "Exterior Painting" Section 099123 "Interior Painting."
- C. Provide final protection and maintain conditions to ensure that steel deck is without damage or deterioration at time of Substantial Completion.
 - 1. Do not use deck units for storage or as a working platform until permanently secured in position.
 - 2. Contractor shall assure that completed deck is not damaged by use as a runway, storage of materials or subsequent work.
 - 3. Contractor shall assure that construction loads are not allowed which exceed the safe carrying capacity of the deck.

END OF SECTION 053100

SECTION 054000 - COLD-FORMED METAL FRAMING

GENERAL

1.01 SECTION INCLUDES

- A. Steel stud exterior wall and soffit framing.

1.02 RELATED REQUIREMENTS

- A. Section 072100 - Thermal Insulation: Insulation within framing members.
- B. Section 092116 - Gypsum Board Assemblies: Cold-formed steel nonstructural framing.
- C. Section 092116 - Gypsum Board Assemblies: Gypsum-based sheathing.

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 A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2023.
- E. ASTM A780/A780M - Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings; 2020.
- F. ASTM A1003/A1003M - Standard Specification for Steel Sheet, Carbon, Metallic- and Nonmetallic-Coated for Cold-Formed Framing Members; 2015.
- G. ASTM C1007 - Standard Specification for Installation of Load Bearing (Transverse and Axial) Steel Studs and Related Accessories; 2020 (Reapproved 2024).
- H. AWS B2.1/B2.1M - Specification for Welding Procedure and Performance Qualification; 2021, with Errata (2023).
- I. AWS D1.3/D1.3M - Structural Welding Code - Sheet Steel; 2025, with Errata (2026).
- J. ICC (IBC) - International Building Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- K. SSPC-Paint 20 - Zinc-Rich Coating (Type I - Inorganic, and Type II - Organic); 2019.

1.04 SUBMITTALS

- A. See Section 013000 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide data on cold-formed steel structural members; include material descriptions and base steel thickness.
- C. Product Data: Provide manufacturer's data on factory-made connectors and mechanical fasteners and accessories, showing compliance with requirements.
- D. Shop Drawings: Indicate component details, framed openings, bearing, anchorage, loading, welds, and type and location of fasteners, and accessories or items required of related work.
 - 1. Provide $\frac{1}{4}" = 1'-0"$ scale elevations of all walls and plans of all soffits comprised of cold-formed metal framing. Show layout, spacings, sizes, thicknesses, and types of cold-formed metal framing; fabrication; and fastening and anchorage details, including

- mechanical fasteners. Show reinforcing channels, opening framing, supplemental framing, strapping, bracing, bridging, splices, accessories, connection details, and attachment to adjoining work.
 - a. Do NOT reproduce Construction Documents, including details in submittals.
- 2. Describe method for securing studs to tracks and for bolted framing connections.
- E. Design Data:
 - 1. Shop drawings signed and sealed by a professional structural engineer.
 - 2. Design calculations sufficient to demonstrate compliance with design criteria and loading as indicated on Drawings; signed and sealed by a professional structural engineer.
 - a. Design framing system to maintain clearances at openings, to allow for construction tolerances, and to accommodate deflection of primary building structure, as indicated on the Drawings.
- F. Designer's Qualification Statement.
- G. Manufacturer's Qualification statement.
- H. Product Test Reports: Provide manufacturer's test reports verifying vertical deflection clips & horizontal drift deflection clips comply with requirements based on evaluation of comprehensive tests.
- I. Welders' Qualification Statement: Welders' certificates in accordance with AWS B2.1/B2.1M and dated no more than 12 months before the start of scheduled welding work.
- J. SSMA Manufacturer Qualification: Submit documentation of manufacturer association membership.

1.05 QUALITY ASSURANCE

- A. See Section 014000 - Quality Requirements & 014533 - Code-required Special Inspections and Procedures for additional requirements.
 - 1. Special Inspections and Testing: Special inspections and tests indicated on the construction documents and indicated within this specification are minimum requirements. The cold-formed metal framing construction documents shall include the minimum testing and inspection requirements as indicated on the construction documents and shall include additional testing and inspections that the engineer of the cold-formed metal framing engineer requires. All special inspections and tests (minimum design requirements on construction documents and those specified by cold-formed metal framing engineer) shall be paid for by the Owner.
- B. Designer Qualifications: Design framing system under direct supervision of a professional structural engineer experienced in designing this work and licensed in the State in which the Project is located.
- C. Manufacturer Qualifications:
 - 1. Company specializing in manufacturing the types of products specified in this section, and with minimum 5 years of documented experience.
- D. Welder Qualifications: Welding processes and welding operators qualified in accordance with AWS D1.1/D1.1M and AWS D1.3/D1.3M and dated no more than 12 months before start of scheduled welding work.
- E. Installer Qualifications: Company specializing in performing the work of this section with minimum three years documented experience and approved by manufacturer.

1.06 PRE-INSTALLATION MEETING

- A. A minimum of one week before starting work of this section, the Contractor shall conduct a Pre-Installation Meeting.
 - 1. Required Attendance

- a. General Contractor
 - b. Section 05 40 00 contractor(s) & relevant installers
 - c. Special Inspector
- 2. The Architect, Structural Engineer, and Owner will also attend.
- 3. Issues and procedures that shall be discussed at the Pre-Installation Meeting:
 - a. Critical structural items
 - b. Special inspection requirements
 - c. Aesthetic considerations
- 4. The contractor shall prepare minutes of the meeting and shall furnish a copy to each attendee and others needing the information

1.07 MOCK-UPS

- A. See Section 014000 - Quality Requirements for additional requirements.
- B. Provide mock-up of exterior framed wall, including components specified elsewhere, such as insulation, sheathing, window frame, door frame, exterior wall finish, and interior wall finish.
- C. Locate where directed.
- D. Mock-up may remain as part of the Work.

PRODUCTS

2.01 MANUFACTURERS

- A. Structural Framing, :
 - 1. CEMCO: www.cemcosteel.com/#sle.
 - 2. ClarkDietrich: www.clarkdietrich.com/#sle.
 - 3. MarinoWARE: www.marinoware.com/#sle.
 - 4. SCAFCO Corporation: www.scafco.com/#sle.
 - 5. The Steel Network, Inc: www.SteelNetwork.com/#sle.
 - 6. Substitutions: See Section 016000 - Product Requirements.
- B. Connectors:
 - 1. Same manufacturer as metal framing.

2.02 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 and as indicated on Drawings.
- B. Design Criteria: In accordance with applicable codes. and as indicated on Drawings.
 - 1. Primary frame deflections as indicated on Drawings.
 - 2. Able to tolerate movement of components without damage, failure of joint seals, undue stress on fasteners, or other detrimental effects when subject to seasonal or cyclic day/night temperature ranges.
 - 3. Able to accommodate construction tolerances, deflection of building structural members, and clearances of intended openings.
- C. Fabrication:
 - 1. Shop-fabricate cold-formed framing systems and connectors to the greatest extent possible.
 - 2. Deliver to project site in largest practical sections.

2.03 MATERIALS

- A. Steel Sheet: ASTM A1003/A1003M, subject to the ductility limitations indicated in AISI S240.

1. Structural Grade: As required to meet design criteria and cladding attachment requirements.
2. Corrosion Protection Coating Designation: CP 60 in accordance with AISI S240.

2.04 STRUCTURAL FRAMING COMPONENTS

- A. Wall Studs and Track Sections: AISI S240; c-shaped studs and u-shaped track sections in stud-matching nominal width and compatible height.
- B. Jamb Studs: AISI S240; manufactured, engineered, c-shaped with wide flanges, designed to replace conventional double-stud framing at openings.
- C. Headers: AISI S240; manufactured, engineered assemblies, with wide flanges, designed to replace conventional box or nested header framing at openings.
- D. Jamb Mounting Clips: Manufacturer's standard.

2.05 CONNECTIONS

- A. Performance Requirements: Provide connections in compliance with requirements of AISI S240.
- B. Steel Sheet: ASTM A 653/A 653M, structural steel, G90(Z275) zinc coated, grade as required to meet design criteria.
- C. Structural Performance: Maintain load and movement capacity required by applicable building code and specified design criteria.
- D. Vertical Movement Connections: Provide mechanical anchorage devices that accommodate movement using slotted holes, shouldered screws or screws and anti-friction or stepped bushings, while maintaining structural performance of framing. Provide movement connections where indicated on drawings.
 1. Where continuous studs bypass elevated floor slab, connect stud to slab in manner allowing vertical movement of slab without affecting studs.
 2. Where top of stud wall terminates below structural floor or roof, connect studs to structure in manner allowing vertical movement of slab without affecting studs.
 3. Provide top track preassembled with connection devices spaced to fit stud spacing indicated on drawings; minimum track length of 10 feet (3048 mm).
- E. Horizontal Movement Connections/Drift Clips: Manufacturer's standard bypass or head clips, capable of isolating wall stud from upward and downward vertical displacement and lateral drift of primary structure.
- F. Fixed Connections: Provide nonmovement devices for tie-down to foundation, floor-to-floor tie-down, roof-to-wall tie-down, joist hangers, gusset plates, and stiffeners.
- G. Bridging Connections: Provide mechanical load-transferring devices that accommodate wind load torsion and weak axis buckling induced by axial compression loads. Provide bridging connectors where indicated on the drawings and as required by cold-formed design.

2.06 MISCELLANEOUS CONNECTIONS

- A. Self-Drilling, Self-Tapping Screws, Bolts, Nuts and Washers: Hot-dip galvanized per ASTM A153/A153M.
- B. Anchorage Devices:
 1. Powder actuated.: fabricated from corrosion-resistant materials, with capability to sustain, without failure, a load equal to 5 times design load, as determined by testing per ASTM E 1190 conducted by a qualified independent testing agency.

2. Anchor Bolts: ASTM F 1554, Grade 55, threaded carbon-steel and carbon-steel nuts; and flat, hardened-steel washers, zinc coated by hot-dip process according to ASTM A153/A 153M, Class C.
 3. Expansion & Screw Anchors: Fabricated from corrosion-resistant materials, with capability to sustain, without failure, a load equal to 5 times design load, as determined by testing per ASTM E 488 conducted by a qualified independent testing agency.
- C. Welding: Comply with AWS D1.1/D1.1M.

2.07 ACCESSORIES

- A. Fabricate steel-framing accessories from steel sheet, ASTM A 1003/A 1003M, Structural Grade, Type H, metallic coated, of same grade and coating weight used for framing members.
- B. Provide accessories of manufacturer's standard thickness and configuration, unless otherwise indicated, as follows:
 1. Supplementary framing.
 2. Bracing, bridging, and solid blocking.
 3. Web stiffeners.
 4. Anchor clips.
 5. End clips.
 6. Foundation clips.
 7. Gusset plates.
 8. Stud kickers, knee braces, and girts.
 9. Joist hangers and end closures.
 10. Hole reinforcing plates.
 11. Backer plates.
- C. Sealer Gaskets: Closed-cell neoprene foam, 1/4 inch (6.4 mm) thick, selected from manufacturer's standard widths to match width of bottom track or rim track members.
- D. Galvanizing Repair: Touch up bare steel with zinc-rich paint in compliance with ASTM A780/A780M.
- E. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20 Type I - Inorganic, complying with VOC limitations of authorities having jurisdiction.

EXECUTION

3.01 EXAMINATION

- A. Verify that substrate surfaces are ready to receive work.
- B. Verify field measurements and adjust installation as required.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION

- A. Structural Wall Foundations: For gaps between wall bottom track and top of foundation 1/4 inch (6.4 mm) or greater, level substrate with loadbearing shims or grout between track and foundation.
- B. Install sealer gaskets to isolate the underside of wall bottom track or rim track and the top of foundation wall or slab at stud or joist locations.

3.03 FABRICATION

- A. Fabricated structural members and connections in compliance with ASTM C1007.

1. Fabricate cold-formed metal framing and accessories plumb, square, and true to line, and with connections securely fastened and as follows:
 - a. Fabricate framing assemblies using jigs or templates.
 - b. Cut framing members by sawing or shearing; do not torch cut.
 - c. Fasten other materials to cold-formed metal framing by welding, bolting, or screw fastening, according to Shop Drawings.
2. Reinforce, stiffen, and brace framing assemblies to withstand handling, delivery, and erection stresses. Lift fabricated assemblies to prevent damage or permanent distortion.

3.04 INSTALLATION - GENERAL

- A. Install structural members and connections in compliance with ASTM C1007.
- B. Cold-formed metal framing may be shop or field fabricated for installation, or it may be field assembled
- C. Install shop- or field-fabricated, cold-formed framing and securely anchor to supporting structure.
 1. Screw, bolt, or weld wall panels at horizontal and vertical junctures to produce flush, even, true-to-line joints with maximum variation in plane and true position between fabricated panels not exceeding 1/16 inch (1.6 mm).
- D. Cut framing members by sawing or shearing; do not torch cut.
- E. Fasten cold-formed metal framing members by welding, screw fastening, clinch fastening, or riveting. Wire tying of framing members is not permitted.
 1. Comply with AWS D1.3 requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.
 2. Locate mechanical fasteners and install according to Shop Drawings, and complying with requirements for spacing, edge distances, and screw penetration.
- F. Install framing members in one-piece lengths unless splice connections are indicated for track or tension members.
- G. Install temporary bracing and supports to secure framing and support loads comparable in intensity to those for which structure was designed. Maintain braces and supports in place, undisturbed, until entire integrated supporting structure has been completed and permanent connections to framing are secured.
- H. Do not bridge building expansion and control joints with cold-formed metal framing. Independently frame both sides of joints.
- I. Fasten hole reinforcing plate over web penetrations that exceed size of manufacturer's standard punched openings

3.05 INSTALLATION OF STUDS

- A. Install wall studs plumb and level unless required otherwise in Drawings.
- B. Install continuous tracks sized to match studs. Align tracks accurately and securely anchor to supporting structure as indicated.
 1. Fasten both flanges of studs to top and bottom track, unless otherwise indicated.
- C. Construct corners using minimum of three studs. Install double studs at wall openings, door and window jambs.
- D. Install studs full length in one piece. Splicing of studs is not permitted.
- E. Install studs; brace, and reinforce to develop full strength and achieve design requirements.
 1. Install horizontal bridging in wall studs, spaced in rows indicated on Shop Drawings but not more than 48 inches (1220 mm) apart. Fasten at each stud intersection.

- a. Bridging: Cold-rolled steel channel, welded or mechanically fastened to webs of punched studs.
- 2. Install miscellaneous framing and connections, including stud kickers, web stiffeners, clip angles, continuous angles, anchors, fasteners, and stud girts, to provide a complete and stable wall-framing system.
- F. Coordinate placement of insulation in multiple stud spaces made inaccessible after erection.
- G. Install intermediate studs above and below openings to align with wall stud spacing.
- H. Provide deflection allowance in stud track, directly below horizontal building framing at non-loadbearing framing.
- I. Isolate non-load-bearing steel framing from building structure to prevent transfer of vertical loads while providing lateral support.
 - 1. Connect vertical deflection clips to bypassing and infill studs and anchor to building structure.
 - 2. Connect drift clips to cold formed metal framing and anchor to building structure.
- J. Attach cross studs to studs for attachment of fixtures anchored to walls.
- K. Install framing between studs for attachment of mechanical and electrical items, and to prevent stud rotation.
- L. Touch-up field welds and damaged corrosion-protected surfaces zinc-rich paint in compliance with ASTM A780/A780M.
- M. Touch-up field welds and damaged corrosion protected surfaces with primer.

3.06 FIELD QUALITY CONTROL

- A. See Section 014000 - Quality Requirements, & 014533 - Code-required Special Inspections and Procedures for additional requirements.

3.07 TOLERANCES

- A. Studs - Vertical Alignment (Plumbness): 1/960 of span or 1/8 inch in 10 ft (3.2 mm in 3000 mm), in accordance with ASTM C1007.
- B. Studs - Maximum Variation from True Position: 1/8 inch (3.2 mm) in accordance with ASTM C1007.
- C. Stud Spacing: 1/8 inch (3.2 mm) from the designated spacing, provided that the cumulative error does not exceed the requirements of the finishing materials in accordance with ASTM C1007.
- D. Maximum Variation of any Member from Plane: 1/8 inch (3.2 mm).

END OF SECTION 054000

SECTION 055000 - METAL FABRICATIONS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Shop fabricated steel and aluminum items.
- B. Steel framing and supports for mechanical and electrical equipment.
- C. Steel framing and supports for applications where framing and supports are not specified in other Sections.
- D. Miscellaneous steel trim.
- E. Metal access gate.
- F. Trash enclosure gates
- G. 6" diameter Steel Bollards
- H. Elevator pit ladder
- I. Metal Ladders
- J. Perforated Metal for Railing

1.02 RELATED REQUIREMENTS

- A. Section 033000 - Cast-in-Place Concrete: Placement of metal fabrications in concrete.
- B. Section 042000 - Unit Masonry: Placement of metal fabrications in masonry.
- C. Section 051200 - Structural Steel Framing: Structural steel column anchor bolts.
- D. Section 052100 - Steel Joist Framing: Structural joist bearing plates, including anchorage.
- E. Section 053100 - Steel Decking: Bearing plates for metal deck bearing, including anchorage.
- F. Section 055100 - Metal Stairs.
- G. Section 055133 - Metal Ladders.
- H. Section 055213 - Pipe and Tube Railings.

1.03 REFERENCE STANDARDS

- A. AAMA 611 - Specification for Anodized Architectural Aluminum; 2024.
- 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; 2024.
- D. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2024.
- E. ASTM A283/A283M - Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates; 2024.
- F. ASTM A307 - Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength; 2021.

- G. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes; 2023.
- H. ASTM A666/A666M - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2024.
- I. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2021.
- J. ASTM F3125/F3125M - Standard Specification for High Strength Structural Bolts and Assemblies, Steel and Alloy Steel, Heat Treated, Inch Dimensions 120 ksi, 144 ksi, and 150 ksi Minimum Tensile Strength, and Metric Dimensions 830 MPa and 1040 MPa Minimum Tensile Strength; 2025.
- K. AWS B2.1/B2.1M - Specification for Welding Procedure and Performance Qualification; 2021, with Errata (2023).
- L. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2025, with Errata (2026).
- M. AWS D1.2/D1.2M - Structural Welding Code - Aluminum; 2014, with Errata (2020).
- N. SSPC-Paint 15 - Steel Joist Shop Primer/Metal Building Primer; 2004.
- O. SSPC-Paint 20 - Zinc-Rich Coating (Type I - Inorganic, and Type II - Organic); 2019.

1.04 SUBMITTALS

- A. See Section 013000 - 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.
- 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.

PART 2 PRODUCTS

2.01 MATERIALS - STEEL

- A. Steel Sections: ASTM A36/A36M.
- B. Steel Tubing: ASTM A500/A500M Grade B cold-formed structural tubing.
- C. Plates: ASTM A283/A283M.
- D. Pipe: ASTM A53/A53M, Grade B Schedule 40, black finish.
- E. Stainless Steel, General: ASTM A666/A666M, Type 304.
- F. Mechanical Fasteners: Same material as or compatible with materials being fastened; type consistent with design and specified quality level.
- G. Bolts, Nuts, and Washers: ASTM A307, Grade A, plain.
- H. Bolts, Nuts, and Washers: ASTM F3125/F3125M, Type 1, plain.

- I. Welding Materials: AWS D1.1/D1.1M; type required for materials being welded.
- J. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.
- K. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20, Type I - Inorganic, complying with VOC limitations of authorities having jurisdiction.

2.02 MATERIALS - ALUMINUM

- A. Extruded Aluminum: ASTM B221 (ASTM B221M), 6063 alloy, T6 temper.
- B. Bolts, Nuts, and Washers: Steel, galvanized to ASTM A153/A153M.
- C. 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. Exposed Mechanical Fastenings: Flush countersunk screws or bolts; unobtrusively located; consistent with design of component, except where specifically noted otherwise.
- E. Furnish components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.

2.04 FABRICATED ITEMS

- A. Bollards: Steel pipe, concrete filled, crowned cap, as detailed; prime paint finish.
- B. Lintels: As detailed; prime paint finish.
- C. Door Frames for Overhead Door Openings, Wall Openings: Channel sections; prime paint finish.
- D. Recessed Mat Frames : As detailed; steel, galvanized finish.
- E. Elevator Hoistway Divider Beams: Beam sections; prime paint finish.
- F. Perforated Sheet at Railing: MOZ – Perforated 3/16" on 1/4" staggered centers – Painted to match HPC-02
- G. Toilet Partition Suspension Members: Steel channel sections; prime paint finish.
- H. METAL LADDERS
 - 1. General:
 - a. Comply with ANSI A14.3, unless otherwise indicated.
 - b. Space siderails 16 inches apart, unless otherwise indicated.

- c. Support each ladder at top and bottom and not more than 60 inches o.c. with welded or bolted brackets, made from same metal as ladder.
- 2. Steel Ladders:
 - a. Siderails: Continuous, 3/8-by-2-1/2-inch steel flat bars, with eased edges.
 - b. Rungs: #8 deformed rebar.
 - c. Fit rungs in centerline of siderails; plug-weld and grind smooth on outer rail faces.
 - d. Prime ladders, including brackets and fasteners, with zinc-rich primer.
- I. METAL GATES
 - 1. General:
 - a. Provide fully welded metal access gate and trash enclosure gates as shown on the drawings complete with metal padlock hasp, drop rods and receivers and multiple heavy-duty brass ball bearing hinges sufficient to hold the gate plumb and level.

2.05 FINISHES - STEEL

- A. Prime paint steel items.
 - 1. Exceptions: Galvanize items to be embedded in concrete, items to be embedded in masonry.
- B. Prime Painting: One coat.
- C. Galvanizing of Structural Steel Members: Galvanize after fabrication to ASTM A123/A123M requirements. Provide minimum 1.7 oz/sq ft galvanized coating. (Provide minimum 530 g/sq m galvanized coating.)
- D. Galvanizing of Non-structural Items: Galvanize after fabrication to ASTM A123/A123M requirements.

2.06 FINISHES - ALUMINUM

- A. Exterior Aluminum Surfaces: Class I color anodized.
- B. Interior Aluminum Surfaces: Class I natural anodized.
- C. Class I Natural Anodized Finish: AAMA 611 AA-M12C22A41 Clear anodic coating not less than 0.7 mils (0.018 mm) thick.

2.07 FABRICATION TOLERANCES

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

PART 3 EXECUTION

3.01 EXAMINATION

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

3.02 PREPARATION

- A. Clean and strip primed steel items to bare metal where site welding is required.
- B. 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. Obtain approval prior to site cutting or making adjustments not scheduled.

3.04 TOLERANCES

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

END OF SECTION

SECTION 055100 - 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 033000 - Cast-in-Place Concrete: Concrete fill in stair pans; mesh reinforcement for landings.
- B. Section 033000 - Cast-in-Place Concrete: Placement of metal anchors in concrete.
- C. Section 042000 - Unit Masonry: Placement of metal fabrications in masonry.
- D. Section 055000 - Metal Fabrications.
- E. Section 055213 - Pipe and Tube Railings: Metal handrails for the stairs specified in this section.
- F. Section 099113 - Exterior Painting: Paint finish.
- G. Section 099123 - Interior Painting: Paint finish.

1.03 REFERENCE STANDARDS

- A. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2019.
- B. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless; 2024.
- C. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2023.
- D. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes; 2023.
- E. ASTM A501/A501M - Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing; 2021.
- 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; 2024.
- 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 F3125/F3125M - Standard Specification for High Strength Structural Bolts and Assemblies, Steel and Alloy Steel, Heat Treated, Inch Dimensions 120 ksi, 144 ksi, and 150 ksi Minimum Tensile Strength, and Metric Dimensions 830 MPa and 1040 MPa Minimum Tensile Strength; 2025.
- I. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination; 2020.
- J. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2025, with Errata (2026).
- K. SSPC-Paint 15 - Steel Joist Shop Primer/Metal Building Primer; 2004.
- L. SSPC-SP 2 - Hand Tool Cleaning; 2024.
- M. UL 1994 - Luminous Egress Path Marking Systems; Current Edition, Including All Revisions.

1.04 SUBMITTALS

- A. See Section 013000 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories.
 - 1. Indicate welded connections using standard AWS A2.4 welding symbols. Indicate net weld lengths.
 - 2. Include the design engineer's seal and signature on each sheet of shop drawings.

1.05 QUALITY ASSURANCE

- A. Structural Designer Qualifications: Professional Structural Engineer experienced in design of this work and licensed in the State in which the Project is located, or personnel under direct supervision of such an engineer.

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. Structural Design: Provide complete stair and railing assemblies that comply with the applicable local code.
 - a. Stair Capacity: Uniform live load of 100 lb/sq ft (4.7 kPa) and a concentrated load of 300 lb (and a concentrated load of 14.4 kg) with deflection of stringer or landing framing not to exceed 1/360 of span.
 - b. Railing Assemblies: Comply with applicable local code.
 - 4. Dimensions: As indicated on drawings.

5. Shop assemble components; disassemble into largest practical sections suitable for transport and access to site.
 6. No sharp or rough areas on exposed travel surfaces and surfaces accessible to touch.
 7. Separate dissimilar metals using paint or permanent tape.
- B. Metal Jointing and Finish Quality Levels:
1. Architectural: All joints as inconspicuous as possible, whether welded or mechanical.
 - a. Welded Joints: Continuously welded and ground smooth and flush.
 - b. Mechanical Joints: Butted tight, flush, and hairline; concealed fastenings only.
 - c. Exposed Edges and Corners: Eased to small uniform radius.
 - d. Metal Surfaces to be Painted: Sanded or ground smooth, suitable for highest quality gloss finish.
- C. Fasteners: Same material or compatible with materials being fastened; type consistent with design and specified quality level.
- D. Anchors and Related Components: Same material and finish as item to be anchored, except where specifically indicated otherwise; provide all anchors and fasteners required.

2.02 METAL STAIRS WITH CONCRETE TREADS

- A. Jointing and Finish Quality Level: Architectural, as defined above.
- B. Risers: Closed.
- C. Treads: Metal pan with field-installed concrete fill.
1. Concrete Depth: 1-1/2 inches (38 mm), minimum.
 2. Tread Pan Material: Steel sheet.
 3. Tread Pan Thickness: As required by design; 14 gauge, 0.075 inch (1.9 mm) minimum.
 4. Pan Anchorage to Stringers: Welded or bolted to carrier angles welded or bolted to stringers.
 5. Concrete Reinforcement: Welded wire mesh.
 6. Concrete Finish: Steel troweled.
- D. Risers: Same material and thickness as tread pans.
1. Nosing Depth: Not more than 1-1/2 inch (38 mm) overhang.
 2. Nosing Return: Flush with top of concrete fill, not more than 1/2 inch (12 mm) wide.
- E. Stringers: Rolled steel channels.
1. Stringer Depth: 12 inches (305 mm).
 2. End Closure: Sheet steel of same thickness as risers welded across ends.
- F. Landings: Same construction as treads, supported and reinforced as required to achieve design load capacity.
- G. Railings: See plans.
- H. Finish: Shop- or factory-prime painted.
- I. Under Side of Stair: Exposed to view, to be finished same as specified for other exposed to view surfaces.

2.03 HANDRAILS AND GUARDS

- A. See Spec section 055213 Pipe and Tube Railings for information along with A7.X of the architectural drawings.

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. Ungalvanized Steel Sheet: Hot- or cold-rolled, except use cold-rolled where finished work will be exposed to view.
 - 1. Hot-Rolled Steel Sheet: ASTM A1011/A1011M, Designation CS (commercial steel).
 - 2. Cold-Rolled Steel Sheet: ASTM A1008/A1008M, Designation CS (commercial steel).
- E. Concrete Fill: See Section 033000.
- F. Concrete Reinforcement: Mesh type as detailed, galvanized.

2.05 ACCESSORIES

- A. Photoluminescent Nosing: Factory fabricated aluminum extrusion with replaceable embedded photoluminescent and slip-resistant strip, complies with UL 1994.
 - 1. Finish: Manufacturer's standard clear anodized.
 - 2. Color: To be selected by Architect from manufacturer's standard range.
 - 3. Attachment: Cast into concrete.
 - 4. Manufacturers:
 - a. Safe-T-Nose, LLC; STNR: www.safetnose.com/#sle.
 - b. Substitutions: See Section 016000 - Product Requirements.
- B. Steel Bolts, Nuts, and Washers: ASTM F3125/F3125M, Type 1, and galvanized to ASTM A153/A153M where connecting galvanized components.
- C. Welding Materials: AWS D1.1/D1.1M; type required for materials being welded.
- D. 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.

PART 3 EXECUTION

3.01 EXAMINATION

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

3.02 PREPARATION

- A. When field welding is required, clean and strip primed steel items to bare metal.
- B. Supply items required to be cast into concrete and embedded in masonry with setting templates.

3.03 INSTALLATION

- A. Install components plumb and level, accurately fitted, free from distortion or defects.
- B. Provide anchors, plates, angles, hangers, and struts required for connecting stairs to structure.
- C. Allow for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.
- D. Provide welded field joints where specifically indicated on drawings. Perform field welding in accordance with AWS D1.1/D1.1M.
- E. Other field joints may be either welded or bolted provided the result complies with the limitations specified for jointing quality levels.
- F. Obtain approval prior to site cutting or creating adjustments not scheduled.
- G. After erection, prime welds, abrasions, and surfaces not shop primed or galvanized, except surfaces to be in contact with concrete.

3.04 TOLERANCES

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

END OF SECTION

SECTION 055213 - PIPE AND TUBE RAILINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Wall mounted handrails.
- B. Stair railings and guardrails.

1.02 RELATED REQUIREMENTS

- A. Section 033000 - Cast-in-Place Concrete: Placement of anchors in concrete.
- B. Section 042000 - Unit Masonry: Placement of anchors in masonry.
- C. Section 055100 - Metal Stairs: Handrails other than those specified in this section.
- D. Section 099123 - Interior Painting: Paint finish.

1.03 REFERENCE STANDARDS

- A. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.
- B. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless; 2024.
- C. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes; 2023.
- D. ASTM E935 - Standard Test Methods for Performance of Permanent Metal Railing Systems and Rails for Buildings; 2021.
- E. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination; 2020.
- F. SSPC-Paint 15 - Steel Joist Shop Primer/Metal Building Primer; 2004.

1.04 SUBMITTALS

- A. See Section 013000 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Indicate profiles, sizes, connection attachments, anchorage, size and type of fasteners, and accessories.
 - 1. Indicate welded connections using standard AWS A2.4 welding symbols. Indicate net weld lengths.

1.05 QUALITY ASSURANCE

- A. Structural Designer Qualifications: Professional Structural Engineer experienced in design of this work and licensed in the State in which the Project is located, or personnel under direct supervision of such an engineer.

- B. Welder Qualifications: Welding processes and welding operators qualified within previous 12 months.
- C. Fabricator Qualifications:
 - 1. A company specializing in manufacturing products specified in this section, with not less than five years of documented experience.

PART 2 PRODUCTS

2.01 RAILINGS - GENERAL REQUIREMENTS

- A. Design, fabricate, and test railing assemblies in accordance with the most stringent requirements of applicable local code.
- B. Distributed Loads: Design railing assembly, wall rails, and attachments to resist distributed force of 75 pounds per linear foot (1095 N/m) applied to the top of the assembly and in any direction, without damage or permanent set. Test in accordance with ASTM E935
- C. Concentrated Loads: Design railing assembly, wall rails, and attachments to resist a concentrated force of 200 pounds (890 N) applied at any point on the top of the assembly and in any direction, without damage or permanent set. Test in accordance with ASTM E935
- D. Allow for expansion and contraction of members and building movement without damage to connections or members.
- E. Dimensions: See drawings for configurations and heights.
 - 1. Top Rails: 2 ½" x 1 ½" Hardwood rail cap on steel member per drawings.
 - 2. Wall Handrails: 1 ½" diameter, round stainless steel.
 - 3. Intermediate Rails: 2x2x1/8 HSS Tube Steel
 - 4. Posts: 4"x2"x1/8" Tube
 - 5. Infill: 2"x 3/8" Steel Bar Pickets @ 3 ¾" O.C. or Perforated 1/8" Metal Sheet
- F. Provide anchors and other components as required to attach to structure, made of same materials as railing components unless otherwise indicated; where exposed fasteners are unavoidable provide flush countersunk fasteners.
 - 1. For anchorage to concrete, provide inserts to be cast into concrete, for bolting anchors.
 - 2. For anchorage to masonry, provide brackets to be embedded in masonry, for bolting anchors.
- G. Provide welding fittings to join lengths, seal open ends, and conceal exposed mounting bolts and nuts, including but not limited to elbows, T-shapes, splice connectors, flanges, escutcheons, and wall brackets.

2.02 STEEL RAILING SYSTEM

- A. Steel Tube: ASTM A500/A500M Grade B cold-formed structural tubing.
- B. Steel Pipe: ASTM A53/A53M Grade B Schedule 80, black finish.
- C. Handrail Pipe: Stainless steel finish.

- D. Welding Fittings: Factory- or shop-welded from matching pipe or tube; seams continuously welded; joints and seams ground smooth.
- E. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.

2.03 FABRICATION

- A. Accurately form components to suit specific project conditions and for proper connection to building structure.
- B. Fit and shop assemble components in largest practical sizes for delivery to site.
- C. Fabricate components with joints tightly fitted and secured. Provide spigots and sleeves to accommodate site assembly and installation.
- D. Welded Joints:
 - 1. Exterior Components: Continuously seal joined pieces by intermittent welds and plastic filler. Drill condensate drainage holes at bottom of members at locations that will not encourage water intrusion.
 - 2. Interior Components: Continuously seal joined pieces by intermittent welds and plastic filler.
 - 3. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.

2.04 STEEL AND IRON FINISHES

- A. Primed Railings:
 - 1. Prime steel and iron railings, including hardware, after fabrication with manufactures standard primer.
- B. Stainless Steel Handrails:
 - 1. Stainless steel round pipe railing shall meet the requirements of ASTM A240, Stainless Steel Type 304 with #8 polished finish.
- C. For galvanized railings, provide hot-dip galvanized fittings, brackets, fasteners, sleeves, and other ferrous components.
- D. For nongalvanized steel railings, provide nongalvanized ferrous-metal fittings, brackets, fasteners, and sleeves, except galvanize anchors to be embedded in exterior concrete or masonry.
- E. Apply shop primer to prepared surfaces of railings, unless otherwise indicated. Comply with requirements in SSPC-PA 1, "Paint Application Specification No. 1: Shop, Field, and Maintenance Painting of Steel," for shop painting. Primer need not be applied to surfaces to be embedded in concrete or masonry.
 - 1. Do not apply primer to galvanized surfaces.
 - 2. Stripe paint corners, crevices, bolts, welds, and sharp edges.

- F. For stainless steel railings, provide stainless steel fittings, brackets, fasteners, etc. Stainless steel bars and plates shall meet the requirements of ASTM A276, Type 304. Set screws, anchor bolts, brackets, flanges and other fasteners to be fabricated from Type 304 stainless steel.

PART 3 EXECUTION

3.01 EXAMINATION

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

3.02 PREPARATION

- A. Supply items required to be cast into concrete or embedded in masonry with setting templates, for installation as work of other sections.

3.03 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install components plumb and level, accurately fitted, free from distortion or defects, with tight joints.
- C. Install railings in compliance with ADA Standards for accessible design at applicable locations.
- D. Anchor railings securely to structure.
- E. Conceal anchor bolts and screws whenever possible. Where not concealed, use flush countersunk fastenings.

3.04 TOLERANCES

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

END OF SECTION

SECTION 061053 - MISCELLANEOUS ROUGH CARPENTRY

PART 1 GENERAL

1.01 Sections Includes

- A. Preservative-treated wood materials.
- B. Fire-retardant-treated wood materials.
- C. Wood in contact with membrane roofing.
- D. Wood in contact with membrane waterproofing.
- E. Concealed wood blocking, nailers, and supports.

1.02 Related Requirements

- A. Section 076200 - Sheet Metal Flashing and Trim.

1.03 Reference Standards

- A. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2023.
- B. ASTM B695 - Standard Specification for Coatings of Zinc Mechanically Deposited on Iron and Steel; 2021.
- C. ASTM D2898 - Standard Practice for Accelerated Weathering of Fire-Retardant-Treated Wood for Fire Testing; 2010 (Reapproved 2024).
- D. AWP A M4 - Standard for the Handling, Storage, Field Fabrication and Field Treatment of Preservative-Treated Wood Products; 2023.
- E. AWP A U1 - Use Category System: User Specification for Treated Wood; 2025.
- F. ICC (IBC) - International Building Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- G. ITS (DIR) - Directory of Listed Products; Current Edition.
- H. PS 20 - American Softwood Lumber Standard; 2025.
- I. UL (DIR) - Online Certifications Directory; Current Edition.

1.04 Submittals

- A. See Section 013000 - Administrative Requirements for submittal procedures.
- B. Product Data:
 - 1. Fire-retardant treatment.
 - 2. Pressure-preservative treatment.
 - 3. Field-applied preservative treatment product data and application instructions.

1.05 Delivery, Storage, and Handling

- A. Cover wood products to protect against moisture. Support stacked products to prevent deformation and allow air circulation.
- B. Fire-Retardant Treated Wood: Prevent exposure to precipitation during shipping, storage, and installation.

PART 2 PRODUCTS

2.01 General Requirements

- A. Dimension Lumber: Comply with PS 20 and requirements of specified grading agencies.
 - 1. Grading Agency: Grading agency whose rules are approved by the Board of Review, American Lumber Standard Committee (www.alsc.org), and that provides grading service for species and grade specified. Provide lumber stamped with grade mark unless otherwise indicated.

2.02 Dimension Lumber

- A. Sizes: Nominal sizes as indicated on drawings, S4S.
- B. Moisture Content: S-dry or MC19.
- C. Miscellaneous Framing, Blocking, Nailers, Grounds, and Furring:
 - 1. Lumber: S4S, No.2 or Standard Grade.
 - 2. Boards: Standard or No.3.
- D. Parapet Caps: 1-1/2 inch (38 mm) thick, laminated strand lumber.

2.03 Fire-Retardant Treatment (FRT)

- A. Factory-treat wood members in accordance with AWPA U1 and use category indicated.
- B. Fire-Retardant Treatment: Interior Type A, Use Category UCFA (HT), High Temperature.
 - 1. Treat blocking and other wood members concealed in noncombustible construction.
 - 2. Treat electrical and communications panel backer boards.
 - 3. Treat wood in locations indicated on drawings.
- C. Fire-Retardant Treatment: Exterior Type B, Use Category UCFB.
 - 1. Treat Blocking & Nailers.
 - 2. Treat wood in locations indicated on drawings.
- D. Kiln-dry after treatment (KDAT) to maximum moisture content of 19 percent for sawn material and 15 percent for plywood.
- E. Fabrication of FRT Wood:
 - 1. Ripping or milling of boards, lumber, and timber after treatment is not permitted.
 - 2. Field cutting to length and drilling of holes in boards, lumber, and timber are permitted without additional treatment.
 - 3. Field cutting and drilling of holes in plywood are permitted.

- F. Label or brand FRT wood with classification mark of UL (DIR) or ITS (DIR) or other approved inspection agency, the treatment plant, name of treatment, species of wood, flame spread and smoke-developed indexes, method of drying after treatment, and treating standard.
 - 1. In addition, Exterior Type B labeling shall include the words: NO INCREASE IN THE LISTED CLASSIFICATION WHEN SUBJECTED TO THE STANDARD RAIN TEST (ASTM D2898).

2.04 Pressure-Preservative Treatment (PPT)

- A. Factory-treat wood members in accordance with AWP A U1 and use category indicated.
- B. Applications - Treat the Following:
 - 1. Lumber and plywood in contact with membrane roofing and flashing: Use Category UC3B, above ground, exterior.
 - 2. Lumber and plywood in contact with waterproofing and flashing: Use Category UC4A, ground contact.
- C. Kiln-dry wood after treatment with waterborne preservative to maximum moisture content of 19 percent for lumber and 15 percent for plywood.
- D. Perform fabrication such as cutting, boring, milling, and surfacing to maximum extent practicable before treatment.
- E. Label preservative-treated wood with marking as required by AWP A U1 and ICC (IBC). Unless otherwise permitted by standard U1 and the building code, marking shall include the phrase: AWP A U1, accredited inspection agency's mark, and shall identify treating plant, type of preservative, retention, and end use.
- F. Field Treatment for Cuts and Holes in Preservative-Treated Wood: Comply with AWP A M4.

2.05 Accessories

- A. Metal and Finish of Fasteners:
 - 1. Fire-Retardant-Treated Wood:
 - a. Nails, timber rivets, wood screws, and lag screws: Hot-dip galvanized steel complying with ASTM A153/A153M Class D.
 - 2. Preservative-Treated Wood:
 - a. Nails, timber rivets, wood screws, and lag screws - general use: Hot-dip galvanized steel complying with ASTM A153/A153M Class D.
 - b. Fasteners other than staples, nails, timber rivets, wood screws, and lag screws: Mechanically deposited zinc-coated steel, ASTM B695 Class 55 or better.
 - 3. Untreated Wood: Unfinished steel.

PART 3 EXECUTION

3.01 Installation - General

- A. Select material sizes to minimize waste.

- B. Reuse scrap to greatest extent possible; clearly separate scrap for use on-site as accessory components, including shims, bracing, and blocking.

3.02 Blocking, Nailers, and Supports

- A. Provide framing and blocking members as indicated or as required to support finishes, fixtures, specialty items, and trim.

3.03 Site-Applied Wood Treatment

- A. Apply preservative treatment to field-cut surfaces in accordance with manufacturer's instructions wherever cuts, holes, sawing, or other fabrication of wood members is required after pressure-preservative treatment.
- B. Apply preservative treatment in accordance with manufacturer's instructions.
- C. Allow preservative to dry prior to erecting members.

END OF SECTION

SECTION 061600 - SHEATHING

PART 1 GENERAL

1.01 Section Includes

- A. Sheathing.

1.02 REFERENCE STANDARDS

- A. ASTM C1177/C1177M - Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing; 2024.
- B. ASTM C1185 - Standard Test Methods for Sampling and Testing Fiber-Cement Flat Sheet, Roofing and Siding Shingles, and Clapboards; 2023.
- C. ASTM D1037 - Standard Test Methods for Evaluating Properties of Wood-Base Fiber and Particle Panel Materials; 2012 (Reapproved 2020).
- D. ASTM D1293 - Standard Test Methods for pH of Water; 2018.
- E. ASTM D3273 - Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber; 2021.
- F. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2024.
- G. ASTM E96/E96M - Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials; 2024a.
- H. ASTM E136 - Standard Test Method for Assessing Combustibility of Materials Using a Vertical Tube Furnace at 750 Degrees C; 2024c.
- I. ASTM E2178 - Standard Test Method for Determining Air Leakage Rate and Calculation of Air Permeance of Building Materials; 2021a.
- J. ASTM E2357 - Standard Test Method for Determining Air Leakage Rate of Air Barrier Assemblies; 2024.

1.03 Submittals

- A. See Section 013000 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide technical data on sheathing, wood preservative materials, and application instructions.

1.04 Quality Assurance

- A. Use materials evaluated by Air Barrier Association of America (ABAA).

- B. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with minimum three years of documented experience.

1.05 Delivery, Storage, and Handling

- A. See Section 017419 - Construction Waste Management and Disposal for packaging waste requirements.
- B. Store products above ground in dry ventilated space to protect against moisture. Support stacked products to prevent deformation and allow air circulation.
- C. Store panels over stable soil capable of carrying load of pallets.

1.06 Field Conditions

- A. When mechanically fastened, do not install cementitious reinforced panel when ambient or conditioned temperature is below 0 degrees F (minus 18.6 degrees C).

PART 2 PRODUCTS

2.01 Manufacturers

- A. USG Corporation: www.usg.com/#sle.
- B. Substitutions: See Section 016000 - Product Requirements.

2.02 Sheathing

- A. Soffit Sheathing: Wood structural panels with noncombustible overlayment or coating factory-bonded to interior face of plywood panels.
 - 1. Overlayment Noncombustibility Testing: Comply with ICC (IBC) testing requirements.
 - 2. 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 or UL 723.
 - 3. Plywood Panels:
 - a. Comply with PS 1 or PS 2.
 - b. Performance Category and Span Rating: 19/32 PERF CAT and 40/20 span rating.
 - c. Bond Classification: Exterior.
 - d. Grade: Structural 1 C-D.
 - e. Sizes: 48 by 96 inches (1220 by 2440 mm).
 - f. Edges: Square.
- B. Glass-mat-faced gypsum wall sheathing with integral water-resistive and air barrier, comply with ASTM C1177/C1177M.
 - 1. Size: 48 by 96 inches (1220 by 2440 mm), nominal.
 - 2. Thickness: 5/8 inch
 - 3. Edges: Square.
 - 4. Water Vapor Permeance: 1 perm (57.5 ng/(Pa s sq m)), minimum, when tested in accordance with ASTM E96/E96M.

5. Air Permeance, Sheathing: 0.001 cfm/sq ft (0.005 L/sec/sq m), maximum, when tested in accordance with ASTM E2178.
6. Air Permeance, Assembly: 0.04 cfm/sq ft (0.2 L/sec/sq m), maximum, when tested in accordance with ASTM E2357.
7. Products:
 - a. USG Corporation; Securock ExoAir 430 Panel.

PART 3 EXECUTION

3.01 Preparation

- A. Coordinate installation of roof and floor deck construction, framing of openings, and other assembly installation.
- B. Coordinate installation of rough carpentry members specified in other sections.

3.02 Installation

- A. Select material sizes to minimize waste.
- B. Reuse and clearly separate scrap for use on-site as accessory components, including shims, bracing, and blocking.
- C. Roof Sheathing: Secure panels with long dimension perpendicular to framing members, with ends staggered and over firm bearing.
- D. Wall Sheathing: Secure with long dimension perpendicular to wall studs, with ends over firm bearing and staggered, using screws.
- E. Wall Sheathing with Integrated Water-Resistive Barrier and Air Barrier: Secure to studs in accordance with manufacturer's installation instructions.
 1. Install with water-resistive and air barrier on exterior side of sheathing.
 2. Do not bridge building expansion joints; cut and space edges of panels to match spacing of structural support elements.
 3. Do not install directly over masonry surfaces; use furring strips or framing.
 4. Apply manufacturer's standard seam sealants and transition membranes.

3.03 Tolerances

- A. Surface Flatness of Floor: 1/8 inch (1 mm) in 10 feet (3 m), maximum, and 1/4 inch (7 mm) in 30 feet (9.1 m), maximum.
- B. Variation from Plane; Surfaces Other Than Floors: 1/4 inch (2 mm) in 10 feet (3 m), maximum, and 1/4 inch (7 mm) in 30 feet (9.1 m), maximum.

3.04 Cleaning

- A. Waste Disposal: See Section 017419 - Construction Waste Management and Disposal.
 1. Comply with applicable regulations.

2. Do not burn scrap on project site.
 3. Do not burn pressure treated scraps.
- B. Clean material debris, shavings, and sawdust prior to Substantial Completion of project.

END OF SECTION

SECTION 062000 - FINISH CARPENTRY

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Finish carpentry items.
- B. Shop finishing.

1.02 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.

1.03 SUBMITTALS

- A. See Section 013000 - Administrative Requirements for submittal procedures.
- B. Product Data:
 - 1. Provide manufacturer's product data, storage and handling instructions for factory-fabricated units.
- C. 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).
- D. Samples: Submit two samples of finish wood, size illustrating wood grain and specified finish.

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. WD-01 – Custom Milwork – Hardwood Lumber – White Oak, Clear Satin, Non-Combustible – 1x12" Tongue & Groove – See plans for locations
 - 2. WD-02 – Interior Trim - Hardwood Lumber – White Oak, Clear Satin, Non-Combustible – 1 ½" Thick – See plans for locations

2.02 LUMBER MATERIALS

- A. Hardwood Lumber: White Oak, Maple species, Rift Cut sawn, maximum moisture content of 6 percent ; with vertical grain , of quality suitable for transparent finish.

2.03 FASTENINGS

- A. Adhesive for Purposes Other Than Laminate Installation: Suitable for the purpose; not containing formaldehyde or other volatile organic compounds.

2.04 ACCESSORIES

- A. Adhesive: Type recommended by fabricator to suit application.
- B. Wood Filler: Solvent base, tinted to match surface finish color.

2.05 FABRICATION

- A. Shop assemble work for delivery to site, permitting passage through building openings.
- B. When necessary to cut and fit on site, provide materials with ample allowance for cutting. Provide trim for scribing and site cutting.

2.06 SHOP FINISHING

- A. Sand work smooth and set exposed nails and screws.
- B. Apply wood filler in exposed nail and screw indentations.
- C. On items to receive transparent finishes, use wood filler that matches surrounding surfaces and is of type recommended for the applicable finish.
- D. 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 - System - 11, catalyzed polyurethane.
 - 1) Sheen: Satin.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify adequacy of backing and support framing.

3.02 INSTALLATION

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

3.03 Site-Applied Wood Treatment

- A. Apply preservative treatment in accordance with manufacturer's instructions.
- B. Allow preservative to dry prior to erecting members.

3.04 PREPARATION FOR SITE FINISHING

- A. Set exposed fasteners. Apply wood filler in exposed fastener indentations. Sand work smooth.

3.05 TOLERANCES

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

END OF SECTION

SECTION 064200 - WOOD PANELING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Custom wood veneer paneling.
- B. Shop finishing.

1.02 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. HPVA HP-1 - American National Standard for Hardwood and Decorative Plywood; 2024.

1.03 SUBMITTALS

- A. See Section 013000 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide data on fire-retardant treatment materials and application instructions.
- C. Samples: Submit two samples of finished plywood, in size, illustrating wood grain and specified finish.
- D. Samples: Submit two samples of wood trim..

1.04 QUALITY ASSURANCE

- A. Fabricator Qualifications: Company specializing in fabricating the products specified in this section with minimum five years of documented experience.
 - 1. Company with at least one project in the past 5 years with value of woodwork within 20 percent of cost of woodwork for this Project.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Protect work from moisture damage.
- B. Do not deliver wood materials to project site until building is fully enclosed and interior temperature and humidity are in accordance with recommendations of AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS).

PART 2 PRODUCTS

2.01 REGULATORY REQUIREMENTS

- A. Comply with applicable codes for fire-retardant requirements.

2.02 PANELING

- A. Quality Standard: Custom Grade, in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), unless otherwise indicated.
- B. Basis of Design: Rulon International
 - 1. WDWP-01 – Rulon International – Flat Wall Panel
 - 2. WDWP-02 – Rulon International – Linear Open
 - 3. WDWP-03 – Rulon International – Wall Panel Beam
 - 4. Alternative Manufacturers
 - a. 9 Wood
 - b. Armstrong
 - c. USG
- C. White & Red Oak – Clear Satin Finish – See Plan for more information.
- D. Assemble panels by gluing and concealed fastening.

2.03 WOOD-BASED MATERIALS - GENERAL

- A. Hardwood Plywood: HPVA HP-1 Grade A; veneer core, type of glue recommended for application; of grain quality suitable for transparent finish.
- B. Lumber: Maximum moisture content of 6 percent; with vertical grain , of quality suitable for transparent finish.

2.04 ADHESIVES AND FASTENERS

- A. Adhesives: Type suitable for intended purpose, complying with applicable air quality regulations.

2.05 FABRICATION

- A. Prepare panels for delivery to site, permitting passage through building openings.
- B. Finish exposed edges of panels as specified by grade requirements.

2.06 SHOP FINISHING

- A. Sand work smooth and set exposed nails and screws.
- B. Apply wood filler in exposed nail and screw indentations.

- C. On items to receive transparent finishes, use wood filler that matches surrounding surfaces and is of type recommended for the applicable finish.
- D. Finish work in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), Section 5 - Finishing for grade specified and as follows:
 - 1. Transparent:
 - 2. Grade: Premium.
 - 3. Finish: System - 11, catalyzed polyurethane.
 - 4. Staining: Match Architect's sample.
 - 5. Filled Finish for Open-Grain Woods: After staining, apply wash-coat sealer and allow to dry. Apply paste wood filler and wipe off excess. Tint filler to match stained wood.
 - 6. Sheen: Satin, 31-45gloss units measured on 60-degree gloss meter per ASTM D 523.

2.07 ACCESSORIES

- A. Metal Trim:
 - 1. Material: Extruded aluminum.
- B. Wood Filler: Tinted to match surface finish color.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that field measurements are as indicated on shop drawings.

3.02 INSTALLATION

- A. Install work in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS) requirements for grade indicated.
- B. Do not begin installation until wood materials have been fully acclimated to interior conditions.
- C. Set and secure materials and components in place, plumb and level, using concealed fasteners wherever possible.
- D. Where necessary to cut and fit on site, scribe work abutting other components. Do not use additional overlay trim to conceal gaps.

3.03 SITE-APPLIED WOOD TREATMENT

- A. Apply preservative treatment in accordance with manufacturer's instructions.

3.04 PREPARATION FOR FIELD FINISHING

- A. Set exposed fasteners. Apply wood filler in exposed fastener indentations. Sand work smooth.

3.05 TOLERANCES

- A. Maximum Variation from True Position: 1/16 inch (1.6 mm).
- B. Maximum Offset from True Alignment with Abutting Materials: 1/32 inch (0.8 mm).

END OF SECTION

SECTION 066400 - PLASTIC PANELING

PART 1 GENERAL

1.01 Section Includes

- A. Plastic liner panel assemblies.

1.02 Related Requirements

- A. Section 079200 - Joint Sealants.
- B. Section 092216 - Non-Structural Metal Framing.

1.03 Reference Standards

- A. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2018 (Reapproved 2024).
- B. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2024.
- C. ASTM F593 - Standard Specification for Stainless Steel Bolts, Hex Cap Screws, and Studs; 2024.
- D. NSF 51 - Food Equipment Materials; 2023.

1.04 Submittals

- A. See Section 013000 - Administrative Requirements for submittal procedures.
- B. Product Data: For each panel and trim type.
- C. Shop Drawings:
 - 1. For each wall paneling layout, indicate:
 - a. Elevations: Dimensioned locations of panels and penetrations. Include field measurements indicating extents of paneling.
 - 2. Details: Include panel-to-trim connections.
- D. Samples: For each wall panel type, two samples, 6 inches by 6 inches (150 mm by 150 mm) in size, indicating specified color and texture.
- E. Samples: For each trim type, two samples, 4 inches (101 mm) in length, indicating specified color and texture.
- F. Installer's qualification statement.
- G. Maintenance Materials: Furnish the following for Owner's use in maintenance of project:
 - 1. See Section 016000 - Product Requirements for additional provisions.
 - 2. Extra Stock Materials: Two of each type of liner panel.

1.05 Quality Assurance

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

1.06 Delivery, Storage, and Handling

- A. See Section 017419 - Construction Waste Management and Disposal for packaging waste requirements.
- B. Deliver products to site in manufacturer's original, unopened packaging, with labels clearly identifying product name and manufacturer.
- C. Store products in clean, dry, interior areas in accordance with manufacturer's instructions.
- D. Store plastic panels and trim flat.

1.07 Field Conditions

- A. Ambient Field-Cutting Conditions: Before field-cutting panels in temperatures below 40 degrees F (4.4 degrees C), warm space to 60 degrees F (16 degrees C) minimum. Maintain temperature for 24 hours before, during, and after field-cutting.
- B. Ambient Conditions for Installation: When ambient temperatures are below 40 degrees F (4.4 degrees C), warm space to 60 degrees F (16 degrees C) minimum. Maintain temperature for 24 hours before, during, and after installation.

1.08 Warranty

- A. See Section 017800 - Closeout Submittals for additional warranty requirements.
- B. Manufacturer Warranty: Provide 10-year manufacturer warranty for products free from manufacturing defects. Complete forms in Owner's name and register with manufacturer.

PART 2 PRODUCTS

2.01 Manufacturers

- A. Plastic Paneling:
 - 1. Marlite
 - 2. Inpro-Palladium Rigid Sheet: Basis of Design
 - a. Pearl White – 5M010 (Standard Smooth Surface)
 - b. Size: 4'x10' - Vertically
 - 3. Panolam

2.02 PLASTIC PANELING

- A. Material: Rigid Vinyl sheet shall be manufactured from chemical and stain resistant unplasticized polyvinyl chloride (uPVC) with the addition of impact modifiers. No plasticizers shall be added (plasticizers may aid in bacterial growth).

2.03 Accessories

- A. Stainless steel top caps shall be made of #400 series stainless steel.
- B. Stainless steel vertical divider bars shall be #400 series stainless steel on galvanized steel.
- C. Adhesives: Type recommended by panel manufacturer for application; not containing formaldehyde or volatile organic compounds.
- D. Joint Sealants: Clear silicone; ASTM C920, Type S, Grade NS, Class 50, Uses NT and G.
 - 1. Food Contact Grade: Approved for food contact in accordance with NSF 51.

PART 3 EXECUTION

3.01 Examination

- A. Verify field measurements are as indicated on shop drawings.
- B. Verify substrates are prepared to receive plastic paneling.
- C. If substrate preparation is responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
- D. Verify mechanical, electrical, and other building components affecting work of this section are placed and ready to receive work of this section.

3.02 Preparation

- A. Surface Preparation: Clean substrate surfaces prior to installing paneling.

3.03 Installation - General

- A. Maintain manufacturer recommended gap tolerances between panels and adjacent abutments.
- B. Field-cut panels in accordance with manufacturer's written instructions. Make straight and square cuts; do not damage panels.

3.04 Installation - Plastic Wall Liner Panels

- A. Vertically Installed Liner Panel: Install panels plumb within specified tolerances.
- B. Horizontally Installed Liner Panels: Install panels level within specified tolerances.

- C. Adhesive Attachment to Masonry Walls: Apply adhesive in accordance with panel manufacturer's written instructions.

3.05 Installation - Plastic Panel Walls

- A. Install panels and trim in accordance with manufacturer's written instructions.
- B. Install panel layout as indicated on approved shop drawings.
- C. Install wall panels plumb within specified tolerances.
- D. Install sealant to prevent water intrusion in accordance manufacturer's written instructions.

3.06 Tolerances

- A. Maximum Variation from True Position: 1/4 inch (6.4 mm).
- B. Maximum Variation from Plumb: 1/4 inch in 10 feet (2 mm in 1 m).
- C. Maximum Variation from Level: 1/4 inch in 10 feet (2 mm in 1 m).

3.07 Protection

- A. Protect installed plastic paneling from subsequent construction operations.

END OF SECTION

SECTION 071300 - SHEET WATERPROOFING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Modified bituminous sheet membrane.

1.02 RELATED REQUIREMENTS

- A. Section 033000 - Cast-in-Place Concrete: Concrete substrate.
- B. Section 072100 - Thermal Insulation: Insulation used for protective cover.

1.03 REFERENCE STANDARDS

- A. NRCA (WM) - The NRCA Waterproofing Manual; 2021.

1.04 SUBMITTALS

- A. See Section 013000 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide data for membrane.
- C. Certificate: Certify that products meet or exceed specified requirements.
- D. Manufacturer's Installation Instructions: Indicate special procedures.
- E. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years of documented experience.

1.06 FIELD CONDITIONS

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

1.07 WARRANTY

- A. See Section 017800 - Closeout Submittals for additional warranty requirements.

PART 2 PRODUCTS

2.01 SHEET WATERPROOFING APPLICATIONS

- A. Modified Bituminous Sheet Membrane:
 - 1. Location: Exterior Face of Foundation Walls.
 - 2. Vertical Surfaces: Adhesive bonded to substrate.
 - 3. Cover with drainage panel.

2.02 SHEET WATERPROOFING MATERIALS

- A. Modified Bituminous Sheet Membrane: Asphalt and polymer modifiers of SBS type, reinforced with nonwoven glass fibers; smooth surfaced.
 - 1. Formulated for seaming by heat welding.
 - 2. Thickness: 100 mil, 0.10 inch (2.5 mm), minimum.
 - 3. Sheet Width: 19-11/16 inches (0.5 m), minimum.
 - 4. Products:
 - a. Soprema, Inc; COLPHENE 3000: www.soprema.us/#sle.
 - b. Substitutions: See Section 016000 - Product Requirements.

2.03 ACCESSORIES

- A. Attachment Materials:
- B. Sealant for Cracks and Joints In Substrates: Resilient elastomeric joint sealant compatible with substrates and waterproofing materials.
- C. Drainage Panel: Drainage layer with geotextile filter fabric on earth side.
 - 1. Composition: Dimpled polystyrene, polyethylene, or polypropylene core; polypropylene filter fabric.
 - 2. Thickness: 1/4 inch (6.4 mm).
 - 3. Products:
 - a. Advanced Building Products, Inc; ABP AdvancedDrain Polymeric Drainage Mat: www.advancedbuildingproducts.com/#sle.
 - b. AVM Industries, Inc; Drain Board 9000/9020/9080: www.avmindustries.com/#sle.
 - c. EPRO Services, Inc: www.eproinc.com/#sle.
 - d. Freudenberg Performance Materials; EnkaDrain: www.freudenberg-pm.com/#sle.
 - e. Mar-flex Waterproofing & Building Products: www.mar-flex.com/#sle.
 - f. Sika Corporation; Drainage Mat: www.usa.sika.com/#sle.
 - g. W. R. Meadows, Inc; Mel-Drain 5012: www.wrmeadows.com/#sle.
 - h. Substitutions: See Section 016000 - Product Requirements.
- D. Adhesives: As recommended by membrane manufacturer.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify existing conditions are acceptable prior to starting work.
- B. Verify substrate surfaces are durable; free of matter detrimental to adhesion or application of waterproofing system.
- C. Verify that items penetrating surfaces to receive waterproofing are securely installed.
- D. Do not proceed with work until unsatisfactory conditions have been corrected.

3.02 PREPARATION

- A. Protect adjacent surfaces from damage not designated to receive waterproofing.
- B. Clean and prepare surfaces to receive waterproofing in accordance with manufacturer's instructions; vacuum substrate clean.
- C. Fill nonmoving joints and cracks with a filler compatible with waterproofing materials.
- D. Seal moving cracks with sealant and nonrigid filler, using procedures recommended by sealant and waterproofing manufacturers.

3.03 INSTALLATION - MEMBRANE

- A. Install membrane waterproofing in accordance with manufacturer's instructions and NRCA (WM) applicable requirements.
- B. Roll out membrane, and minimize wrinkles and bubbles.
- C. Overlap edges and ends, minimum 3 inches (76 mm), seal permanently waterproof by method recommended by manufacturer, and apply uniform bead of sealant to joint edge.
- D. Reinforce membrane with multiple thickness of membrane material over joints, whether joints are static or dynamic.
- E. Weather lap joints on sloped substrate in direction of drainage, and seal joints and seams.
- F. Flexible Flashings: Seal items watertight that penetrate through waterproofing membrane with flexible flashings.
- G. Seal membrane and flashings to adjoining surfaces.

3.04 FIELD QUALITY CONTROL

- A. See Section 014000 - Quality Requirements for additional requirements.

END OF SECTION

SECTION 071900 - WATER REPELLENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Water repellents applied to exterior and interior, masonry, stone, and concrete surfaces.

1.02 REFERENCE STANDARDS

- A. ASTM C140/C140M - Standard Test Methods for Sampling and Testing Concrete Masonry Units and Related Units; 2025.
- B. ASTM C642 - Standard Test Method for Density, Absorption, and Voids in Hardened Concrete; 2021.

1.03 SUBMITTALS

- A. See Section 013000 - Administrative Requirements for submittal procedures.
- B. Manufacturer's Installation Instructions: Indicate special procedures and conditions requiring special attention; cautionary procedures required during application.
- C. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- D. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
 - 1. See Section 016000 - Product Requirements for additional provisions.

1.04 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years documented experience.

1.05 FIELD CONDITIONS

- A. Protect liquid materials from freezing.
- B. Do not apply water repellent when ambient temperature is lower than 50 degrees F (10 degrees C) or higher than 100 degrees F (38 degrees C).

1.06 WARRANTY

- A. See Section 017800 - Closeout Submittals for additional warranty requirements.
- B. Provide five year manufacturer warranty..
 - 1. Include coverage for degradation of waterproofing ability, reduction in graffiti resistance.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Silane, Siloxane, Silane-Siloxane Blend, and Siliconate Water Repellents:
 - 1. BASF Construction Chemicals: www.buildingsystems.basf.com/#sle.
 - 2. Concrete Sealers USA: www.concretesealersusa.com/#sle.
 - 3. Dayton Superior Corporation: www.daytonsuperior.com/#sle.
 - 4. Sherwin-Williams Company: www.sherwin-williams.com/#sle.
 - 5. W. R. Meadows, Inc: www.wrmeadows.com/#sle.
 - 6. Substitutions: See Section 016000 - Product Requirements.

2.02 MATERIALS

- A. Water Repellent: Non-glossy, colorless, penetrating, water-vapor-permeable, non-yellowing sealer, that dries invisibly leaving appearance of substrate unchanged.
 - 1. Applications: Vertical surfaces and non-traffic horizontal surfaces.
 - 2. Number of Coats: Two.
 - 3. Moisture Absorption When Applied to Masonry: Five percent, maximum, when tested in accordance with ASTM C140/C140M using masonry sample completely coated with water repellent.
 - 4. Moisture Absorption When Applied to Concrete: Five percent, maximum, when tested in accordance with ASTM C642 concrete sample completely coated with water repellent.
 - 5. Silane, siloxane, silane-siloxane blend, or siliconate that reacts chemically with concrete, masonry, and acts as graffiti repellent.
 - a. Manufacturers:
 - 1) BASF Construction Chemicals: www.buildingsystems.basf.com/#sle.
 - 2) Dayton Superior Corporation: www.daytonsuperior.com/#sle.
 - 3) Sherwin-Williams Company; Loxon 40 percent Low VOC Silane Water Repellant, with VOC of 343 g/L or less: www.sherwin-williams.com/#sle.
 - 4) W. R. Meadows, Inc; PENTREAT 244-40: www.wrmeadows.com/#sle.
 - 5) Substitutions: See Section 016000 - Product Requirements.
 - 6. Water-based siloxane, silane, or blend that reacts chemically with concrete and masonry.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify joint sealants are installed and cured.
- B. Verify surfaces to be coated are dry, clean, and free of efflorescence, oil, or other matter detrimental to application of water repellent.

3.02 PREPARATION

- A. 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. Remove loose particles and foreign matter.
- D. Remove oil and foreign substances with a chemical solvent that will not affect water repellent.
- E. Scrub and rinse surfaces with water and let dry.
- F. Allow surfaces to dry completely to degree recommended by water repellent manufacturer before starting coating work.

3.03 APPLICATION

- A. Apply water repellent in accordance with manufacturer's instructions, using procedures and application methods recommended as producing the best results.
- B. Apply at rate recommended by manufacturer, continuously over entire surface.
- C. Apply two coats, minimum.
- D. Remove water repellent from unintended surfaces immediately by a method instructed by water repellent manufacturer.

END OF SECTION

SECTION 072100 - THERMAL INSULATION

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Board insulation at perimeter foundation wall and over roof deck.
- B. Batt insulation in exterior wall construction.
- C. Batt insulation for filling perimeter window and door shim spaces and crevices in exterior wall and roof.

1.02 RELATED REQUIREMENTS

1.03 REFERENCE STANDARDS

- A. ASTM C578 - Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation; 2023.
- B. ASTM C665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing; 2024.
- C. ASTM C1289 - Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board; 2025.
- D. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2024.
- E. ASTM E136 - Standard Test Method for Assessing Combustibility of Materials Using a Vertical Tube Furnace at 750 Degrees C; 2024c.

1.04 SUBMITTALS

- A. See Section 013000 - 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.
- B. Insulation in Metal Framed Walls: Batt insulation with no vapor retarder.
- C. Insulation over Roof Deck: Polyisocyanurate board.

2.02 FOAM BOARD INSULATION MATERIALS

2.03 Extruded-Polystyrene Board Insulation: ASTM C 578, of type and density indicated below, with maximum flame-spread and smoke-developed indexes of 75 and 450, respectively:

- A. Manufacturers:
 - 1. DiversiFoam Products.
 - 2. Dow Chemical Company.
 - 3. Owens Corning.
 - 4. Pactiv Building Products Division.
- B. Type IV, 1.60 lb/cu. ft. (26 kg/cu. m), unless otherwise indicated.
- C. Thickness: 2 inch minimum for perimeter foundation insulation.
- D. Protection Board: As recommended by insulation manufacturer.

2.04 Polyisocyanurate (ISO) Board Insulation: Rigid cellular foam, comply with ASTM C1289.

- A. Polyisocyanurate Foam Rigid Insulation: Compressive strength per ASTM D1621, 25 psi minimum, flexural strength of 40 psi min. per ASTM C203. Water absorption per ASTM C209 40 psi min. for 1" foam core. Water vapor permeance less than .03 per ASTM E96. Nominal density range of 2 pcf per ASTM D1622
 - 1. Basis of Design Manufacturer: Subject to compliance with requirements, provide product by Dow Chemical Company, "Tuff-R" or a comparable product by one of the following:
 - a. Carlisle Coatings & Waterproofing
 - b. Hunter Panels
 - c. Rmax, Inc.
 - 2. Thickness: As indicated.
 - 3. Flame Propagation Test: Materials and construction shall be as tested according to NFPA 285.

4. Accessories:
 - a. Adhesive: Provide adhesive for attachment of insulation to cmu as recommended by insulation manufacturer.
 - b. Gap and Crack Filler: As recommended by insulation manufacturer as part of their system.

2.05 FOAMED-IN-PLACE INSULATION

- A. Foamed-In-Place Insulation: Medium-density, rigid or semi-rigid, closed cell polyurethane foam; foamed on-site, using blowing agent of water or non-ozone-depleting gas.
 1. Regulatory Requirements: Comply with applicable code for flame and smoke, concealment, and fire protection requirements.
 2. Thermal Resistance: R-value (RSI-value) of 7.1 (1.25), minimum, per 1-inch (25.4 mm) thickness at 75 degrees F (24 degrees C) mean temperature when tested in accordance with ASTM C518.
 3. Water Vapor Permeance: Vapor retarder; 2 perms (115 ng/(Pa s sq m)), maximum, when tested at intended thickness in accordance with ASTM E96/E96M, desiccant method.
 4. Air Permeance: 0.04 cfm per square foot (0.2 L/(s/sq m)), maximum, when tested at intended thickness in accordance with ASTM E2178 at 1.57 psf (75 Pa).
 5. Closed Cell Content: At least 90 percent.
 6. Surface Burning Characteristics: Flame spread/smoke developed index of 25/450, maximum, when tested in accordance with ASTM E84.

2.06 GLASS-FIBER BLANKET INSULATION MATERIALS

- A. Manufacturers:
 1. CertainTeed Corporation.
 2. Guardian Fiberglass, Inc.
 3. Johns Manville.
 4. Knauf Fiber Glass.
 5. Owens Corning.
- B. Acoustic Blanket Insulation
 1. Basis of Design: Owens Corning Insulation – Select Sound FF- Black Acoustic Board – Black 2" Thick – Duct Liner
- C. Unfaced, Glass-Fiber Blanket Insulation: ASTM C 665, Type I (blankets without membrane facing); consisting of fibers; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively; passing ASTM E 136 for combustion characteristics.

- D. Reinforced-Foil-Faced, Glass-Fiber Blanket Insulation: ASTM C 665, Type III (reflective faced), Class A (faced surface with a flame-spread index of 25 or less); Category 1 (membrane is a vapor barrier), faced with foil scrim, foil-scrim kraft, or foil-scrim polyethylene.
- E. Where glass-fiber blanket insulation is indicated by the following thicknesses, provide blankets in batt or roll form with thermal resistances indicated:
 - 1. 5-1/2 inches (140 mm) thick with a thermal resistance of 19 deg F x h x sq. ft./Btu at 75 deg F (3.3 K x sq. m/W at 24 deg C).
 - 2. Provide unfaced 2-1/2 inch blanket insulation for acoustic batt applications

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that substrate, adjacent materials, and insulation materials are dry and that substrates are ready to receive insulation.
- B. Verify substrate surfaces are flat, free of honeycomb, fins, irregularities, or materials or substances that may impede adhesive bond.

3.02 BOARD INSTALLATION AT FOUNDATION PERIMETER

- A. Adhere a 6 inches (152 mm) wide strip of polyethylene sheet over construction, control, and expansion joints with double beads of adhesive each side of joint.
 - 1. Tape seal joints.
 - 2. Extend sheet full height of joint.
- B. Install boards horizontally on foundation perimeter.
- C. Cut and fit insulation tightly to protrusions or interruptions to the insulation plane.

3.03 Board Installation Using Cladding and Continuous Insulation Supports

- A. Install supports in accordance with manufacturer's installation instructions.
- B. Install supports in compliance with system orientation, sizes, and locations as indicated on drawings and in accordance with approved shop drawings.
- C. Install supports to fill in exterior wall spaces without gaps or voids in insulation.
- D. Trim insulation neatly to fit spaces and provide a continuous thermal layer.

3.04 BOARD INSTALLATION OVER LOW SLOPE ROOF DECK

- A. Installation of board insulation over low slope roof deck, see Section .

B. Board Installation Over Roof Deck, General:

1. See applicable roofing specification section for specific board installation requirements.
2. Fasten insulation to deck in accordance with roofing manufacturer's written instructions and applicable Factory Mutual requirements.
3. Do not apply more insulation than can be covered with roofing on the same day.

3.05 BATT INSTALLATION

- A. Install insulation in accordance with manufacturer's instructions.
- B. Install in exterior wall and roof spaces without gaps or voids. Do not compress insulation.
- C. Trim insulation neatly to fit spaces. Insulate miscellaneous gaps and voids.
- D. Fit insulation tightly in cavities and tightly to exterior side of mechanical and electrical services within the plane of the insulation.

3.06 FIELD QUALITY CONTROL

- A. See Section 014000 - Quality Requirements for additional requirements.

3.07 PROTECTION

- A. Do not permit installed insulation to be damaged prior to its concealment.

END OF SECTION

SECTION 072165 - THERMAL, WATER AND AIR BARRIER SYSTEM

GENERAL

1.01 SUMMARY

- A. This Section Includes:
 - 1. Thermal, water and air barrier system consisting of rigid insulation with liquid-applied flashing and spray-foam insulation.
- B. Related Sections:
 - 1. Section 042000 "Unit Masonry" for coordination of masonry flashing.
 - 2. Section 072100 "Thermal Insulation" for thermal insulation products and systems not included in this section.

1.02 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.

1.03 INFORMATIONAL SUBMITTALS

- A. Product Test Reports: Submit evaluation reports published by independent laboratory indicating evidence of compliance with specified criteria.
 - 1. NFPA 285 Compliance: Contractor must submit documentation showing all components in the wall assembly are in compliance with NFPA 285.

1.04 PREINSTALLATION MEETINGS

- A. Pre-installation Meeting: Prior to commencement of application of wall system, review and document methods and procedures related to installation, including the following:
 - 1. Participants: Authorized representatives of the Contractor, Owner, Commissioning Agent, Architect, Owner's consultant, and System Installer/Applicator.
 - 2. Review sheathing and metal wall framing for potential interference and conflicts.
 - 3. Review insulation board and flashing, and application methods and procedures.
 - 4. Review construction schedule and confirm availability of products, applicator personnel, equipment and facilities.
 - 5. Review governing regulatory requirements.
 - 6. Review field quality control procedures.

1.05 QUALITY ASSURANCE

- A. Mock-Up: An Exterior Wall Mock-Up, including masonry, window, flashings, copings, metal wall panels, insulation, glazing, sealants, etc., as indicated on the drawings, will be required for review by Architect before proceeding with Work.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Protect materials from physical damage and from deterioration due to moisture, soiling, and other sources. Store inside and in a dry location. Comply with manufacturer's written instructions for handling, storing, and protecting during installation.

1.07 FIELD CONDITIONS

- A. Application Temperatures: Comply with manufacturer's written instructions.

1.08 WARRANTY

- A. Special Warranty: Provide manufacturer's standard warranty for the thermal, water and air barrier system: Exposure-6 month, Thermal-15 year, and Water penetration-15 year.

PRODUCTS

2.01 SYSTEM DESCRIPTION - GENERAL

- A. Basis of Design: Subject to compliance with requirements, provide Dow Building Solutions, THERMAX™ X-ARMOR Wall System consisting of exterior rigid insulation, liquid-applied flashing and spray foam insulation in stud cavity to form a continuous thermal, air, and water barrier, or comparable system by one of the following:
 - 1. Henry – R2 + Sheathing “Formerly Carlisle”.
 - 2. Additional Requirements for Comparable Products:
 - a. Proposed comparable systems shall certify that the overall system meets the stated performance requirements and that each component, individually, is comparable to specified products.
 - b. Proposed comparable systems shall satisfy all aspects required of the basis of design system in the design of the building envelope whether or not specifically stated.
- B. The thermal, water and air barrier system shall include all accessories necessary to create a continuous building enclosure, and the following:
 - 1. Insulation boards secured through the sheathing to the exterior wall framing.
 - 2. Joint, penetration and gap sealing material for sealing component joints, penetrations through the wall system and gaps between the building envelope enclosure components and wall opening frames.

2.02 PERFORMANCE REQUIREMENTS

- A. System Performance Characteristics:
 - 1. Thermal performance:
 - a. Exterior (board) insulation: ASTM C518, Stabilized R-value of minimum of 6.0 per inch.

2. Air barrier performance: When tested in accordance with ASTM E2357, at a test pressure of not less than 6.24 psf, air infiltration shall not exceed 0.04 cfm per square foot (0.2L/*m2) of fixed wall area.
3. Water penetration: When tested in accordance with ASTM E331, no uncontrolled water penetration shall occur at a minimum differential pressure of 6.24 psf for minimum test duration of 2 hours.
4. Mold resistance: Wall system components shall provide non-food source for fungal growth.
5. Code Compliance: Wall system and component materials shall comply with the following requirements:
 - a. Exterior Insulation:
 - 1) Class A classified at max thickness per UL 723 criteria or ASTM E84 criteria.
 - 2) Fire Propagation Characteristics: Passes NFPA 285 testing as part of an approved assembly.
 - b. System complies with ASTM E2357: Test Method for determining Air Leakage of Air Barrier Assemblies.
 - c. System complies with NFPA 285: Standard method of Testing for the Evaluation of Flammability Characteristics of Exterior Non-Load-Bearing Wall Assemblies containing Combustible components using the Intermediate Scale, Multi-Story Test Apparatus.

2.03 COMPONENTS

- A. Barrier Insulation (sheathing): Foil faced polyisocyanurate foam board insulation, ASTM C 1289, Type I, Class2.
 1. The Dow Chemical Company "THERMAX™ XARMOR CI Exterior Insulation."
 - a. Panel Size: 48 inches wide x 96 inches long, shi lap panels.
- B. Barrier Flashing: Seam and punch opening flashing treatment: The Dow Chemical Company "LIQUIDARMOR™ CM" spray flashing and sealant.
- C. Spray Polyurethane Foam: Two component spray polyurethane foam insulation applied to the interior face of the barrier insulation, complying with ASTM C 1029.
 1. The Dow Chemical Company "STYROFOAM Brand Spray Polyurethane Foam Insulation – CM 2030.
- D. Accessories:
 1. Board Insulation Bonding Adhesive: As recommended by barrier manufacturer.
 2. Fasteners: Provide insulation board manufacturer's recommended polymer or other corrosion protective coated steel screw fasteners for anchoring insulation board to metal wall framing. Fastener length and size based on wall insulation thickness.
 - a. Products: Rodenhouse, Inc. 2 inches diameter "THERMAL-GRIP ci Prong washers" plastic washers which can be installed using either bulk Grip-Deck self-drilling screws or collated Grip-Deck screws.
 3. Penetration Filler: Provide insulation board manufacturer's recommended polyurethane foam for sealing penetrations of insulation board.

- a. Products: The Dow Chemical Company “GREAT STUFF PRO™ Window & Door” single-component polyurethane low-pressure foam sealant.
- 4. Barrier Insulation Facer Repair: Provide insulation board manufacturer’s recommended flashing for repairs of damaged facer.
 - a. Products: The Dow Chemical Company “LIQUIDARMOR™ CM” spray flashing and sealant.

EXECUTION

3.01 PREPARATION

- A. Clean substrates of substances that are harmful to insulation or that interfere with insulation attachment.
- B. Prepare report identifying conditions that may be detrimental to the performance of the insulation.
- C. Proceed with installation only after the conditions noted have been properly addressed.

3.02 INSTALLATION

- A. Comply with Thermal Water and Air Barrier System manufacturer’s written instructions.
- B. Barrier Insulation:
 - 1. Install insulation in accordance with Manufacturer’s recommendations: Fasten to exterior face of exterior metal stud wall framing using insulation board Manufacturer’s recommended type and length screw fasteners with washers. Abut panels tightly together and around openings and penetrations.
 - 2. Install insulation boards horizontally with labeled aluminum facing to exterior. Use maximum lengths to minimize number of joints. Locate edge joints parallel to and on framing. Center end joints over supports in each course.
 - 3. Fasten panels to each support with fasteners spaced 12 inches on center at perimeter of the wall and 16 inches on center in panel field. Set back perimeter fasteners 3/8 inches from edges and ends of panel units. Drive fasteners to bear tight and flush with surface of insulation. Maximum of two board joints may be bridged per fastener.
 - a. Coordinate location of fasteners with attachment for the exterior wall finish system.
 - 4. Install flashing at end and edge joints in accordance with insulation board Manufacturer’s joint sealing recommendations.
 - 5. Install flashing behind wall tie and mechanical fastening assemblies for rain screen claddings according to manufacturer’s recommendations.
 - 6. Seal panel joints and penetrations in accordance with insulation board manufacturer’s joint and penetration sealing recommendations.
 - 7. After base flashing is installed on exterior of insulation board, install fluid-applied flashing to the exterior and lap over the top edge of the base.
- C. Barrier Flashing:
 - 1. Surface and ambient temperatures should be 35 deg F and rising and below 120 deg F during the application.
 - 2. Do not apply product on surfaces with standing water or frost.
 - 3. Avoid installing on days with a high probability of significant rainfall.

4. Seal any gaps greater than ¼ inches with penetration filler or compatible sealant according to Manufacturer's recommendations, prior to applying barrier flashing. If facer on insulation board is damaged apply additional spray. Damaged insulation can also be replaced or barrier flashing can be used to repair facer flaws.
 5. Flash board joints, penetrations and other fenestration openings as required with a minimum 50 wet mils (+/-5 mils). Spray can be applied on one or two passes depending on site conditions.
 6. Apply 3 inches (+/-1 inch) over the board joints. Make sure that a minimum of 1 inch of spray covers each side of the joint. Fasteners and washers along the board joints should also be completely covered with barrier flashing.
 7. For rough openings apply barrier flashing a minimum of 3 inches onto the wall face, completely covering the insulation board edge. In turn extend spray a minimum of 3 inches back onto the rough opening substrate. Cover a distance back onto the rough opening equal to what is covered by traditional flashing materials.
 8. For penetrations through the rigid insulation or substrate apply barrier flashing a minimum of 2 inches onto the wall face and a minimum of 2 inches onto the penetration substrate or primary flashing substrate.
 9. Use wet mil thickness gauge to ensure proper installation thickness. A paint brush can be used to even out product application thickness. If product is consistently below minimum thickness spray another pass to achieve proper thickness requirements.
- D. Spray Polyurethane Foam:
1. Mask and cover adjacent areas to protect from overspray.
 2. Apply primers for special conditions as recommended by manufacturer.
 3. Cover wide joints with transition sheet membrane as recommended by manufacturer.
 4. Verify substrate temperature meets manufacturer's requirements for specific formulations used.
 5. Verify that necessary stud cavity firestopping materials have been installed prior to application of SPF.
 6. Apply SPF in accordance with ASTM C1029.
 - a. Apply SPF by picture framing around interior studs at insulation sheathing and stud interface, and apply one pass across insulation board joints and penetrations.
 - b. Apply single pass of SPF not exceeding 1-1/2 inch (38 mm) in thickness; two passes are acceptable to reach maximum thickness of 1-1/2 inch (38 mm).
 - c. When more than one layer is being applied to provide for higher thermal resistance, allow first layer to cool to temperature as recommended by manufacturer of stud cavity SPF insulation.
 - d. Maintain at least 3 inch (76 mm) clearance around chimneys, heating vents, steam pipes, recessed lighting fixtures and other heat sources.
 - e. Do not apply SPF to inside of exit openings or electrical junction boxes.
 - f. Install continuous layer of SPF insulation from floor to floor or floor to roof to ensure continuous air and water vapor barrier.
 - g. Allow for following maximum variation in applied thickness; minus 1/4 inch (6.4 mm), and plus 5/8 inch (15.9 mm).

3.03 FIELD QUALITY CONTROL

- A. Submit spray polyurethane foam (SPF) field inspection and test reports for the following:

1. Installer shall complete daily work record and record other required information including results of completed testing.
 - a. Maintain copies of daily work record on site for routine inspection.
 - b. Provide copies of daily work record to insulation system manufacturer, Owner or Owner's Representative upon request.
2. Contractor is responsible for maintaining daily work record of any required testing and inspections.
3. Installer's daily work record shall verify conformance with manufacturer's installation instructions, and specified requirements.

3.04 PROTECTION

- A. Protect installed insulation and flashing from damage due to harmful weather exposures, physical abuse, and other causes. Provide temporary coverings or enclosures where insulation is subject to abuse and cannot be concealed and protected by permanent construction immediately after installation.
- B. Promptly repair damage caused to insulation and/or flashing in a manner that restores the integrity of the entire system.
- C. Promptly cover board insulation with cladding; within maximum of 180 days after installation.

END OF SECTION 072165

SECTION 072726 - FLUID-APPLIED MEMBRANE AIR BARRIERS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Fluid-applied membrane air barriers.

1.02 RELATED REQUIREMENTS

- A. Section 054000 - Cold-Formed Metal Framing: Exterior metal stud walls.
- B. Section 061000 - Rough Carpentry: Exterior sheathing.
- C. Section 079200 - Joint Sealants: Sealants applied to adjacent work.

1.03 DEFINITIONS

- A. Air Barrier: Airtight barrier made of material that is relatively air impermeable but water vapor permeable, both to degree specified, with sealed seams and with sealed joints to adjacent surfaces.

1.04 REFERENCE STANDARDS

- A. ASTM E96/E96M - Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials; 2024a.
- B. ASTM E2178 - Standard Test Method for Determining Air Leakage Rate and Calculation of Air Permeance of Building Materials; 2021a.
- C. ASTM E2357 - Standard Test Method for Determining Air Leakage Rate of Air Barrier Assemblies; 2025.

1.05 SUBMITTALS

- A. See Section 013000 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide data on material characteristics, performance criteria, and limitations.
- C. Manufacturer's qualification statement.
- D. Warranty Documentation: Submit manufacturer's warranty and ensure that forms have been completed in Owner's name and are registered with manufacturer.

1.06 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years of documented experience.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to project site in original packaging with seals unbroken and properly labeled.
- B. Store materials in their original undamaged packaging within clean, dry, and protected location at a temperature less than 90 degrees F (32 degrees C).

1.08 FIELD CONDITIONS

- A. Maintain temperature and humidity recommended by materials manufacturer before, during, and after installation.
 - 1. Do not apply air barrier products when air or substrate temperatures are above 100 degrees F (38 degrees C) or below 20 degrees F (minus 6 degrees C).
 - 2. Allow wet substrates to dry prior to applying air barrier products.

1.09 WARRANTY

- A. See Section 017800 - Closeout Submittals for additional warranty requirements.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Fluid-Applied Membrane Air Barrier:
 - 1. Dow: www.dow.com/#sle.
 - 2. Substitutions: See Section 016000 - Product Requirements.

2.02 FLUID-APPLIED MEMBRANE AIR BARRIER ASSEMBLY

- A. Applications:
 - 1. Exterior Sheathing on Steel Stud Walls:
 - a. See Section 054000 for steel studs.
 - b. See Section 061000 for exterior sheathing.
 - c. See Section 079200 for joint sealants applied to adjacent work.
- B. Fluid-Applied Membrane Air Barrier: Single-component, vapor permeable, 100 percent silicone elastomeric air barrier.
 - 1. Air Permeance: 0.004 cfm/sq ft (0.02 L/sec sq m) maximum leakage when tested at 1.57 psf (75 Pa) pressure difference in accordance with ASTM E2178.
 - 2. Vapor Permeance: 10 perms (574 ng/(Pa s sq m)), minimum, when tested in accordance with ASTM E96/E96M using Desiccant Method at 73.4 degrees F (23 degrees C).
 - 3. Air Barrier Leakage: Not greater than 0.04 cfm/sq ft (0.2 L/sq m) of surface area at pressure of 1.57 psf (75 Pa) when tested in accordance with ASTM E2357.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that surfaces and conditions are ready to accept work of this section.
- B. Verify that surfaces are clean, dry, and free of frost, dust, dirt, grease, oil, curing compounds, form release agents, laitance, efflorescence, mildew, excess alkalinity, and other conditions affecting performance of this work.

3.02 PREPARATION

- A. Protect work of other trades against damage from application of air barrier coatings.
- B. Protect adjacent surfaces not designated to receive air barrier coatings; provide protection for pedestrians, vehicles, landscaping, and surrounding areas to prevent contact with coating materials.
- C. Clean substrates to remove contaminants and foreign material by pressure cleaning, wire brushing, grinding or other method recommended by air barrier coatings manufacturer.
- D. Prepare substrates in accordance with air barrier coating manufacturer's written instructions.
- E. Repair deteriorated or damaged substrates, repair masonry joints, and fill cracks, voids, honeycombs, and other defects using materials as recommended by air barrier coating manufacturer, and allow patching materials to fully cure.
 - 1. Remove projections, protruding fasteners, and loose or foreign matter that might interfere with proper installation.
 - 2. Fill cracks larger than 1/16 inch (1.6 mm) wide using applicable joint sealant, and fill cracks larger than 1 inch (25.4 mm) wide using joint sealant and compatible bond breaker where movement is expected.

3.03 APPLICATION

- A. Apply air barrier system materials in accordance with manufacturer's instructions.
- B. Transition Strips and Silicone Sealants: Install with approved sealants in accordance with manufacturer's written instructions.
 - 1. Form sealed joints to windows, wall framing systems, door and louver frames, roofing system perimeters, and at interface with other adjacent materials utilizing compatible components that form air barrier assembly.
- C. Air Barrier Coating: Apply air barrier coating using application methods and rate of application recommended by manufacturer, using nap roller or airless sprayer, in accordance with requirements of authorities having jurisdiction (AHJ).
 - 1. Provide wet application not less than 30 mils, 0.030 inch (0.76 mm) thick, or more as required by substrate conditions, with dry film thickness (DFT) not less than 15 mils, 0.015 inch (0.38 mm) thick.

3.04 CLEANING

- A. During completion of this work, remove overspray and excess material, using materials and methods approved by manufacturer that will not damage adjacent materials.
- B. Clean and repair adjacent surfaces damaged by air barrier coating application.

3.05 PROTECTION

- A. Do not leave materials exposed to weather longer than recommended by manufacturer.
- B. Allow air barrier coatings to fully cure before exposure to traffic or other construction operations.

END OF SECTION

SECTION 074213 - METAL WALL PANELS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Manufactured metal panels for exterior wall panels and soffit panels, with insulation, related flashings, and accessory components.

1.02 RELATED REQUIREMENTS

- A. Section 054000 - Cold-Formed Metal Framing: Wall panel substrate.
- B. Section 072500 - Weather Barriers: Weather barrier under wall panels.
- C. Section 079200 - Joint Sealants: Sealing joints between metal wall panel system and adjacent construction.

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. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2025.

1.04 SUBMITTALS

- A. See Section 013000 - Administrative Requirements for submittal procedures.
- B. Product Data - Wall System: Manufacturer's data sheets on each product to be used, including:
 - 1. Physical characteristics of components shown on shop drawings.
 - 2. Storage and handling requirements and recommendations.
 - 3. Installation instructions and recommendations.
- C. Shop Drawings: Indicate dimensions, layout, joints, construction details, support clips, and methods of anchorage.
- D. Samples: Submit two samples of wall panel and soffit panel, 12 inches by 12 inches (305 mm by 305 mm) in size illustrating finish color, sheen, and texture.
- E. Manufacturer's qualification statement.
- F. Delegated Design Submittals:
 - 1. Provide engineered attachment system to meet manufacturers' requirements of attachments of the metal panel system.
 - 2. Include any necessary clips or attachments of metal panel to designed wall system.
 - 3. Show layout of framing, clips, and fasteners as part of the submitted shop drawings.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with minimum three years of documented experience.

1.06 MOCK-UPS

- A. See Section 014000 - Quality Requirements for additional requirements.
- B. Construct mock-up, 6 feet long by 7 feet height; include panel and soffit system, glazing, attachments to building frame, associated vapor retarder and air seal materials, weep drainage system, sealants and seals, brick, and related insulation in mock-up.
- C. Locate as directed by Architect.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Protect panels from accelerated weathering by removing or venting sheet plastic shipping wrap.
- B. Store prefinished material off 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.

1.08 FIELD CONDITIONS

- A. Do not install wall panels when air temperature or relative humidity are outside manufacturer's limits.

1.09 WARRANTY

- A. See Section 017800 - 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 MANUFACTURERS

- A. Metal Wall Panels - Concealed Fasteners:
 - 1. MP-01 – Morin: Matrix Wall System – 12" Wide – Dark Bronze
 - a. MWP-1 – MX-6
 - b. MWP-2 – MX-1
 - c. MWP-3 – MX-2
 - d. MWP-4 – MX-3

2. MP-02 – Longboard: Tongue & Groove Planks – Light Oak
 3. MP-03 – Morin: Matrix Wall System – MX-0 – 18” Wide – Dark Bronze to Match MP-01
 4. Substitutions: See Section 016000 - Product Requirements.
- B. Metal Soffit Panels:
1. Longboard: Tongue & Groove Planks.
 2. Type: 6” V-groove Plank
 3. Wood Grain – Non-vented
 4. Substitutions: See Section 016000 - Product Requirements.

2.02 METAL WALL PANEL SYSTEM

- A. Wall Panel System: Factory fabricated prefinished metal panel system, site assembled.
1. Provide exterior wall panels and soffit panels.
 2. Design and size components to support assembly dead loads, and to withstand live loads caused by positive and negative wind pressure acting normal to plane of wall.
 3. Maximum Allowable Deflection of Panel: $L/180$ for length(L) of span.
 4. Movement: Accommodate movement within system without damage to components or deterioration of seals, movement between system and perimeter components when subject to seasonal temperature cycling; dynamic loading and release of loads; and deflection of structural support framing.
 5. Drainage: Provide positive drainage to exterior for moisture entering or condensation occurring within panel system.
 6. Fabrication: Formed true to shape, accurate in size, square, and free from distortion or defects; pieces of longest practical lengths.
 7. Corners: Factory-fabricated in one continuous piece with minimum 2-inch (51 mm) returns.
- B. Exterior Wall Panels:
1. Profile: Vertical; style as indicated.
 2. Side Seams: Double-interlocked, tight-fitting
 3. Material: Precoated steel sheet, 22 gauge, 0.0299 inch (0.76 mm) minimum thickness.
 4. Panel Width: Varies inches.
 5. Color: As selected by Architect from manufacturer's full line.
- C. Soffit Panels:
1. Profile: Style as indicated
 2. Material: Precoated steel sheet, 22 gauge, 0.0299 inch (0.76 mm) minimum thickness.
 3. Color: As selected by Architect from manufacturer's full line.
- D. Internal and External Corners: Same material, thickness, and finish as exterior sheets; profile to suit system; shop cut and factory mitered to required angles.
- E. Trim: Same material, thickness and finish as exterior sheets; brake formed to required profiles.
- F. Anchors: Galvanized steel.

2.03 MATERIALS

- A. Precoated Steel Sheet: Hot-dipped galvanized steel sheet, ASTM A653/A653M, Structural Steel (SS) or Forming Steel (FS), with G90/Z275 coating; continuous coil-coated on exposed surfaces with specified finish coating and on panel back with specified panel back coating.

2.04 FINISHES

- A. 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 (0.023 mm); color and gloss as selected by Architect from manufacturer's standard line.

2.05 ACCESSORIES

- A. Support for Cladding and Continuous Insulation: Thermal clips.
 - 1. Thermally-broken clips that provide attachment support for girts, angles, channels, and other cladding support framing.
 - 2. Clip Depth: As required for thickness of insulation.
 - 3. Fasteners: As recommended by clip manufacturer.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that building framing members are ready to receive panels.

3.02 INSTALLATION

- A. Install panels on walls and soffits in accordance with manufacturer's instructions.
- B. Fasten panels to structural supports; aligned, level, and plumb.
- 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.

3.03 TOLERANCES

- A. Offset From True Alignment Between Adjacent Members Abutting or In Line: 1/16 inch (1.6 mm), maximum.
- B. Variation from Plane or Location As Indicated on Drawings: 1/4 inch (6.4 mm), maximum.

3.04 CLEANING

- A. Remove site cuttings from finish surfaces.
- B. Remove protective material from wall panel surfaces.

3.05 PROTECTION

- A. Protect metal wall panels until completion of project.
- B. Touch-up, repair, or replace damaged wall panels or accessories before Date of Substantial Completion.

END OF SECTION

SECTION 075300 - EPDM THERMOSET SINGLE-PLY ROOFING

GENERAL

1.01 SECTION INCLUDES

- A. EPDM thermoset single-ply roofing.
- B. Membrane flashings.
- C. Metal flashings.
- D. Roof insulation.
- E. Air/Vapor Barrier
- F. Walkway Pads

1.02 RELATED SECTIONS

- A. Section 05 31 23 - Steel Roof Decking.
- B. Section 06 10 00 - Rough Carpentry.
- C. Section 07 62 00 - Sheet Metal Flashing and Trim.
- D. Section 07 72 00 - Roof Accessories.

1.03 REFERENCES

- A. American Society of Civil Engineers (ASCE) - ASCE 7 - Minimum Design Loads for Buildings and Other Structures, Current Revision.
- B. ANSI/SPRI WD-1 Wind Design Standard for Roofing Assemblies.
- C. ASTM International (ASTM):
 - 1. ASTM C 578 - Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation.
 - 2. ASTM C 1289 - Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board.
 - 3. ASTM D 412 - Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers-Tension.
 - 4. ASTM D 624 - Standard Test Method for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomers.
 - 5. ASTM D 4637 - Standard Specification for EPDM Sheet Used In Single-Ply Roof Membrane.
 - 6. ASTM E 96 - Standard Test Methods for Water Vapor Transmission of Materials.
- D. Factory Mutual (FM Global):
 - 1. Approval Guide.
 - a. Factory Mutual Standard 4470 - Approval Standard for Class 1 Roof Covers.
 - b. Loss Prevention Data Sheets 1-28, 1-29.
- E. International Code Council (ICC):
 - 1. International Building Code (IBC).

- F. National Roofing Contractors Association (NRCA) - Low Slope Roofing and Waterproofing Manual, Current Edition.
- G. Sheet Metal and Air Conditioning Contractors National Association, Inc. (SMACNA) - Architectural Sheet Metal Manual.
- H. Underwriters Laboratories (UL):
 - 1. TGFU R1306 - "Roofing Systems and Materials Guide".
 - 2. UL-790 - Standard Test Method for Fire Tests of Roof Coverings.
- I. ANSI/ASHRAE/IESNA Standard 90.1 (2007): Energy Standard for Buildings Except Low-Rise Residential Buildings

1.04 DESIGN CRITERIA

- A. Wind Uplift Performance:
 - 1. Roof system is designed to withstand wind uplift forces as calculated using the current revision of ASCE-7.
 - 2. Roof System is designed to meet uplift per structural sheet S0.2
 - 3. Allowable Stress Design of 90 MPH wind speed.
- B. Fire Resistance Performance:
 - 1. Roof system will achieve a UL Class A rating when tested in accordance with UL-790.
- C. Thermal Performance: Roof system will achieve a minimum R value not less than 30.
- D. Drainage: Provide a roof system with positive drainage where all standing water dissipates within 48 hours after precipitation ends.
- E. Building Codes:
 - 1. Roof system will meet the requirements of all federal, state and local code bodies having jurisdiction.

1.05 SUBMITTALS

- A. Submit under provisions of Section 01 30 00.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
 - 1. Preparation instructions and recommendations.
 - 2. Storage and handling requirements and recommendations.
 - 3. Installation methods.
- C. Detail Drawings:
 - 1. Submit approved plan, section, elevation or isometric drawings which detail the appropriate methods for all flashing conditions found on the project.
 - 2. Coordinate approved drawings with locations found on the Contract Drawings.
- D. Selection Samples: For each finish product specified, two complete sets of chips representing manufacturer's full range of available colors, membranes, and thicknesses.
- E. Verification Samples: For each finish product specified, two samples, minimum size 4 inches (100 mm) square representing actual product, color, and patterns.

1.06 QUALITY ASSURANCE

- A. Manufacturer Qualifications: All products specified in this section will be supplied by a single manufacturer with a minimum of twenty (20) years experience.
- B. Installer Qualifications:
 - 1. All products listed in this section are to be installed by a single installer with a minimum of five (5) years demonstrated experience in installing products of the same type and scope as specified.
 - 2. Installer must be capable of extending the Manufacturer's Labor and Materials guarantee.
 - 3. Installer must be capable of extending the Manufacturer's No Dollar Limit guarantee.
 - 4. Installer office must be within 150 miles of the project location.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's unopened packaging until ready for installation.
- B. Store and dispose of hazardous materials, and materials contaminated by hazardous materials, in accordance with requirements of local authorities having jurisdiction.

1.08 PROJECT CONDITIONS

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.
- B. Safety Data Sheets (SDS) must be on location at all times during the transportation, storage and application of materials.
- C. When positioning membrane sheets, exercise care to locate all field splices away from low spots and out of drain sumps. All field splices should be shingled to prevent bucking of water.
- D. When loading materials onto the roof, the Roofing Applicator must comply with the requirements of the building owner to prevent overloading and possible disturbance to the building structure.
- E. Proceed with roofing work only when weather conditions are in compliance with the manufacturer's recommended limitations, and when conditions will permit the work to proceed in accordance with the manufacturer's requirements and recommendations.
- F. Proceed with work so new roofing materials are not subject to construction traffic. When necessary, new roof sections shall be protected and inspected upon completion for possible damage.
- G. Provide protection, such as 3/4 inch thick plywood, for all roof areas exposed to traffic during construction. Plywood must be smooth and free of fasteners and splinters.
- H. The surface on which the insulation or roofing membrane is to be applied shall be clean, smooth, dry, and free of projections or contaminants that would prevent proper application of or

be incompatible with the new installation, such as fins, sharp edges, foreign materials, oil and grease.

- I. New roofing shall be complete and weathertight at the end of the workday.
- J. Contaminants such as grease, fats and oils shall not be allowed to come in direct contact with the roofing membrane.

1.09 WARRANTY

- A. At project closeout, provide to Owner or Owners Representative an executed copy of the manufacturer's Total-System warranty, outlining its terms, conditions, and exclusions from coverage.
 - 1. Base Bid: 30 year (90 mil EPDM).
 - 2. Coverage to be extended to include damage caused by winds up to 85 mph and a maximum 1.5" diameter hail in accordance with terms stated in the Warranty document.

PRODUCTS

2.01 MANUFACTURERS

- A. Basis of Design: Carlisle SynTec Systems, which is located at: P. O. Box 7000; Carlisle, PA 17013; ASD Toll Free Tel: ; 800-4-SYNTEC; Tel: ; 717-245-7000; Email gary@hornerassocd7.com Web:<https://www.carlislesyntec.com>.
 - 1. Elevate.
 - 2. Johns Manville.
 - 3. Requests for substitutions will be considered in accordance with provisions of Section 01 60 00.

2.02 SCOPE / APPLICATION

- A. Roof System: Provide a waterproof roof system, capable of withstanding uplift forces as specified in Design Criteria.
- B. Base Flashing: Provide a waterproof, fully adhered base flashing system at all penetrations, plane transitions and terminations.
- C. Insulation: Provide a roof insulation system beneath the finish membrane.

2.03 AIR AND VAPOR BARRIER

- A. VapAir Seal 725TR Air/Vapor Barrier: A 40-mil composite consisting of 35-mils of self-adhering rubberized asphalt laminated to a 5-mil woven polypropylene film.

2.04 INSULATION

- A. Polyisocyanurate InsulBase: Carlisle InsulBase. Rigid board with glass fiber reinforced facers (GRF) on both sides, meeting or exceeding the requirements of ASTM C 1289, Type II, Class 1.
 - 1. Compressive Strength: Grade 2 (20 psi) (138 kPa).
 - 2. Density: 2 lb per cubic foot (24 kg/cu m) minimum.
- B. SecurShield HD Polyiso Cover board: Rigid board with coated glass fiber mat facers (CGF) on both sides, meeting or exceeding the requirements of ASTM C 1289, Type II, Class 4, Grade 1.
 - 1. Compressive Strength: 80 psi min. (751 kPa).
 - 2. Board Thickness: 1/2 inch (13 mm).

2.05 ETHYLENE, PROPYLENE, DIENE TERPOLYMER (EPDM) MEMBRANE

- A. Sure-Seal Non-Reinforced Membrane: Cured, non-reinforced EPDM membrane meeting the requirements of ASTM D 4637 Type with Factory Applied Seam Tape
 - 1. Attachment Method: Fully adhered.
 - 2. Color: Black.
 - 3. Membrane Thickness: 90 mil nominal 30 year base bid
 - 4. Membrane Thickness: 60 mil nominal 20 year alternate bid
 - 5. Sheet Dimensions:
 - a. Width: 10 feet (3.05 m) maximum.
 - b. Length: 100 feet (30.5 m) maximum.
 - 6. Performance:
 - a. Tensile Strength: 1550 psi (10.7 MPa) minimum.
 - b. Tear Resistance: 200 lbf/in (35 kN/m) minimum.
 - c. Elongation: 480 percent.

2.06 FLASHING ACCESSORIES

- A. Sure-Seal (black) Pressure-Sensitive Pipe Seals with Factory-Applied TAPE on the deck flange are available for use with Sure-Seal/Sure-White Roofing systems.
- B. Sure-Seal Pressure-Sensitive Pourable Sealer Pocket: Pre-fabricated Pourable Sealer Pocket consisting of a 2 inch (51 mm) wide plastic support strip with Pressure-Sensitive, Factory-Applied, adhesive backed uncured Elastoform Flashing.
- C. Sure-Seal Pressure-Sensitive (PS) Inside/Outside Corner: A 7 inch by 9 inch precut 60-mil thick Elastoform Flashing with a 30-mil Factory-Applied TAPE.
- D. Sure-Seal Pressure-Sensitive (PS) Curb Flashing - A 60-mil thick, 20 inch (508 mm) wide cured EPDM membrane with 5 inch (126 mm) wide Factory-Applied Pressure-Sensitive TAPE along one edge to be used to flash curbs/skylights, etc.

- E. Sure-Seal Pressure-Sensitive Overlayment Strip: A nominal 40-mil black, semi-cured EPDM membrane laminated to a nominal 35-mil cured, Factory-Applied TAPE for flashing gravel stops, metal edgings and Seam Fastening Plates.

2.07 CLEANERS, PRIMERS, ADHESIVES AND SEALANTS

- A. Carlisle Weathered Membrane Cleaner: Clear, solvent-based cleaner used to loosen and remove contaminants from the surface of exposed EPDM membrane prior to applying EPDM Primer.
- B. Sure-Seal SecurTAPE: 6 inch (152 mm) wide by 100 foot (30.5 M) long splice tape used for splicing adjoining sections of EPDM membrane.
- C. Sure-Seal HP-250 Primer: A solvent-based primer used to prepare the surface of EPDM membrane for application of Splice Tape or Pressure-Sensitive products.
- D. CAV-GRIP III Low-VOC Aerosol Contact Adhesive/Primer: a low-VOC, methylene chloride-free adhesive. that can be used adhering Sure-Seal EPDM, horizontally, for the field of the roof, and for adhering Sure-Seal EPDM membrane to vertical walls. Coverage rate is approximately 2,000-2,500 sq. ft. per 40 lb cylinder and 4,000-5,000 sq. ft. per 85 lb cylinder as a primer, in a single-sided application and 750 sq. ft. per 40 lb cylinder and 1,500 sq. ft. per 85 lb cylinder as an adhesive for vertical walls, in a double-sided application; 1,000 sq. ft. per 40 lb cylinder and 2,000 sq. ft. per 85 lb cylinder as an adhesive, horizontally, for the field of the roof, in a double-sided application.

2.08 FASTENING COMPONENTS

- A. InsulFast Fasteners: Threaded, #12 fastener with #3 Phillips head used with 3 inch (76 mm) diameter Insulation Plates. For insulation attachment into steel or wood decks.
- B. Insulation Fastening Plate: Nominal 3 inch (76 mm) diameter FM approved metal plate used for insulation attachment.

2.09 EDGINGS AND TERMINATIONS

- A. SecurEdge 200: A snap-on edge system consisting of a 24-gauge galvanized metal water dam. Finish as noted on the Finish Schedule of the Contract Drawings.

2.10 PRESSURE-SENSITIVE MOLDED WALKWAY PADS

- A. Basis of Design: Geotough EPDM – Pressure Sensitive Molded Walkway Pads
 - 1. Pad Thickness: 0.182"
 - 2. Pad Size: 30" x 30"
 - 3. Tensile Strength: 500 PSI

EXECUTION

3.01 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.02 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
- C. Do not commence work until all other work trades have completed jobs that require them to traverse the deck on foot or with equipment.
- D. A vapor retarder / temporary roof Carlisle VapAir Seal 725TR Air & Vapor Barrier/Temporary Roof may be applied to protect the inside of the structure prior to the roof system installation.

3.03 INSULATION - SYSTEM DESIGN

- A. Base Layer:
 - 1. Type: Polyiso.
 - 2. Thickness: 3 inches.
 - 3. Attachment Method: Mechanical.
- B. Top Layer:
 - 1. Type: Polyiso.
 - 2. Thickness: 3 inches.
 - 3. Attachment Method: Mechanical.
- C. Tapered System:
 - 1. Type: Tapered Poly-Iso
 - 2. Field Slope: ____ inch per foot.
 - 3. Sump Slope: ____ inch per foot.
 - 4. Cricket Slope: ____ inch per foot.
 - 5. Attachment Method: Mechanical.
- D. Cover Board:
 - 1. Type: High Density Polyiso.
 - 2. Attachment Method: Mechanical.

3.04 INSULATION PLACEMENT

- A. Install insulation or membrane underlayment in multiple layers over the substrate with boards butted tightly together with no joints or gaps greater than 1/4 inch (6 mm). Stagger joints both horizontally and vertically.
- B. Secure insulation to the substrate with the required mechanical fasteners or insulation adhesive in accordance with the manufacturer's current application guidelines.
- C. Do not install wet, damaged or warped insulation boards.
- D. Stagger joints in one direction unless joints are to be taped. Install insulation boards snug. Gaps between board joints shall not exceed 1/4 inch (6 mm). Fill all gaps in excess of 1/4 inch (6 mm) with same insulation material.
- E. Wood nailers must be at least 3 1/2 inches (89 mm) wide or 1 inch (25 mm) wider than adjacent metal flange. Thickness must equal that of insulation but not less than 1 inch (25 mm) thickness.
- F. Miter and fill the edges of the insulation boards at ridges, valleys and other changes in plane to prevent open joints or irregular surfaces. Avoid breaking or crushing of the insulation at the corners.
- G. Do not install any more insulation than will be completely waterproofed each day.

3.05 INSULATION ATTACHMENT

- A. Securely attach insulation to the roof deck for Mechanically Fastened Roofing Systems. Attachment must have been successfully tested to meet or exceed the calculated uplift pressure required by the International Building Code (ASCE-7).

3.06 MEMBRANE PLACEMENT AND ATTACHMENT (Fully Adhered)

- A. Unroll and position membrane without stretching. Allow the membrane to relax for approximately 1/2 hour before bonding. Fold the sheet back onto itself so half the underside of the membrane is exposed.
- B. Apply the Bonding Adhesive in accordance with the manufacturer's published instructions, to both the underside of the membrane and the substrate. Allow the adhesive to dry until it is tacky but will not string or stick to a dry finger touch.
- C. Roll the coated membrane into the coated substrate while avoiding wrinkles. Brush down the bonded half of the membrane sheet with a soft bristle push broom to achieve maximum contact.
- D. Fold back the unbonded half of the membrane sheet and repeat the bonding procedure.
- E. Install adjoining membrane sheets in the same manner, overlapping edges appropriately to provide for the minimum splice width. It is recommended that all splices be shingled to avoid bucking of water.

3.07 MEMBRANE SPLICING (Tape Splice)

- A. Overlap adjacent sheets and mark a line 1/2 inch out from the top sheet.
- B. Fold the top sheet back and clean the dry splice area (minimum 2 1/2 inches (64 mm wide) of both membrane sheets with Sure-Seal Primer as required by the membrane manufacturer.
- C. Where Splice Tape is not Factory-Applied, apply Splice Tape to bottom sheet with the edge of the release film along the marked line. Press tape onto the sheet using hand pressure. Overlap tape roll ends a minimum of 1 inch (13 mm).
- D. Remove the release film and press the top sheet onto the tape using hand pressure.
- E. Roll the seam toward the splice edge with a 2 inch (51 mm) wide steel roller.
- F. Install Pressure-Sensitive "T" Joint Cover, a 6 inch wide (152 mm) section of Pressure-Sensitive Elastoform Flashing over all field splice intersections.
- G. When using non-Pressure-Sensitive Elastoform Flashing or Elastoform Flashing, seal edges of flashing with Lap Sealant.
- H. The use of Lap Sealant with tape splices is optional except at tape overlaps and cut edges of reinforced membrane where Lap Sealant is required.

3.08 FLASHING

- A. Wall and curb flashing shall be cured EPDM membrane. Continue the deck membrane as wall flashing where practicable.
- B. Follow manufacturer's typical flashing procedures for all wall, curb, and penetration flashing including metal edging/coping and roof drain applications.

3.09 WALKWAYS

- A. Install walkways at all traffic concentration points (such as roof hatches, access doors, rooftop ladders, etc.) and all locations as identified on the Contract Drawings.
- B. Adhere walkways pads to the EPDM membrane in accordance with the manufacturer's current application guidelines.

3.10 DAILY SEALS

- A. On phased roofing, when the completion of flashings and terminations is not achieved by the end of the work day, a daily seal must be performed to temporarily close the membrane to prevent water infiltration.
- B. Use Sure-Seal Pourable Sealer or other acceptable membrane seal in accordance with the manufacturer's requirements.

3.11 CLEAN UP

- A. Perform daily clean-up to collect all wrappings, empty containers, paper, and other debris from the project site. Upon completion, all debris must be disposed of in a legally acceptable manner.
- B. Prior to the manufacturer's inspection for warranty, the applicator must perform a pre-inspection to review all work and to verify all flashing has been completed as well as the application of all caulking.

3.12 PROTECTION

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

END OF SECTION

SECTION 076200 - SHEET METAL FLASHING AND TRIM

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Fabricated sheet metal items, including flashings, counterflashings, exterior penetrations, and other items indicated in Schedule.
- B. Sealants for joints within sheet metal fabrications.

1.02 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. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2025.
- C. ASTM A755/A755M - Standard Specification for Steel Sheet, Metallic Coated by the Hot-Dip Process and Prepainted by the Coil-Coating Process for Exterior Exposed Building Products; 2018.
- 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 (Reapproved 2024).
- F. ASTM D4586/D4586M - Standard Specification for Asphalt Roof Cement, Asbestos-Free; 2007 (Reapproved 2024).
- G. CDA A4050 - Copper in Architecture - Handbook; Current Edition.
- H. SMACNA (ASMM) - Architectural Sheet Metal Manual; 2012.

1.03 SUBMITTALS

- A. See Section 013000 - Administrative Requirements for submittal procedures.
- B. Shop Drawings: Indicate material profile, jointing pattern, jointing details, fastening methods, flashings, terminations, and installation details.

1.04 QUALITY ASSURANCE

- A. Perform work in accordance with SMACNA (ASMM) and CDA A4050 requirements and standard details, except as otherwise indicated.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Stack material to prevent twisting, bending, and abrasion, and to provide ventilation. Slope metal sheets to ensure drainage.
- B. Prevent contact with materials that could cause discoloration or staining.

1.06 PERFORMANCE REQUIREMENTS

- A. General: Sheet metal flashing and trim assemblies as indicated shall withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Completed sheet metal flashing and trim shall not rattle, leak, or loosen, and shall remain watertight.
 - 1. Fabricate and install roof edge flashing and copings capable of resisting the following forces according to recommendations in FMG Loss Prevention Data Sheet 1-49:
 - 2. Wind Zone 3: For velocity pressures of 46 to 104 lbf/sq. ft. (2.20 to 4.98 kPa): 208-lbf/sq. ft. (9.96- kPa) perimeter uplift force, 312-lbf/sq. ft. (14.94-kPa) corner uplift force, and 104-lbf/sq. ft. (4.98- kPa) outward force.
 - 3. Thermal Movements: Provide sheet metal flashing and trim that allows for thermal movements from ambient and surface temperature changes.
- B. Temperature Change (Range): 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Sheet Metal Flashing and Trim:
 - 1. ALUCOBOND by 3A Composites USA; ALUCOBOND AXCENT: www.alucobondusa.com/#sle.
 - 2. Fairview Architectural LLC; edgeline: www.fairview-na.com/#sle.
 - 3. Hickman Edge Systems: www.hickmanedgesystems.com/#sle.
 - 4. Petersen Aluminum Corporation: www.pac-clad.com/#sle.
 - 5. Soprema, Inc; SENTINEL VCM: www.soprema.us/#sle.
 - 6. Tamlyn; XtremeColor Flashing: www.tamlyn.com/#sle.
 - 7. Taylor Metal Products: www.taylormetal.com/#sle.
 - 8. Substitutions: See Section 016000 - Product Requirements.

2.02 SHEET MATERIALS

- A. General: Protect mechanical and other finishes on exposed surfaces from damage by applying a strippable, temporary protective film before shipping.

- B. Aluminum Sheet: ASTM B 209 (ASTM B 209M), alloy as standard with manufacturer for finish required, with temper as required to suit forming operations and performance required.
1. Surface: Smooth, flat.
 2. Clear Anodic Finish Coil Coated: AAMA 611, AA-M12C22A41, Class I, 0.018 mm or thicker.
 3. Exposed Coil-Coated Finishes:
 - a. Three-Coat Fluoropolymer: AAMA 620. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in both color coat and clear topcoat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
 - 1) Color: As selected by Architect from manufacturer's full range.
 - 2) Concealed Finish: Pretreat with manufacturer's standard white or light-colored acrylic or polyester backer finish, consisting of prime coat and wash coat with a minimum total dry film thickness of 0.5 mil (0.013 mm).
- C. Metallic-Coated Steel Sheet: Restricted flatness steel sheet, metallic coated by the hot-dip process and preprinted by the coil-coating process to comply with ASTM A 755/A 755M.
1. Zinc-Coated (Galvanized) Steel Sheet: ASTM A 653/A 653M, G90 (Z275) coating designation; structural quality.
 2. Surface: Smooth, flat.
 3. Exposed Coil-Coated Finish:
 - a. Three-Coat Fluoropolymer: AAMA 621. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in both color coat and clear topcoat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
 4. Color: As selected by Architect from manufacturer's full range.
 5. Concealed Finish: Pretreat with manufacturer's standard white or light-colored acrylic or polyester backer finish, consisting of prime coat and wash coat with a minimum total dry film thickness of 0.5 mil (0.013 mm).

2.03 UNDERLAYMENT MATERIALS

- A. Felt: ASTM D 226, Type II (No. 30), asphalt-saturated organic felt, nonperforated.

2.04 MISCELLANEOUS MATERIALS

- A. General: Provide materials and types of fasteners, solder, welding rods, protective coatings, separators, sealants, and other miscellaneous items as required for complete sheet metal

flashing and trim installation and recommended by manufacturer of primary sheet metal or manufactured item unless otherwise indicated.

- B. Fasteners: Wood screws, annular threaded nails, self-tapping screws, self-locking rivets and bolts, and other suitable fasteners designed to withstand design loads and recommended by manufacturer of primary sheet metal or manufactured item.
 - 1. General: Blind fasteners or self-drilling screws, gasketed, with hex-washer head.
 - a. Exposed Fasteners: Heads matching color of sheet metal using plastic caps or factory-applied coating.
 - b. Blind Fasteners: High-strength aluminum or stainless-steel rivets suitable for metal being fastened.
 - c. Spikes and Ferrules: Same material as gutter; with spike with ferrule matching internal gutter width.
 - 2. Fasteners for Aluminum Sheet: Aluminum or Series 300 stainless steel.
 - 3. Fasteners for Zinc-Coated (Galvanized) Steel Sheet: Hot-dip galvanized steel according to ASTM A 153/A 153M or ASTM F 2329 or Series 300 stainless steel.
- C. Solder:
 - 1. For Zinc-Coated (Galvanized) Steel: ASTM B 32, Grade Sn50, 50 percent tin and 50 percent lead or Grade Sn60, 60 percent tin and 40 percent lead.
- D. Sealant Tape: Pressure-sensitive, 100 percent solids, gray polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape 1/2 inch (13 mm) wide and 1/8 inch (3 mm) thick.
- E. Elastomeric Sealant: ASTM C 920, elastomeric polysulfide polymer sealant; low modulus; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and trim and remain watertight.
- F. Butyl Sealant: ASTM C 1311, single-component, solvent-release butyl rubber sealant; polyisobutylene plasticized; heavy bodied for hooked-type expansion joints with limited movement.
- G. Epoxy Seam Sealer: Two-part, noncorrosive, aluminum seam-cementing compound, recommended by aluminum manufacturer for exterior nonmoving joints, including riveted joints.
- H. Bituminous Coating: Cold-applied asphalt emulsion complying with ASTM D 1187.
- I. Asphalt Roofing Cement: ASTM D 4586, asbestos free, of consistency required for application.

2.05 MANUFACTURED SHEET METAL FLASHING AND TRIM

- A. Reglets: Units of type, material, and profile indicated, formed to provide secure interlocking of separate reglet and counterflashing pieces, and compatible with flashing indicated with factory-mitered and -welded corners and junctions with interlocking counterflashing on exterior face, of same metal as reglet.
 - 1. Manufacturers: Subject to compliance with requirements,
 - a. Cheney Flashing Company.
 - b. Fry Reglet Corporation.
 - c. Heckmann Building Products Inc.

- d. Hickman, W. P. Company.
- e. Hohmann & Barnard, Inc.; STF Sawtooth Flashing.
- f. Keystone Flashing Company, Inc.
- g. National Sheet Metal Systems, Inc.
- h. Sandell Manufacturing Company, Inc.
- 2. Material: Galvanized steel, 0.022 inch (0.56 mm) thick.
- 3. Surface-Mounted Type: Provide with slotted holes for fastening to substrate, with neoprene or other suitable weatherproofing washers, and with channel for sealant at top edge.
- 4. Accessories:
 - a. Flexible-Flashing Retainer: Provide resilient plastic or rubber accessory to secure flexible flashing in reglet where clearance does not permit use of standard metal counterflashing or where Drawings show reglet without metal counterflashing.
 - b. Counterflashing Wind-Restraint Clips: Provide clips to be installed before counterflashing to prevent wind uplift of counterflashing lower edge.
- 5. Finish: With manufacturer's standard color coating.

2.06 FABRICATION, GENERAL

- A. General: Custom fabricate sheet metal flashing and trim to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, geometry, metal thickness, and other characteristics of item indicated. Fabricate items at the shop to greatest extent possible.
 - 1. Fabricate sheet metal flashing and trim in thickness or weight needed to comply with performance requirements, but not less than that specified for each application and metal.
 - 2. Obtain field measurements for accurate fit before shop fabrication.
 - 3. Form sheet metal flashing and trim without excessive oil canning, buckling, and tool marks and true to line and levels indicated, with exposed edges folded back to form hems.
 - 4. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces exposed to view.
- B. Fabrication Tolerances: Fabricate sheet metal flashing and trim that is capable of installation to a tolerance of 1/4 inch in 20 feet (6 mm in 6 m) on slope and location lines as indicated and within 1/8-inch (3-mm) offset of adjoining faces and of alignment of matching profiles.
- C. Fabrication Tolerances: Fabricate sheet metal flashing and trim that is capable of installation to tolerances specified in MCA's "Guide Specification for Residential Metal Roofing."
- D. Sealed Joints: Form nonexpansion but movable joints in metal to accommodate elastomeric sealant.
- E. Expansion Provisions: Where lapped expansion provisions cannot be used, form expansion joints of intermeshing hooked flanges, not less than 1 inch (25 mm) deep, filled with butyl sealant concealed within joints.
- F. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal.

- G. Seams: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with elastomeric sealant unless otherwise recommended by sealant manufacturer for intended use. Rivet joints where necessary for strength.
- H. Seams for Aluminum: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with epoxy seam sealer. Rivet joints where necessary for strength.
 - 1. Do not use graphite pencils to mark metal surfaces.

2.07 LOW-SLOPE ROOF SHEET METAL FABRICATIONS

- A. Roof-Edge Flashing (Gravel Stop) and Fascia Cap: Fabricate in minimum 96-inch- (2400-mm-) long, but not exceeding 10-foot- (3-m-) long, sections. Furnish with 6-inch- (150-mm-) wide, joint cover plates.
 - 1. Joint Style: Butt, with 12-inch- (300-mm-) wide, concealed backup plate and 6-inch- (150-mm-) wide, exposed cover plates.
 - 2. Fabricate from the following materials:
 - a. Galvanized Steel: 0.028 inch (0.71 mm) thick.
 - b. SMACNA fig B.
- B. Copings: Fabricate in minimum 96-inch- (2400-mm-) long, but not exceeding 10-foot- (3-m-) long, sections. Fabricate joint plates of same thickness as copings. Furnish with continuous cleats to support edge of external leg and drill elongated holes for fasteners on interior leg. Miter corners, seal, and solder or weld watertight.
 - 1. Coping Profile: SMACNA figure designation as selected.
 - 2. Joint Style Butt, with 12-inch- (300-mm-) wide, concealed backup plate and 6-inch- (150-mm-) wide, exposed cover plates.
 - 3. Fabricate from the following materials:
 - a. Galvanized Steel: 0.040 inch (1.02 mm) thick.
 - 4. SMACNA fig A.
- C. Base Flashing: Fabricate from the following materials:
 - 1. Galvanized Steel: 0.028 inch (0.71 mm) thick.
- D. Counterflashing: Fabricate from the following materials:
 - 1. Galvanized Steel: 0.022 inch (0.56 mm) thick.
 - 2. Similar to SMACNA fig B
- E. Roof-Penetration Flashing: Fabricate from the following materials:
 - 1. Galvanized Steel: 0.028 inch (0.71 mm) thick.
 - 2. SMACNA fig C

2.08 WALL SHEET METAL FABRICATIONS

- A. Metal Flashing: Provide metal flashing complying with SMACNA's "Architectural Sheet Metal Manual" and as follows:
 - 1. Stainless Steel: ASTM A 240/A 240M or ASTM A 666, Type 304, 0.016 inch thick.
 - 2. Fabricate continuous flashings in sections 96 inches long minimum, but not exceeding 12 feet. Provide splice plates at joints of formed, smooth metal flashing.

3. Fabricate through-wall flashing with drip edge unless otherwise indicated. Fabricate by extending flashing 1.2 inch out from wall, with outer edge bent down 30 degrees and hemmed.
 4. Fabricate metal drip edges from stainless steel. Extend at least 3 inches into wall and ½" out from wall, with outer edge bent down 30 degrees and hemmed.
 5. Fabricate metal expansion joint strips from stainless steel to shapes indicated.
 6. Solder metal items at corners.
- B. Application: Unless otherwise indicated, use the following:
1. Where flashing is indicated to receive counterflashing, use metal flashing.
 2. Where flashing is indicated to be turned down at or beyond the wall face, use metal flashing.
 3. Where flashing is partly exposed and is indicated to terminate at the wall face, use metal flashing with a drip edge.
 4. Where flashing is fully concealed, use metal flashing.
- C. Solder and Sealants for Sheet Metal Flashings:
1. Solder for Stainless Steel: ASTM B 32, Grade Sn60, with acid flux of type recommended by stainless steel manufacturer.
 2. Elastomeric Sealant: Refer to Section 079200 "Joint Sealants"
- D. Adhesives, Primers, and Seam Tapes for Flashings: Flashing manufacturer's standard products or products recommended by flashing manufacturer for bonding flashing sheets to each other and to substrates.

2.09 ROOF DRAINAGE SHEET METAL FABRICATIONS

- A. Through-Wall Overflow Scupper: Fabricate to cross section indicated, complete with end pieces and other accessories as required.
1. Enclosed four-sided rectangular sheet metal sleeve cut to match total thickness of the finished parapet wall structure.
 2. Fabricate from the following materials:
 - a. Galvanized Steel: 0.028 inch thick. (24 gauge)
 - b. SMACNA fig 1-30.
 3. Finish: Color as selected by Architect

2.10 ACCESSORIES

- A. Fasteners: Galvanized steel, with soft neoprene washers.
- B. Primer Type: Zinc chromate.
- C. Concealed Sealants: Non-curing butyl sealant.
- D. Exposed Sealants: ASTM C920; elastomeric sealant, with minimum movement capability as recommended by manufacturer for substrates to be sealed; color to match adjacent material.
- E. 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 INSTALLATION

- A. Secure flashings in place using concealed fasteners, and use exposed fasteners only where permitted.
- B. Apply plastic cement compound between metal flashings and felt flashings.
- C. Fit flashings tight in place; make corners square, surfaces true and straight in planes, and lines accurate to profiles.
- D. Seal metal joints watertight.

3.03 FIELD QUALITY CONTROL

- A. See Section 014000 - Quality Requirements for field inspection requirements.
- B. Inspection will involve surveillance of work during installation to ascertain compliance with specified requirements.

END OF SECTION

SECTION 077100 - ROOF SPECIALTIES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Manufactured roof specialties, including copings and fascias.
- B. Roof control and expansion joint covers.

1.02 RELATED REQUIREMENTS

- A. Section 077200 - Roof Accessories: Manufactured curbs.

1.03 REFERENCE STANDARDS

- A. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix); 2022.
- B. ANSI/SPRI/FM 4435/ES-1 - Test Standard for Edge Systems Used with Low Slope Roofing Systems; 2022.
- C. NRCA (RM) - The NRCA Roofing Manual; 2025.

1.04 SUBMITTALS

- A. See Section 013000 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide data on shape of components, materials and finishes, anchor types and locations.
- C. Shop Drawings: Indicate configuration and dimension of components, adjacent construction, required clearances and tolerances, and other affected work.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Roof Edge Flashings and Copings:
 - 1. Architectural Products Co: www.archprod.com/#sle.
 - 2. ATAS International, Inc; Rapid-Lok Fascia: www.atas.com/#sle.
 - 3. Drexel Metals Inc: www.drexmet.com/#sle.
 - 4. Hickman Edge Systems: www.hickmanedgesystems.com/#sle.
 - 5. Metal-Era Inc: www.metalera.com/#sle.
 - 6. Metal Roofing Systems, Inc; Rapid Lock Coping: www.metalroofingsystems.biz/#sle.
- B. Control and Expansion Joint Covers:

1. Balco.
2. Substitutions: See Section 016000 - Product Requirements.
- C. Pipe and Penetration Flashings:
 1. Elmdor: www.elmdor.com/#sle.
 2. Substitutions: See Section 016000 - Product Requirements.
- D. Counterflashings:
 1. ATAS International, Inc: www.atas.com/#sle.
 2. Hickman Edge Systems: www.hickmanedgesystems.com/#sle.
 3. Metal-Era Inc: www.metalera.com/#sle.
 4. Substitutions: See Section 016000 - Product Requirements.

2.02 COMPONENTS

- A. Roof Edge Flashings: Factory fabricated to sizes required; corners mitered; concealed fasteners.
 1. Configuration: Fascia, cant, and edge securement for roof membrane.
 2. Pull-Off Resistance: Tested in accordance with ANSI/SPRI/FM 4435/ES-1 using test methods RE-1 and RE-2 to positive and negative design wind pressure as defined by applicable local building code.
 3. Exposed Face Height: As indicated on drawings.
 4. Material: Formed steel sheet, galvanized, 24 gauge, 0.024 inch (0.6 mm) thick, minimum.
 5. Color: As selected by Architect from manufacturer's full range.
- B. Copings: Factory fabricated to sizes required; corners mitered; concealed fasteners.
 1. Configuration: Concealed continuous hold down cleat at both legs; internal splice piece at joints of same material, thickness, and finish as cap; concealed stainless steel fasteners.
 2. Pull-Off Resistance: Tested in accordance with ANSI/SPRI/FM 4435/ES-1 using test method RE-3 to positive and negative design wind pressure as defined by applicable local building code.
 3. Wall Width: As indicated on drawings.
 4. Inside Face Height: As indicated on drawings.
 5. Material: Formed steel sheet, galvanized, 24 gauge, 0.024 inch (0.6 mm) thick, minimum.
 6. Finish: 70 percent polyvinylidene fluoride.
 7. Color: As selected by Architect from manufacturer's full range.
- C. Expansion Joint Covers: Roof-to-roof joint cover comprised of bellows type EPDM standard elastomeric bellows, closed cell foam backer and integral splicing.
 1. Fasteners: Concealed. Factory-punched fastener holes.
- D. Pipe and Penetration Flashing: Base of rounded aluminum, compatible with sheet metal roof systems, and capable of accommodating pipes sized between 3/8 inch (9.5 mm) and 12 inches (305 mm).
 1. Caps: EPDM.
- E. Counterflashings: Factory fabricated and finished sheet metal that overlaps top edges of base flashing by at least 4 inches (102 mm), and designed to snap into through-wall flashing or reglets with lapped joints.
 1. Material: Zinc-coated steel sheet, 0.022 inch (0.56 mm) thick, minimum.
 2. Color: To be selected by Architect from manufacturer's full range.

2.03 FINISHES

- A. PVDF (Polyvinylidene Fluoride) Coating: Superior Performance Organic Finish, AAMA 2605; multiple coat, thermally cured fluoropolymer finish system; color as selected from manufacturer's standard colors.

2.04 ACCESSORIES

- A. Sealant for Joints in Linear Components: As recommended by component manufacturer.
- B. Adhesive for Anchoring to Roof Membrane: Compatible with roof membrane and approved by roof membrane manufacturer.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that deck, curbs, roof membrane, base flashing, and other items affecting work of this Section are in place and positioned correctly.
 - 1. See Section 077200 for information on roofing related accessories.

3.02 INSTALLATION

- A. Install components in accordance with manufacturer's instructions and NRCA (RM) applicable requirements.
- B. Seal joints within components when required by component manufacturer.
- C. Anchor components securely.
- D. Coordinate installation of components of this section with installation of roofing membrane and base flashings.
- E. Coordinate installation of sealants and roofing cement with work of this section to ensure water tightness.
- F. Coordinate installation of flashing flanges into reglets.

END OF SECTION

SECTION 077200 - ROOF ACCESSORIES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Roof curbs.
- B. Roof penetrations mounting curbs.
- C. Roof hatches.
- D. Roof hatches with ship ladders.
- E. Parapet Ladders.
- F. Smoke Roof Vent

1.02 RELATED REQUIREMENTS

- A. Section 077100 - Roof Specialties: Other manufactured roof specialty items.

1.03 SUBMITTALS

- A. See Section 013000 - Administrative Requirements for submittal procedures.
- B. Shop Drawings: Submit detailed layout developed for this project and provide dimensioned location and number for each type of roof accessory.
- C. Warranty Documentation:
 - 1. Submit manufacturer warranty.
 - 2. Ensure that forms have been completed in Owner's name and registered with manufacturer.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's unopened packaging until ready for installation.
- B. Store products under cover and elevated above grade.

1.05 WARRANTY

- A. See Section 017800 - Closeout Submittals for additional warranty requirements.

PART 2 PRODUCTS

2.01 ROOF CURBS

- A. Roof Curbs Manufacturers:
 - 1. Active Ventilation Products, Inc; Insulated Roof Curbs: www.roofvents.com/#sle.
 - 2. AES Industries Inc: www.aescurb.com/#sle.

3. The Pate Company; _____: www.patecurbs.com/#sle.
 4. LMCurbs; Roof Curbs: www.lmcurbs.com/#sle.
 5. Substitutions: See Section 016000 - Product Requirements.
- B. Roof Curbs Mounting Assemblies: Factory fabricated hollow sheet metal construction, internally reinforced, and capable of supporting superimposed live and dead loads and designated equipment load with fully mitered and sealed corner joints welded or mechanically fastened, and integral counterflashing with top and edges formed to shed water.
1. Roof Curb Mounting Substrate: Curb substrate consists of standing seam metal roof panel system.
 2. Sheet Metal Material:
 - a. Aluminum: 0.080 inch (2.03 mm) minimum thickness, with 3003 alloy, and H14 temper.
 3. Fabricate curb bottom and mounting flanges for installation directly on metal roof panel system to match slope and configuration of system.
 - a. Extend side flange to next adjacent roof panel seam and comply with seam configurations and seal connection, providing at least 6 inch (152 mm) clearance between curb and metal roof panel flange allowing water to properly flow past curb.
 - b. Where side of curb aligns with metal roof panel flange, attach fasteners on upper slope of flange to curb connection allowing water to flow past below fasteners, and seal connection.
 - c. Maintain at least 12 inch (305 mm) clearance from curb, and lap upper curb flange on underside of down sloping metal roof panel, and seal connection.
 - d. Lap lower curb flange overtop of down sloping metal roof panel and seal connection.

2.02 ROOF HATCHES

- A. Roof Hatches: Fabricate roof hatches with insulated double-wall lids and insulated double-wall curb frame with integral deck mounting flange and lid frame counterflashing. Fabricate with welded or mechanically fastened and sealed corner joints. Provide continuous weathertight perimeter gasketing and equip with corrosion-resistant or hot-dip galvanized hardware.
1. Manufacturers:
 - a. Babcock-Davis; a Cierra Products Inc. Company.
 - b. Bilco Company (The).
 - c. Bristolite Skylights.
 - d. Custom Curb, Inc.
 - e. Dur-Red Products.
 - f. Hi Pro International, Inc.
 - g. J. L. Industries, Inc.
 - h. Metallic Products Corporation.
 - i. Milcor Inc.; a Gibraltar Company.
 - j. Nystrom, Inc.
 - k. **O'Keeffe's Inc. – Basis of Design**
 - l. Precision Ladders, LLC.
 - m. Roof Products & Systems Corporation.
 - n. ThyCurb; Div of Thybar Corporation.
 - o. Wasco Products, Inc.

- p. Western Canwell.
- 2. Loads: Fabricate roof hatches to withstand external and internal loads based on Wind Criteria stated on Structural Drawings.
- 3. Type and Size: Single-leaf lid, 30" by 54" inches.
- 4. Curb and Lid Material: Galvanized steel sheet 0.079 inch thick.
- 5. Insulation: Polyisocyanurate board.
- 6. Interior Lid Liner: Manufacturer's standard metal liner of same material and finish as outer metal lid.
- 7. Exterior Curb Liner: Manufacturer's standard metal liner of same material and finish as metal curb.
- 8. On ribbed or fluted metal roofs, form flange at perimeter bottom to conform to roof profile.
- 9. Fabricate units to minimum height of 12 inches unless otherwise indicated.
- 10. Sloping Roofs: Where slope or roof deck exceeds 1:48, fabricate hatch curbs with height constant.
- 11. Hardware: Stainless-steel spring latch with turn handles, butt- or pintle-type hinge system, and padlock hasps inside and outside.
- 12. Ladder Safety Post: Manufacturer's standard ladder safety post. Post to lock in place on full extension. Provide release mechanism to return post to closed position.
 - a. Test Load: manufacturer's standard test load.
 - b. Height: 42 inches above finished roof deck.
 - c. Material and Finish: Steel tube, galvanized.
 - d. Diameter: Pipe with 1-5/8-inch OD tube.

2.03 SHIP LADDERS

- A. General: Basis of Design: O'Keeffe's, Inc. Model # 523
 - 1. Space siderails 24 inches apart, unless otherwise indicated.
 - 2. Aluminum High Strength 6061-T6 Alloy Rungs & 6063-T5 alloy extrusions.
 - 3. 75 Degree Angle designed to work with Roof Hatch.
 - 4. Securely anchor to the building structure. Provide for all exterior ladders.

2.04 PARAPET LADDERS

- A. General: Basis of Design: O'Keefe's, Inc. Model # 503
 - 1. Tubular Rail High Parapet Access ladder with Platform and Return
 - 2. Aluminum High Strength 6061-T6 Alloy Rungs & 6063-T5 alloy extrusions.
 - 3. Finish: Standard Mill Finish

2.05 SMOKE ROOF VENT

- A. General: Basis of Design: Bilco DSH6096TB
 - 1. Thermally Broken Automatic Smoke Vent
 - 2. Fully Insulated and gasketed for weather-tightness.
 - 3. 12" Insulated Curb

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 PROTECTION

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

SECTION 078400 - 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 017000 - Execution and Closeout Requirements: Cutting and patching.

1.03 REFERENCE STANDARDS

- A. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials; 2024.
- B. ASTM E814 - Standard Test Method for Fire Tests of Penetration Firestop Systems; 2024.
- C. 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, with Editorial Revision (2024).
- D. ITS (DIR) - Directory of Listed Products; Current Edition.
- E. FM (AG) - FM Approval Guide; Current Edition.
- F. UL 1479 - Standard for Fire Tests of Penetration Firestops; Current Edition, Including All Revisions.
- G. UL (FRD) - Fire Resistance Directory; Current Edition.

1.04 SUBMITTALS

- A. See Section 013000 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide data on product characteristics, performance ratings, and limitations.

1.05 QUALITY ASSURANCE

- A. Fire Testing: Provide firestopping assemblies of designs that provide the scheduled fire ratings when tested in accordance with methods indicated.
 - 1. Listing in UL (FRD), FM (AG), or ITS (DIR) will be considered as constituting an acceptable test report.
 - 2. Valid evaluation report published by ICC Evaluation Service, Inc. (ICC-ES) at www.icc-es.org will be considered as constituting an acceptable test report.

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.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Firestopping Manufacturers:
 - 1. 3M Fire Protection Products: www.3m.com/firestop/#sle.
 - 2. A/D Fire Protection Systems Inc: www.adfire.com/#sle.
 - 3. CEMCO; HOTROD Type-X Compressible Firestopping: www.cemcosteel.com/#sle.
 - 4. Everkem Diversified Products, Inc; Intumescent Fire-Rated Putty Pads: www.everkemproducts.com/#sle.
 - 5. Hilti, Inc: www.hilti.com/#sle.
 - 6. Substitutions: See Section 016000 - Product Requirements.

2.02 MATERIALS

- A. Firestopping Materials: Any materials meeting requirements.
- B. Primers, Sleeves, Forms, Insulation, Packing, Stuffing, and Accessories: Provide type of materials as required for tested firestopping assembly.
- C. Fire Ratings: Refer to drawings for required systems and ratings.

2.03 FIRESTOPPING ASSEMBLY REQUIREMENTS

- A. 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.
- B. 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 FOR FLOOR-TO-FLOOR, FLOOR-TO-WALL, HEAD-OF-WALL, AND WALL-TO-WALL JOINTS

- A. Concrete and Concrete Masonry Walls and Floors:
 - 1. Head-of-Wall Joints at Concrete/Concrete Masonry Wall to Concrete Over Metal Deck Floor:
 - a. 2 Hour Construction: UL System HW-D-0039; Specified Technologies Inc. ES Elastomeric Firestop Sealant.
 - b. 2 Hour Construction: UL System HW-D-0058; RectorSeal MetaCaulk 1200 Spray.

- c. 2 Hour Construction: UL System HW-D-0149; RectorSeal MetaCaulk 150+.
- d. 2 Hour Construction: UL System HW-D-0181; Hilti CFS-SP WB Firestop Joint Spray and CP 672.
- e. 2 Hour Construction: UL System HW-D-1037; Hilti CFS-SP WB Firestop Joint Spray and CP 672.
- 2. Concrete/Concrete Masonry Wall-to-Wall Joint Systems That Have Movement Capabilities (Dynamic-D):
 - a. 2 Hour Construction: UL System WW-D-0025; RectorSeal MetaCaulk 1200 Spray.
 - b. 2 Hour Construction: UL System WW-D-0027; RectorSeal MetaCaulk 150+.
 - c. 2 Hour Construction: UL System WW-D-0110; RectorSeal MetaCaulk 150+.
 - d. 2 Hour Construction: UL System WW-D-1077; Tremco, TREMstop Acrylic Firestop Sealant.
 - e. 2 Hour Construction: UL System WW-D-0017; Hilti CFS-SP WB Firestop Joint Spray and CP 672.
 - f. 2 Hour Construction: UL System WW-D-0032; Hilti CP 606 Flexible Firestop Sealant.

2.05 FIRESTOPPING PENETRATIONS THROUGH CONCRETE AND CONCRETE

MASONRY CONSTRUCTION

A. Blank Openings:

- 1. In Floors or Walls:
 - a. 2 Hour Construction: UL System C-AJ-0090; Hilti FS-ONE MAX Intumescent Firestop Sealant.
 - b. 2 Hour Construction: UL System C-AJ-0015; Specified Technologies Inc. SSM Mortar.
 - c. 2 Hour Construction: UL System C-AJ-0116; Specified Technologies Inc. Composite Sheet.
 - d. 2 Hour Construction: UL System C-AJ-0136; Specified Technologies Inc. SSM Mortar.
 - e. 2 Hour Construction: UL System C-AJ-0171; HoldRite HydroFlame 100 Intumescent Firestop Sealant.

B. Penetrations Through Floors or Walls By:

- 1. Multiple Penetrations in Large Openings:
 - a. 2 Hour Construction: UL System C-AJ-2863; HoldRite HydroFlame 100 Intumescent Firestop Sealant.
 - b. 2 Hour Construction: UL System C-AJ-8143; Hilti FS-ONE MAX Intumescent Firestop Sealant.
 - c. 2 Hour Construction: UL System C-AJ-8035; Specified Technologies Inc. SSM Mortar.
 - d. 2 Hour Construction: UL System C-AJ-8042; RectorSeal MetaCaulk 1000.
 - e. 2 Hour Construction: UL System C-AJ-8055; Specified Technologies Inc. SSP Firestop Putty.
 - f. 2 Hour Construction: UL System C-AJ-8093; Specified Technologies Inc. SSB Intumescent Firestop Pillows.
 - g. 2 Hour Construction: UL System C-AJ-8114; Specified Technologies Inc. SSM Mortar.

- h. 2 Hour Construction: UL System C-AJ-8115; Specified Technologies Inc. SSM Mortar.
 - i. 2 Hour Construction: UL System C-AJ-8129; RectorSeal MetaCaulk 1200 Spray.
 - j. 2 Hour Construction: UL System C-AJ-8149; RectorSeal MetaCaulk 1000.
 - k. 2 Hour Construction: UL System C-AJ-8171; RectorSeal MetaCaulk Wrap Strip.
 - l. 2 Hour Construction: UL System C-AJ-8181; Specified Technologies Inc. Composite Sheet.
 - m. 2 Hour Construction: UL System C-AJ-8220; Specified Technologies Inc. SSM Mortar.
2. Uninsulated Metallic Pipe, Conduit, and Tubing:
- a. 2 Hour Construction: UL System C-AJ-1036; RectorSeal MetaCaulk 950.
 - b. 2 Hour Construction: UL System C-AJ-1090; Specified Technologies Inc. SSP Firestop Putty.
 - c. 2 Hour Construction: UL System C-AJ-1186; RectorSeal MetaCaulk 950.
 - d. 2 Hour Construction: UL System C-AJ-1198; Specified Technologies Inc. SIL Silicone Sealant.
 - e. 2 Hour Construction: UL System C-AJ-1226; Hilti FS-ONE MAX Intumescent Firestop Sealant.
 - f. 2 Hour Construction: UL System C-AJ-1240; Specified Technologies Inc. LC Endothermic Firestop Sealant.
 - g. 2 Hour Construction: UL System C-AJ-1425; Hilti CFS-S SIL GG Firestop Silicone Sealant Gun-Grade.
3. Uninsulated Non-Metallic Pipe, Conduit, and Tubing:
- a. 2 Hour Construction: UL System C-AJ-2047; RectorSeal MetaCaulk 1000.
 - b. 2 Hour Construction: UL System C-AJ-2167; Hilti FS-ONE MAX Intumescent Firestop Sealant.
 - c. 2 Hour Construction: UL System C-AJ-2109; Hilti CP 643N/644 Firestop Collar.
 - d. 2 Hour Construction: UL System C-AJ-2106; Specified Technologies Inc. SSW Wrap Strips.
 - e. 2 Hour Construction: UL System C-AJ-2282; Specified Technologies Inc. SSW Wrap Strips.
 - f. 2 Hour Construction: UL System C-AJ-2297; Specified Technologies Inc. SSC Collars.
 - g. 2 Hour Construction: UL System C-AJ-2297; Specified Technologies Inc. SSW Wrap Strips.
 - h. 2 Hour Construction: UL System C-AJ-2298; Specified Technologies Inc. LCC Intumescent Firestop Collars.
 - i. 2 Hour Construction: UL System C-AJ-2348; RectorSeal MetaCaulk 150+.
 - j. 2 Hour Construction: UL System C-AJ-2588; Specified Technologies Inc. RTC Range-Taking Collar.
 - k. 2 Hour Construction: UL System C-AJ-2707; RectorSeal MetaCaulk 1000.
 - l. 2 Hour Construction: UL System C-AJ-2772; Specified Technologies Inc. SSW Wrap Strips.
 - m. 2 Hour Construction: UL System C-BJ-2021; Hilti CP 643N Firestop Collar.
4. Electrical Cables Not In Conduit:
- a. 2 Hour Construction: UL System C-AJ-3213; Specified Technologies Inc. LCC Intumescent Firestop Collars.
 - b. 2 Hour Construction: UL System C-AJ-3213; Specified Technologies Inc. SSC Collars.

- c. 2 Hour Construction: UL System W-J-3046; Specified Technologies Inc. SSP Firestop Putty.
 - d. 2 Hour Construction: UL System C-AJ-3154; Specified Technologies Inc. SSP Firestop Putty.
 - e. 2 Hour Construction: UL System C-AJ-3216; Hilti CFS-PL Firestop Plug.
 - f. 2 Hour Construction: UL System C-AJ-3283; Hilti CP653 Speed Sleeve.
 - g. 2 Hour Construction: UL System C-AJ-3283; Hilti CFS-SL SK Firestop Sleeve Kit.
 - h. 2 Hour Construction: UL System C-AJ-3283; Hilti CFS-SL SK Firestop Sleeve Kit with Hilti CFS-SL GP Gangplate.
 - i. 2 Hour Construction: UL System W-J-3198; Hilti CFS-SL RK Retrofit Sleeve Kit for Existing Cables.
 - j. 2 Hour Construction: UL System W-J-3199; Hilti CFS-SL SK Firestop Sleeve Kit.
 - k. 2 Hour Construction: UL System F-A-3085, F-A-3087, F-A-3088, W-J-3277, W-J-3278, W-J-3279, W-L-3481, W-L-3482, W-L-3483, and W-L-3484.; Hilti CFS-MSL L Modular Sleeve.
5. Cable Trays with Electrical Cables:
- a. 2 Hour Construction: UL System C-AJ-4094; Hilti CFS-BL Firestop Block.
6. Insulated Pipes:
- a. 2 Hour Construction: UL System C-AJ-5048; Hilti FS-ONE MAX Intumescent Firestop Sealant, CP 606 Flexible Firestop Sealant, CP 601S Elastomeric Firestop Sealant, CP 604 Self-Leveling Firestop Sealant or CFS-S SIL GG Firestop Silicone Sealant Gun-Grade.
 - b. 2 Hour Construction: UL System C-AJ-5087; Specified Technologies Inc. SSS Intumescent Firestop Sealant.
 - c. 2 Hour Construction: UL System C-AJ-5091; Hilti FS-ONE IMAX Intumescent Firestop Sealant.
 - d. 2 Hour Construction: UL System C-AJ-5138; Specified Technologies Inc. LCI Intumescent Firestop Sealant.
 - e. 2 Hour Construction: UL System C-AJ-5313; Specified Technologies Inc. LC Endothermic Firestop Sealant.
7. HVAC Ducts, Uninsulated:
- a. 2 Hour Construction: UL System C-AJ-7111; Hilti FS-ONE MAX Intumescent Firestop Sealant.

2.06 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.
- B. Firestopping at Uninsulated Metallic Pipe and Conduit Penetrations, of diameter 4 inches (100 mm) or less: Caulk or putty.
- C. Firestopping at Combustible Pipe and Conduit Penetrations, of diameter 4 inches (100 mm) or less: Any material meeting requirements.
- D. Firestopping at Cable Tray Penetrations: Any material meeting requirements.

- E. Firestopping at Cable Penetrations, not in Conduit or Cable Tray: Caulk or putty.
- F. Firestopping at Control Joints (without Penetrations): Any material meeting requirements.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify openings are ready to receive the work of this section.

3.02 PREPARATION

- A. Clean substrate surfaces of dirt, dust, grease, oil, loose material, or other materials that could adversely affect bond of firestopping material.
- B. Remove incompatible materials that could adversely affect bond.

3.03 INSTALLATION

- A. Install materials in manner described in fire test report and in accordance with manufacturer's instructions, completely closing openings.

3.04 CLEANING

- A. Clean adjacent surfaces of firestopping materials.

3.05 PROTECTION

- A. Protect adjacent surfaces from damage by material installation.

END OF SECTION

SECTION 079200 - 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 REFERENCE STANDARDS

- A. ASTM C794 - Standard Test Method for Adhesion-in-Peel of Elastomeric Joint Sealants; 2018 (Reapproved 2022).
- B. ASTM C834 - Standard Specification for Latex Sealants; 2017 (Reapproved 2023).
- C. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2018 (Reapproved 2024).
- D. ASTM C1087 - Standard Test Method for Determining Compatibility of Liquid-Applied Sealants with Accessories Used in Structural Glazing Systems; 2023.
- E. ASTM C1193 - Standard Guide for Use of Joint Sealants; 2025.
- F. ASTM C1248 - Standard Test Method for Staining of Porous Substrate by Joint Sealants; 2022.

1.03 SUBMITTALS

- A. See Section 013000 - 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 that product is known to satisfactorily adhere to and with which it is compatible.
 - 4. Substrates the product should not be used on.
 - 5. Installation instructions, including precautions, limitations, and recommended backing materials and tools.
 - 6. Sample product warranty.
- C. Color Cards for Selection: Where sealant color is not specified, submit manufacturer's color cards showing standard colors available for selection.
- D. Preconstruction Laboratory Test Reports: Submit at least four weeks prior to start of installation.
- E. Executed warranty.

1.04 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.
- B. Preconstruction Laboratory Testing: Arrange for sealant manufacturer(s) to test each combination of sealant, substrate, backing, and accessories.
 - 1. Adhesion Testing: In accordance with ASTM C794.
 - 2. Compatibility Testing: In accordance with ASTM C1087.
 - 3. Allow sufficient time for testing to avoid delaying the work.
 - 4. Deliver sufficient samples to manufacturer for testing.
 - 5. Report manufacturer's recommended corrective measures, if any, including primers or techniques not indicated in product data submittals.

1.05 WARRANTY

- A. See Section 017800 - Closeout Submittals for additional warranty requirements.
- B. Manufacturer Warranty: Provide 2-year manufacturer warranty for installed sealants and accessories that fail to achieve a watertight seal, exhibit loss of adhesion or cohesion, or do not cure. Complete forms in Owner's name and register with manufacturer.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, products listed in other Part 2 articles.

2.02 MATERIALS, GENERAL

- A. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by sealant manufacturer, based on testing and field experience.

2.03 ELASTOMERIC JOINT SEALANTS

- A. Elastomeric Sealants: Comply with ASTM C 920 and other requirements indicated for each liquid-applied chemically curing sealant specified, including those referencing ASTM C 920 classifications for type, grade, class, and uses related to exposure and joint substrates.

- B. Stain-Test-Response Characteristics: Where elastomeric sealants are specified to be nonstaining to porous substrates, provide products that have undergone testing according to ASTM C 1248 and have not stained porous joint substrates indicated for Project.
- C. Suitability for Contact with Food: Where elastomeric sealants are indicated for joints that will come in repeated contact with food, provide products that comply with 21 CFR 177.2600.
- D. Multicomponent Nonsag Polysulfide Sealant ES-1:

- 1. Available Products:

- a. Pacific Polymers, Inc.; Elasto-Seal 227 Type II (Gun Grade).
- b. Pecora Corporation; Synthacalk GC-2+.
- c. Polymeric Systems Inc.; PSI-350.
- d. PolySpec Corp.; T-2235-M.
- e. PolySpec Corp.; T-2282.
- f. PolySpec Corp.; Thiokol 2P.
- g. Sonneborn, Division of ChemRex Inc.; Sonolastic Polysulfide Sealant.
 - 1) Type and Grade: M (multicomponent) and NS (nonsag).
 - 2) Class: 25.
 - 3) Use Related to Exposure: NT (nontraffic).
 - 4) Uses Related to Joint Substrates: M, G, A, and, as applicable to joint substrates indicated, O.
 - (a) Use O Joint Substrates: color anodic aluminum.

- E. Single-Component Neutral-Curing Silicone Sealant ES-2:

- 1. Available Products:

- a. Dow Corning Corporation; 790.
- b. GE Silicones; SilPruf LM SCS2700.
- c. Tremco; Spectrem 1 (Basic).
- d. Dow Corning Corporation; 791.
- e. Dow Corning Corporation; 795
- f. GE Silicones; SilPruf NB SCS9000.
- g. GE Silicones; UltraPruf II SCS2900.
- h. Pecora Corporation; 865.
- i. Pecora Corporation; 895.
- j. Pecora Corporation; 898.
- 2. Type and Grade: S (single component) and NS (nonsag).
- 3. Class: 100/50.
- 4. Use Related to Exposure: NT (nontraffic).
- 5. Uses Related to Joint Substrates: M, G, A, and, as applicable to joint substrates indicated, O.
 - a. Use O Joint Substrates: anodic aluminum, brick, solid surface sills.

6. Stain-Test-Response Characteristics: Non-staining to porous substrates per ASTM C 1248.

F. Single-Component Mildew-Resistant Neutral-Curing Silicone Sealant ES-3:

1. Available Products:
 - a. Pecora Corporation; 898.
 - b. Tremco; Tremsil 600 White.
2. Type and Grade: S (single component) and NS (nonsag).
3. Class: 25.
4. Use Related to Exposure: NT (nontraffic).
5. Uses Related to Joint Substrates: G, A, and, as applicable to joint substrates indicated, O.
 - a. Use O Joint Substrates: ceramic plumbing fixtures, gypsum board, plastic laminate.

G. Single-Component Nonsag Urethane Sealant ES-4:

1. Available Products:
 - a. Sika Corporation, Inc.; Sikaflex - 1a.
 - b. Sonneborn, Division of ChemRex Inc.; Ultra.
 - c. Sonneborn, Division of ChemRex Inc.; NP 1.
 - d. Tremco; Vulkem 116.
2. Type and Grade: S (single component) and NS (nonsag).
3. Class: 25.
4. Uses Related to Exposure: T (traffic) and NT (nontraffic).
5. Uses Related to Joint Substrates: M, A, and, as applicable to joint substrates indicated, O.
 - a. Use O Joint Substrates: Color anodic aluminum.

H. Single-Component Pourable Urethane Sealant ES-5:

1. Available Products:
 - a. Sika Corporation, Inc.; Sikaflex - 1CSL.
 - b. Sonneborn, Division of ChemRex Inc.; SL 1.
 - c. Tremco; Vulkem Nova 300 SSL.
2. Type and Grade: S (single component) and P (pourable).
3. Class: 25.
4. Uses Related to Exposure: T (traffic) and NT (nontraffic).
5. Uses Related to Joint Substrates: M, A, and, as applicable to joint substrates indicated, O.
 - a. Use O Joint Substrates: Concrete.

2.04 LATEX JOINT SEALANTS

A. Latex Sealant LS-1: Comply with ASTM C 834, Type P, Grade NF.

B. Available Products:

1. Bostik Findley; Chem-Calk 600.
2. Pecora Corporation; AC-20+.
3. Schnee-Morehead, Inc.; SM 8200.
4. Sonneborn, Division of ChemRex Inc.; Sonolac.
5. Tremco; Tremflex 834.

2.05 ACOUSTICAL JOINT SEALANTS

A. Acoustical Sealant for Exposed and Concealed Joints AS-1: Manufacturer's standard nonsag, paintable, nonstaining latex sealant complying with ASTM C 834 and the following:

1. Product effectively reduces airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E 90.
2. Available Products:
 - a. Pecora Corporation; AC-20 FTR Acoustical and Insulation Sealant.
 - b. United States Gypsum Co.; SHEETROCK Acoustical Sealant.

2.06 JOINT-SEALANT BACKING

- A. General: Provide sealant backings of material and type that are nonstaining; are compatible with joint substrates, sealants, primers, and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.
- B. Cylindrical Sealant Backings: ASTM C 1330, Type C (closed-cell material with a surface skin)] O (open- cell material) B (bicellular material with a surface skin) or any of the preceding types, as approved in writing by joint-sealant manufacturer for joint application indicated, and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance:
- C. Elastomeric Tubing Sealant Backings: Neoprene, butyl, EPDM, or silicone tubing complying with ASTM D 1056, nonabsorbent to water and gas, and capable of remaining resilient at temperatures down to minus 26 deg F (minus 32 deg C). Provide products with low

compression set and of size and shape to provide a secondary seal, to control sealant depth, and to otherwise contribute to optimum sealant performance.

2.07 MISCELLANEOUS MATERIALS

- A. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.
- B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants to joint substrates.
- C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

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.
- E. Concrete Floor Joints That Will Be Exposed in Completed Work: Test joint filler in an inconspicuous area to verify that it does not stain or discolor slab.

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. Install bond breaker backing tape where backer rod cannot be used.
- D. Install sealant free of air pockets, foreign embedded matter, ridges, and sags, and without getting sealant on adjacent surfaces.
- E. 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.
- F. Nonsag Sealants: Tool surface concave, unless otherwise indicated; remove masking tape immediately after tooling sealant surface.

3.04 FIELD QUALITY CONTROL

- A. See Section 014000 - Quality Requirements for additional requirements.
- B. Perform field quality control inspection/testing as specified in PART 1 under QUALITY ASSURANCE article.
- C. Remove and replace failed portions of sealants using same materials and procedures as indicated for original installation.

3.05 JOINT-SEALANT SCHEDULE

- A. Joint-Sealant Application JS-1: Exterior horizontal traffic isolation and contraction joints in cast-in-place concrete slabs.
 - 1. Joint Sealant: Single-component pourable urethane sealant ES-5.
 - 2. Joint-Sealant Color: As selected by Architect from manufacturer's full range.
- B. Joint-Sealant Application JS-2: Exterior vertical control and expansion joints in unit masonry.
 - 1. Joint Sealant: Single-component nonsag urethane sealant ES-1 OR ES-4.
 - 2. Joint-Sealant Color: As selected by Architect from manufacturer's full range.
- C. Joint-Sealant Application JS-3: Exterior perimeter joints between brick masonry and frames of doors windows and louvers.
 - 1. Joint Sealant: Single-component nonsag urethane sealant ES-4.
 - 2. Joint-Sealant Color: As selected by Architect from manufacturer's full range.
- D. Joint-Sealant Application JS-4: Interior perimeter joints of exterior openings.
 - 1. Joint Sealant: Latex sealant.
 - 2. Joint-Sealant Color: As selected by Architect from manufacturer's full range.

- E. Joint-Sealant Application JS-5: Interior joints between plumbing fixtures and adjoining walls, floors, and counters.
1. Joint Sealant: Single-component mildew-resistant neutral-curing silicone sealant ES-2.
 2. Joint-Sealant Color: White.

END OF SECTION

SECTION 079513 - EXPANSION JOINT COVER ASSEMBLIES

PART 1 GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

- A. Section Includes:
 - 1. Interior expansion control systems.
 - a. Exterior wall expansion control systems.
- B. Related Requirements:
 - 1. Section 077129 "Manufactured Roof Expansion Joints" for factory-fabricated roof expansion control.

1.03 ACTION SUBMITTALS

- A. Shop Drawings: For each expansion control system specified. Include plans, elevations, sections, details, splices, blockout requirement, attachments to other work, and line diagrams showing entire route of each expansion control system. Where expansion control systems change planes, provide isometric or clearly detailed drawing depicting how components interconnect.
- B. Samples for Initial Selection: For each type of expansion control system indicated.
 - 1. Include manufacturer's color charts showing the full range of colors and finishes available for each exposed metal and elastomeric seal material.
- C. Product Schedule: Prepared by or under the supervision of the supplier. Include the following information in tabular form:
 - 1. Manufacturer and model number for each expansion control system.
 - 2. Expansion control system location cross-referenced to Drawings.
 - 3. Nominal joint width.
 - 4. Movement capability.
 - 5. Classification as thermal or seismic.
 - 6. Materials, colors, and finishes.
 - 7. Product options.
 - 8. Fire-resistance ratings.

1.04 INFORMATIONAL SUBMITTALS

- A. Product Test Reports: For each fire barrier provided as part of an expansion control system, for tests performed by a qualified testing agency.

PART 2 - PRODUCTS

2.01 SYSTEM DESCRIPTION

- A. General: Provide expansion control systems of design, basic profile, materials, and operation indicated. Provide units with capability to accommodate variations in adjacent surfaces.
 - 1. Furnish units in longest practicable lengths to minimize field splicing. Install with hairline mitered corners where expansion control systems change direction or abut other materials.
 - 2. Include factory-fabricated closure materials and transition pieces, T-joints, corners, curbs, cross-connections, and other accessories as required to provide continuous expansion control systems.
- B. Coordination: Coordinate installation of exterior wall expansion control systems with roof expansion control systems to ensure that wall transitions are watertight. Roof expansion joint assemblies are specified elsewhere.

2.02 PERFORMANCE REQUIREMENTS

- A. Fire-Resistance Ratings: Where indicated, provide expansion control systems with fire barriers identical to those of systems tested for fire resistance per UL 2079 or ASTM E 1966 by a testing and inspecting agency acceptable to authorities having jurisdiction.
 - 1. Hose Stream Test: Wall-to-wall and wall-to-ceiling systems shall be subjected to hose stream testing.

2.03 INTERIOR EXPANSION CONTROL SYSTEMS

- A. Basis-of-Design Product: Subject to compliance with requirements, provide a product by Construction Specialties, indicated or a comparable product by one of the following:
 - 1. Architectural Art Mfg., Inc.; Division of Pittcon Industries.
 - 2. Construction Specialties, Inc.
 - 3. JointMaster/InPro Corporation.
 - 4. Michael Rizza Company, LLC.
 - 5. MM Systems Corporation.
 - 6. Nystrom, Inc.
 - 7. Watson Bowman Acme Corp.; a BASF Construction Chemicals business.
- B. Source Limitations: Obtain expansion control systems from single source from single manufacturer.
- C. Wall-to-Wall - Exterior:
 - 1. Basis-of-Design Product: Construction Specialties – VF Series
 - 2. Design Criteria:

- a. Nominal Joint Width: See Plans
 - b. Movement Capability: 100 percent.
 - c. Type of Movement: Seismic.
- D. Wall-to-Wall:
 - 1. Basis-of-Design Product: Construction Specialties – ASM
 - 2. Design Criteria:
 - a. Nominal Joint Width: See Plans
 - b. Movement Capability: 100 percent.
 - c. Type of Movement: Seismic.
- E. Wall-to-Corner:
 - 1. Basis of Design: Construction Specialties - ASMC
 - 2. Design Criteria:
 - a. Nominal Joint Width: See plan
 - b. Movement Capability: 100 percent
 - c. Type of Movement: Seismic
 - d. Color: As selected by Architect
- F. Wall-to-Ceiling:
 - 1. Basis-of-Design Product: Construction Specialties ASMC
 - 2. Design Criteria:
 - a. Nominal Joint Width: See Plan
 - b. Movement Capability: 100 percent.
 - c. Type of Movement: Seismic.
 - d. Finish: Clear anodic, Class 1
- G. Ceiling-to-Ceiling:
 - 1. Basis-of-Design Product: Construction Specialties ASM
 - 2. Design Criteria:
 - a. Nominal Joint Width: See Plan
 - b. Movement Capability: 100 percent.
 - c. Type of Movement: Seismic.
 - d. Finish: Clear anodic, Class 1

2.04 EXTERIOR WALL EXPANSION CONTROL SYSTEMS

- A. Basis-of-Design Product: Subject to compliance with requirements, provide a product by Construction Specialties indicated or a comparable product by one of the following:
 - 1. Architectural Art Mfg., Inc.; Division of Pittcon Industries.
 - 2. Chase Construction Products; Division of Chase Corporation.
 - 3. Construction Specialties, Inc.
 - 4. D. S. Brown Company (The).
 - 5. EMSEAL Corporation.
 - 6. Erie Metal Specialties, Inc.
 - 7. JointMaster/InPro Corporation.
 - 8. LymTal International, Inc.
 - 9. Michael Rizza Company, LLC.
 - 10. MM Systems Corporation.
 - 11. Nystrom, Inc.
 - 12. RJ Watson, Inc.

13. Schul International Company, Inc.
 14. Tremco Incorporated.
 15. Watson Bowman Acme Corp.; a BASF Construction Chemicals business.
 16. Williams Products, Inc.
- B. Source Limitations: Obtain expansion control systems from single source from single manufacturer.
- C. Wall-to-Wall:
1. Basis-of-Design Product: Construction Specialties – VF Series
 2. Design Criteria:
 - a. Nominal Joint Width: See Plans
 - b. Movement Capability: 100 percent.
 - c. Type of Movement: Seismic.

2.05 ACCESSORIES

- A. Moisture Barriers: Manufacturer's standard moisture barrier consisting of a continuous, waterproof membrane within joint and attached to substrate on sides of joint below the primary cover.
1. Drain-Tube Assemblies: Equip moisture barrier with drain tubes and seals to direct collected moisture to exterior-wall expansion control system.

2.06 MATERIALS

- A. Aluminum: ASTM B 221 (ASTM B 221M), Alloy 6063-T5 for extrusions; ASTM B 209 (ASTM B 209M), Alloy 6061-T6 for sheet and plate.
1. Apply manufacturer's standard protective coating on aluminum surfaces to be placed in contact with cementitious materials.
- B. Elastomeric Seals: ASTM E 1783; preformed elastomeric membranes or extrusions to be installed in metal frames.
- C. Compression Seals: ASTM E 1612; preformed elastomeric extrusions having an internal baffle system and designed to function under compression.
- D. Cellular Foam Seals: Extruded, compressible foam designed to function under compression.
- E. Fire Barriers: Any material or material combination, when fire tested after cycling, designated to resist the passage of flame and hot gases through a movement joint and to meet performance criteria for required fire-resistance rating.
1. Basis of Design: Balco – Model No. MBF2H
- F. Moisture Barrier: Flexible elastomeric material, PVC, minimum 30 mils thick.
- G. Nonmetallic, Shrinkage-Resistant Grout: ASTM C 1107/C 1107M, factory-packaged, nonmetallic aggregate grout, noncorrosive, nonstaining, mixed with water to consistency suitable for application and a 30-minute working time.

- H. Accessories: Manufacturer's standard anchors, clips, fasteners, set screws, spacers, and other accessories compatible with material in contact, as indicated or required for complete installations.

2.07 GENERAL FINISH REQUIREMENTS

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- C. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

2.08 ALUMINUM FINISHES

- A. Mill finish.
- B. Clear Anodic Finish: AAMA 611, AA-M12C22A41, Class I, 0.7 mils or thicker.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Examine surfaces where expansion control systems will be installed for installation tolerances and other conditions affecting performance of work.
 - 1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION

- A. Prepare substrates according to expansion control system manufacturer's written instructions.
- B. Coordinate and furnish anchorages, setting drawings, and instructions for installing expansion control systems. Provide fasteners of metal, type, and size to suit type of construction indicated and to provide for secure attachment of expansion control systems.
- C. Cast-In Frames: Coordinate and furnish frames to be cast into concrete.

3.03 INSTALLATION

- A. Comply with manufacturer's written instructions for storing, handling, and installing expansion control systems and materials unless more stringent requirements are indicated.

- B. Metal Frames: Perform cutting, drilling, and fitting required to install expansion control systems.
1. Install in true alignment and proper relationship to joints and adjoining finished surfaces measured from established lines and levels.
 2. Adjust for differences between actual structural gap and nominal design gap due to ambient temperature at time of installation. Notify Architect where discrepancies occur that will affect proper expansion control system installation and performance.
 3. Cut and fit ends to accommodate thermal expansion and contraction of metal without buckling of frames.
 4. Repair or grout blockout as required for continuous frame support using nonmetallic, shrinkage- resistant grout.
 5. Install frames in continuous contact with adjacent surfaces.
 - a. Shimming is not permitted.
 6. Locate anchors at interval recommended by manufacturer, but not less than 3 inches (75 mm) from each end and not more than 24 inches (600 mm) o.c.
- C. Seals in Metal Frames: Install elastomeric seals and membranes in frames to comply with manufacturer's written instructions. Install with minimum number of end joints.
1. Provide in continuous lengths for straight sections.
 2. Seal transitions according to manufacturer's written instructions. Vulcanize or heat-weld field- spliced joints as recommended by manufacturer.
 3. Installation: Mechanically lock seals into frames or adhere to frames with adhesive or pressure- sensitive tape as recommended by manufacturer.
- D. Compression Seals: Apply adhesive or lubricant adhesive as recommended by manufacturer to both frame interfaces or sides of slabs before installing compression seals.
- E. Foam Seals: Install with adhesive recommended by manufacturer.
- F. Epoxy-Bonded Seals: Pressurize seal for time period and to pressure recommended by manufacturer. Do not over pressurize.
- G. Terminate exposed ends of expansion control systems with field- or factory-fabricated termination devices.
- H. Fire-Resistance-Rated Assemblies: Coordinate installation of expansion control system materials and associated work so complete assemblies comply with assembly performance requirements.
1. Fire Barriers: Install fire barriers to provide continuous, uninterrupted fire resistance throughout length of joint, including transitions and field splices.

- I. Moisture Barrier: Provide at all exterior joints and where indicated on Drawings. Provide drainage fittings at a maximum of 50 feet (15.2 m) or where indicated on Drawings.

3.04 PROTECTION

- A. Do not remove protective covering until finish work in adjacent areas is complete. When protective covering is removed, clean exposed metal surfaces to comply with manufacturer's written instructions.
- B. Protect the installation from damage by work of other Sections. Where necessary due to heavy construction traffic, remove and properly store cover plates or seals and install temporary protection over expansion control systems. Reinstall cover plates or seals prior to Substantial Completion of the Work.

END OF SECTION

SECTION 081113 - HOLLOW METAL DOORS AND FRAMES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Non-fire-rated hollow metal doors and frames.
- B. Hollow metal frames for wood doors.
- C. Fire-rated hollow metal doors and frames.
- D. Thermally insulated hollow metal doors with frames.
- E. Hollow metal borrowed lites glazing frames.
- F. Accessories, including glazing.

1.02 RELATED REQUIREMENTS

- A. Section 087100 - Door Hardware.
- B. Section 088000 - Glazing: Glass for doors and borrowed lites.

1.03 REFERENCE STANDARDS

- A. ANSI/SDI A250.4 - Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors, Frames and Frame Anchors; 2024.
- B. ANSI/SDI A250.6 - Recommended Practice for Hardware Reinforcing on Standard Steel Doors and Frames; 2024.
- 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; 2025.
- E. ASTM C143/C143M - Standard Test Method for Slump of Hydraulic-Cement Concrete; 2020.
- F. ASTM C476 - Standard Specification for Grout for Masonry; 2023.
- G. ITS (DIR) - Directory of Listed Products; Current Edition.
- H. NAAMM HMMA 840 - Guide Specifications for Receipt, Storage and Installation of Hollow Metal Doors and Frames; 2024.
- I. NAAMM HMMA 861 - Guide Specifications for Commercial Hollow Metal Doors and Frames; 2014.
- J. NFPA 80 - Standard for Fire Doors and Other Opening Protectives; 2025.
- K. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies; 2022.
- L. SDI 117 - Manufacturing Tolerances for Standard Steel Doors and Frames; 2023.
- M. UL (DIR) - Online Certifications Directory; Current Edition.

- N. UL 10C - Standard for Positive Pressure Fire Tests of Door Assemblies; Current Edition, Including All Revisions.

1.04 SUBMITTALS

- A. See Section 013000 - Administrative Requirements for submittal procedures.
- B. Product Data: Materials and details of design and construction, hardware locations, reinforcement type and locations, anchorage and fastening methods, and finishes; and one copy of referenced standards/guidelines.
- C. Shop Drawings: Details of each opening, showing elevations, glazing, frame profiles, and any indicated finish requirements.
- D. Samples: Submit two samples of metal, 2 by 2 inches (51 by 51 mm) in size, showing factory finishes, colors, and surface texture.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Provide hollow metal doors and frames from SDI Certified manufacturer: <https://steeldoors.org/sdi-certified/#sle>.
- B. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years of documented experience.
- C. Maintain at project site copies of reference standards relating to installation of products specified.

1.06 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: www.assaabloydss.com/#sle.
 - 2. Curries, an Assa Abloy Group company: www.assaabloydss.com/#sle.
 - 3. Deansteel Manufacturing Company, Inc; Hollow Metal Doors - SP Series: www.deansteel.com/#sle.
 - 4. De La Fontaine; HC - Honeycomb Core: www.delafontaine.com/#sle.
 - 5. Dunbarton Corporation; Hollow Metal: www.dunbarton.com/#sle.
 - 6. Fleming Door Products, an Assa Abloy Group company: www.assaabloydss.com/#sle.

7. Krieger Specialty Products: www.kriegerproducts.com/#sle.
8. Mesker, dormakaba Group; FDJ Series Drywall Frames: www.meskeropeningsgroup.com/#sle.
9. Premier Steel Doors and Frames: www.trustpremier.com/#sle.
10. Republic Doors, an Allegion brand: www.republicdoor.com/#sle.
11. Steelcraft, an Allegion brand: www.allegion.com/#sle.
12. Substitutions: See Section 016000 - Product Requirements.

2.02 PERFORMANCE REQUIREMENTS

- A. Combined Requirements: If a particular door and frame unit is indicated to comply with more than one type of requirement, comply with the specified requirements for each type; for instance, an exterior door that is also indicated as being sound-rated must comply with the requirements specified for exterior doors and for sound-rated doors; where two requirements conflict, comply with the most stringent.

2.03 HOLLOW METAL DOORS

- A. Door Finish: Factory primed and field finished.
- B. Exterior Doors: Thermally insulated.
 1. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).
 - a. Level 4 - Extra Heavy-duty.
 - b. Physical Performance Level A, 1,000,000 cycles; in accordance with ANSI/SDI A250.4.
 - c. Model 2 - Seamless.
 2. Core:
 - a. Honeycomb
 - 1) Kraft Paper honeycomb is prohibited.
 - b. Grid
 - c. Vertical Steel rib.
 - d. Polystyrene and polyurethane cores are prohibited.
 3. Door Thickness: 1-3/4 inches (44.5 mm), nominal.
 4. Weatherstripping: Refer to Section 087100.
 5. Face: Metallic-coated steel sheet, minimum thickness of 0.067, with minimum A40 (ZF120) coating.
- C. Interior Doors, Non-Fire-Rated:
 1. Materials
 - a. ANSI/SDI-A250 Level 3 Heavy Duty; 16 gauge face except as itemized below.
 2. Door Thickness: 1-3/4 inches (44.5 mm), nominal.
 3. Door Face Sheets: Model 2, Seamless
 4. Face: Metallic-coated steel sheet, minimum thickness of 0.067, with minimum A40 (ZF120) coating.
- D. Fire-Rated Doors:
 1. Materials
 - a. ANSI/SDI-A250 Level 3 Heavy Duty; 16 gauge face except as itemized below.

2. Fire Rating: As indicated on Door Schedule, tested in accordance with UL 10C and NFPA 252 ("positive pressure fire tests").
3. Provide units listed and labeled by UL (DIR) or ITS (DIR).
 - a. Attach fire rating label to each fire rated unit.
4. Door Thickness: 1-3/4 inches (44.5 mm), nominal.
5. Door Face Sheets: Model 2, Seamless
6. Face: Metallic-coated steel sheet, minimum thickness of 0.067, with minimum A40 (ZF120) coating.

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. Materials: Metallic-Coated steel sheet, minimum thickness of 0.067-inch, with minimum A40 (ZF120) coating.
- C. Exterior Door Frames: Full profile/continuously welded type.
 1. Frame Metal Thickness: 14 gauge, 0.067 inch (1.7 mm), minimum.
 2. Frame Finish: Factory primed and field finished.
 3. Weatherstripping: Separate, see Section 087100.
- D. Interior Door Frames, Non-Fire Rated: Full profile/continuously welded type.
 1. Terminated Stops: Provide at interior doors; closed end stop terminated 6 inch (150 mm), maximum, above floor at 45 degree angle.
 2. Frame Metal Thickness: 16 gauge, 0.053 inch (1.3 mm), minimum.
 3. Frame Finish: Factory primed and field finished.
- E. Door Frames, Fire-Rated: Full profile/continuously welded type.
 1. Fire Rating: Same as door, labeled.
 2. Frame Metal Thickness: 16 gauge, 0.053 inch (1.3 mm), minimum.
 3. Frame Finish: Factory primed and field finished.
- 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 (102 mm) high to fill opening without cutting masonry units.
- J. Frames Wider than 48 inches (1219 mm): Reinforce with steel channel fitted tightly into frame head, flush with top.

2.05 FINISHES

- A. Primer: Rust-inhibiting, complying with ANSI/SDI A250.10, door manufacturer's standard.

2.06 ACCESSORIES

- A. Glazing: As specified in Section 088000, factory installed.
- B. Grout for Frames: Mortar grout complying with ASTM C476 with maximum slump of 4 inches (102 mm) as measured in accordance with ASTM C143/C143M for hand troweling in place; plaster grout and thinner pumpable grout are prohibited.

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 087100.
 - 1. Comply with recommended practice for hardware placement of doors and frames in accordance with ANSI/SDI A250.6 or NAAMM HMMA 861.
- F. Comply with glazing installation requirements of Section 088000.

3.04 TOLERANCES

- A. Clearances Between Door and Frame: Comply with related requirements of specified frame standards or custom guidelines indicated in accordance with SDI 117 or NAAMM HMMA 861.
- B. Maximum Diagonal Distortion: 1/16 inch (1.6 mm) measured with straight edge, corner to corner.

3.05 ADJUSTING

- A. Adjust for smooth and balanced door movement.

3.06 SCHEDULE

- A. Refer to Door and Frame Schedule on the drawings.

END OF SECTION

SECTION 081416 - FLUSH WOOD DOORS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Flush wood doors; flush and flush glazed configuration; fire-rated and sound-rated.

1.02 RELATED REQUIREMENTS

- A. Section 081113 - Hollow Metal Doors and Frames.
- B. Section 087100 - Door Hardware.
- C. Section 088000 - Glazing.

1.03 REFERENCE STANDARDS

- A. UL 10C - Standard for Positive Pressure Fire Tests of Door Assemblies; Current Edition, Including All Revisions.
- B. WDMA I.S. 1A - Interior Architectural Wood Flush Doors; 2021, with Errata (2022).

1.04 SUBMITTALS

- A. See Section 013000 - Administrative Requirements for submittal procedures.
- B. Product Data: Indicate door core materials and construction; veneer species, type and characteristics.
- C. Shop Drawings: Show doors and frames, elevations, sizes, types, swings, undercuts, beveling, blocking for hardware, factory machining, factory finishing, cutouts for glazing and other details.
- D. Samples: Submit two samples of door veneer, 4 by 4 inches in size illustrating wood grain, stain color, and sheen.
- E. 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. Company with at least one project within past five years with value of woodwork within at least 20 percent of cost of woodwork for this project.
- B. Installer Qualifications: Company specializing in performing work of the type specified in this section, with not less than three years of documented experience.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Package, deliver and store doors in accordance with specified quality standard.
- B. Accept doors on site in manufacturer's packaging, 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 017800 - Closeout Submittals for additional warranty requirements.
- B. Manufacturer Warranty: Provide manufacturer's warranty on interior doors for the life of the installation. Complete forms in Owner's name and register with manufacturer.
 - 1. Include coverage for delamination of veneer, warping beyond specified installation tolerances, defective materials, and telegraphing core construction.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Wood Veneer Faced Doors:
 - 1. Haley Brothers: www.haleybros.com/#sle.
 - 2. Horton Automatics, a division of Overhead Door Corporation; FlexBarn: www.overheaddoor.com/#sle.
 - 3. Krieger Specialty Products: www.kriegerproducts.com/#sle.
 - 4. Forte Opening Solutions; Aspiro Select Wood Veneer Doors: www.forteopenings.com/#sle.
 - 5. Oregon Door: www.oregondoor.com/#sle.
 - 6. VT Industries, Inc www.vtindustries.com/#sle.
 - 7. Substitutions: See Section 016000 - 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 WDMA I.S. 1A.
 - 2. Wood Veneer Faced Doors: 5-ply or 7-ply unless otherwise indicated.
- B. Interior Doors: 1-3/4 inches (44 mm) 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.

2.03 DOOR AND PANEL CORES

- A. Non-Rated Solid Core and 20 Minute Rated Doors: Type structural composite lumber core (SCLC), plies and faces as indicated.
- B. Fire-Rated Doors: Mineral core type, with fire resistant composite core (FD), plies and faces as indicated above; with core blocking as required to provide adequate anchorage of hardware without through-bolting.

2.04 DOOR FACINGS

- A. Veneer Facing for Transparent Finish: Maple, Match to White Oak, Satin Finish, veneer grade in accordance with quality standard indicated, plain sliced (flat cut), with book match between leaves of veneer, running match of spliced veneer leaves assembled on door or panel face.
 - 1. Vertical Edges: Any option allowed by quality standard for grade.
 - 2. "Running Match" each pair of doors and doors in close proximity to each other.
 - 3. "Pair Match" each pair of doors; "Set Match" pairs of doors within 10 feet (3 m) of each other when doors are closed.

2.05 DOOR CONSTRUCTION

- A. Fabricate doors in accordance with door quality standard specified.
- B. Cores Constructed with stiles and rails:
 - 1. Provide solid blocks at lock edge for hardware reinforcement.
 - 2. Provide solid blocking for other throughbolted hardware.
- 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. Finish work in accordance with WDMA I.S. 1A for grade specified and as follows:
 - 1. Finish:
 - a. System - TR-6, Catalyzed Polyurethane.
 - b. Stain: Match to White Oak
 - c. Sheen: Satin.
- B. Factory finish doors in accordance with approved sample.
- C. Seal door top edge with color sealer to match door facing.

2.07 ACCESSORIES

- A. Hollow Metal Door Frames: See Section 081113.
- B. Glazed Openings:
 - 1. Glazing: Single vision units, 1/4 inch (6.4 mm) thick glass.
 - 2. Tint: Clear.
- C. Glazing: See Section 088000.
- D. Glazing Stops: Wood, of same species as door facing, butted corners; prepared for countersink style tamper proof screws.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Verify that opening sizes and tolerances are acceptable.
- C. Do not install doors in frame openings that are not plumb or are out-of-tolerance for size or alignment.

3.02 INSTALLATION

- A. Install doors in accordance with manufacturer's instructions and specified quality standard.
- B. 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 ADJUSTING

- A. Adjust doors for smooth and balanced door movement.
- B. Adjust closers for full closure.

END OF SECTION

SECTION 083100 - ACCESS DOORS AND PANELS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Wall- and ceiling-mounted access units.

1.02 RELATED REQUIREMENTS

- A. Section 087100 - Door Hardware: Mortise cylinder and core hardware.

PART 2 PRODUCTS

2.01 ACCESS DOORS AND PANELS ASSEMBLIES

2.02 Wall- and Ceiling-MOUNTED ACCESS UNITS

- A. Manufacturers:

1. Activar Construction Products Group, Inc. - JL Industries: www.activarcpg.com/#sle.
2. Babcock-Davis: www.babcockdavis.com/#sle.
3. BAUCO Access Panel Solutions Inc: www.bauco.com/#sle.
4. Best Access Doors: www.bestaccessdoors.com/#sle.
5. Cendrex, Inc: www.cendrex.com/#sle.
6. Elmdor: www.elmdor.com/#sle.
7. FF Systems, Inc: www.ffaystemsinc.com/#sle.
8. Fire-End & Croker Corporation: www.croker.com/#sle.
9. Karp Associates, Inc: www.karpinc.com/#sle.
10. MIFAB, Inc; UA Series: www.mifab.com/#sle.
11. Nystrom, Inc; HVAC - Access Doors: www.nystrom.com/#sle.
12. Studco Building Systems; EZConcept AccessDor : www.studcosystems.com/#sle.
13. The Williams Brothers Corporation of America; GP SS 100 Series - Stainless Steel Premium Door: www.wbdoors.com/#sle.
14. Substitutions: See Section 016000 - Product Requirements.

- B. Wall- and Ceiling-Mounted Units: Factory-fabricated door and frame, fully assembled units with corner joints welded, filled and ground flush; square and without rack or warp; coordinate requirements with type of installation assembly being used for each unit.

1. Material: Steel.
2. Door Style: Single thickness with rolled or turned in edges.
3. Heavy-Duty Frames: 14-gauge, 0.0747-inch (1.89 mm) minimum thickness.
4. Heavy-Duty Single Steel Sheet Door Panels: 14-gauge, 0.0747-inch (1.89 mm) minimum thickness.
5. Steel Finish: Primed.
6. Primed and Factory Finish: Polyester powder coat; color selected by Architect.
7. Hardware:

- a. Hinges for Non-Fire-Rated Units: Concealed, constant force closure spring type.
- b. Latch/Lock: Tamperproof tool-operated cam latch.

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

SECTION 083313 - COILING COUNTER DOORS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Non-fire-rated coiling counter doors and operating hardware.
- B. Electric motor operation; wiring from electric circuit disconnect to operator to control station.

1.02 RELATED REQUIREMENTS

- A. Section 079200 - Joint Sealants: Sealing joints between frames and adjacent construction.
- B. Section 087100 - Door Hardware: Cylinder cores and keys.
- C. Section 260583 - Wiring Connections: Power to disconnect.

1.03 REFERENCE STANDARDS

- A. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2021.
- B. ITS (DIR) - Directory of Listed Products; Current Edition.
- C. NEMA MG 00001 - Motors and Generators; 2024.
- D. UL (DIR) - Online Certifications Directory; Current Edition.

1.04 SUBMITTALS

- A. See Section 013000 - Administrative Requirements for submittal procedures.
- B. Product Data: Submit manufacturer's standard literature showing materials and details of construction and finish. Include data on electrical operation.
- C. Shop Drawings: Indicate rough and actual opening dimensions, anchorage methods, hardware locations, and installation details.
- D. Samples: Two slats, 4 inches long (102 mm long), illustrating shape, color, and finish texture.
- E. Operation and Maintenance Data: Indicate modes of operation, lubrication requirements and frequency, and periodic adjustments required.
- F. Project Record Documents: Include as-built electrical diagrams for electrical operation and connection to fire alarm system.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years of documented experience.

- B. Products Requiring Electrical Connection: Listed and classified by ITS (DIR), UL (DIR), or testing firm acceptable to authorities having jurisdiction as suitable for the purpose specified in this section and indicated on the drawings.

1.06 WARRANTY

- A. See Section 017800 - Closeout Submittals for additional warranty requirements.
- B. Manufacturer Warranty: Provide 2-year manufacturer warranty for counterbalance shaft assembly. Complete forms in Owner's name and register with manufacturer.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Coiling Counter Doors:
 - 1. Alpine Overhead Doors, Inc; Counter Shutter - Rolling Shutters: www.alpinedoors.com/#sle.
 - 2. ASTA America by Janus International; 700 Series Counter Shutter: www.astaamerica.com/#sle.
 - 3. C.H.I. Overhead Doors; Model 6522 (steel): www.chiohd.com/#sle.
 - 4. Clopay: www.clopaydoor.com/#sle.
 - 5. Overhead Door Corporation; Counter Door - Model 650: www.overheaddoor.com/#sle.
 - 6. Raynor Garage Doors; DuraShutter: www.raynor.com/#sle.
 - 7. Wayne-Dalton, a Division of Overhead Door Corporation; Security Shutter - Model 523: www.wayne-dalton.com/#sle.
 - 8. Substitutions: See Section 016000 - Product Requirements.

2.02 COILING COUNTER DOORS

- A. Coiling Counter Metal Doors, Non-Fire-Rated: Aluminum slat curtain.
 - 1. Mounting: Interior face mounted.
 - 2. Nominal Slat Size: 1-1/4 inches (32 mm) wide.
 - 3. Slat Profile: Flat, perforated.
 - 4. Finish, Aluminum: Anodized.
 - 5. Color: As selected by Architect from manufacturer's standard range.
 - 6. Guides: Formed track; same material and finish unless otherwise indicated.
 - 7. Hood Enclosure: Manufacturer's standard; primed steel.
 - 8. Electric operation.
 - 9. Locking Devices: Lock and latch handle on outside.

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 angles to provide reinforcement and positive contact in closed position.
3. Aluminum Slats: ASTM B221 (ASTM B221M), aluminum alloy Type 6063; minimum thickness 0.05 inch (1.3 mm).
- B. Guide Construction: Continuous, of profile to retain door in place, with mounting brackets of same metal.
 1. Aluminum Guides: Extruded aluminum channel, with wool pile runners along inside.
- C. Hood Enclosure: Internally reinforced to maintain rigidity and shape.
- D. Lock Hardware:
 1. Cylindrical Locking Mechanism: Latchset lock cylinder, specified in Section 087100.
 2. For motor operated units, additional lock or latching mechanisms are not required.
 3. Latch Handle: Manufacturer's standard.
- 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 (10 kg) nominal force to operate.

2.04 ELECTRIC OPERATION

- A. Operator, Controls, Actuators, and Safeties: Listed and classified by ITS (DIR), UL (DIR), or testing agency acceptable to authorities having jurisdiction (AHJ) as suitable for purpose specified and indicated.
 1. Provide interlock switches on motor operated units.
- B. Electric Operators:
 1. Mounting: Side mounted.
 2. Motor Enclosure: NEMA MG 00001.
 3. Motor Rating: As recommended by manufacturer; continuous duty.
 4. Motor Voltage: 110-120 VAC, single phase, 60 Hz.
 5. Opening Speed: 6 inches per second (150 mm/sec).
 6. Manual override in case of power failure.
- C. Control Station: Standard three button (OPEN-STOP-CLOSE) momentary control for each electrical operator.
 1. Controls: 24 VAC circuit.
 2. Surface mounted.
- D. Safety Edge: Located at bottom of curtain, full width, electro-mechanical sensitized type, wired to stop operator upon striking object, hollow neoprene covered.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that adjacent construction is suitable for door installation.
- B. Verify that electrical services have been installed and are accessible.

- C. Verify that door opening is plumb, header is level, and dimensions are correct.
- D. Notify Architect of any unacceptable conditions or varying dimensions.
- E. 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.
- E. Coordinate installation of electrical service with Section 260583.
- F. Complete wiring from disconnect to unit components.

3.03 TOLERANCES

- A. Maintain dimensional tolerances and alignment with adjacent work.
- B. Maximum Variation From Plumb: 1/16 inch (1.5 mm).
- C. Maximum Variation From Level: 1/16 inch (1.5 mm).
- D. Longitudinal or Diagonal Warp: Plus or minus 1/8 inch per 10 ft (3 mm per 3 m) straight edge.

3.04 ADJUSTING

- A. Adjust operating assemblies for smooth and noiseless operation.

3.05 CLEANING

- A. Clean installed components.
- B. Remove labels and visible markings.

END OF SECTION

SECTION 083323 - OVERHEAD COILING DOORS

PART 1 GENERAL

1.01 Section Includes

- A. Exterior coiling doors.
- B. Electric operators and control stations.
- C. Wiring from electric circuit disconnect to operators and control stations.

1.02 Related Requirements

- A. Section 079200 - Joint Sealants: Sealing joints between frames and adjacent construction.
- B. Section 087100 - Door Hardware: Cylinder cores and keys.
- C. Section 260583 - Wiring Connections: Power to disconnect.

1.03 Reference Standards

- A. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2019.
- B. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2024.
- C. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2025.
- D. ITS (DIR) - Directory of Listed Products; Current Edition.
- E. NEMA EN 10250 - Enclosures for Electrical Equipment (1000 Volts Maximum); 2024.
- F. NEMA ICS 2 - Industrial Control and Systems Controllers, Contactors and Overload Relays Rated 600 Volts; 2008 (Reaffirmed 2020).
- G. NEMA MG 00001 - Motors and Generators; 2024.
- H. UL (DIR) - Online Certifications Directory; Current Edition.
- I. UL 325 - Standard for Door, Drapery, Gate, Louver, and Window Operators and Systems; Current Edition, Including All Revisions.

1.04 Submittals

- A. See Section 013000 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide general construction, electrical equipment, and component connections and details.
- C. Shop Drawings: Indicate pertinent dimensioning, anchorage methods, hardware locations, and installation details.
- D. Samples: Two slats in size illustrating shape, color and finish texture.

- E. Maintenance Data: Indicate lubrication requirements and frequency, periodic adjustments required.
- F. Specimen warranty.

1.05 Quality Assurance

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years of documented experience.
- B. Products Requiring Electrical Connection: Listed and classified by ITS (DIR), UL (DIR), or testing firm acceptable to authorities having jurisdiction as suitable for purpose specified and indicated.

1.06 Warranty

- A. See Section 017800 - Closeout Submittals for additional warranty requirements.
- B. Manufacturer Warranty: Provide 2-year manufacturer warranty for roller shaft counterbalance assembly. Complete forms in Owner's name and register with manufacturer.

PART 2 PRODUCTS

2.01 Manufacturers

- A. Overhead Coiling Metal Doors:
 - 1. Alpine Overhead Doors, Inc; Wind-Tite - Warehouse Door: www.alpinedoors.com/#sle.
 - 2. Amarr; Amarr 4200 Series Rolling Slat Door: www.amarr.com/commercial/#sle.
 - 3. ASTA America by Janus International; 300 Series Commercial Slat Door: www.astaamerica.com/#sle.
 - 4. Clopay: www.clopaydoor.com/#sle.
 - 5. Overhead Door Corporation; Model 610 Rolling Service Door: www.overheaddoor.com/#sle.
 - 6. Raynor Garage Doors: www.raynor.com/#sle.
 - 7. Substitutions: See Section 016000 - Product Requirements.

2.02 COILING DOORS

- A. Exterior Coiling Doors: Steel slat curtain.
 - 1. Capable of withstanding positive and negative wind loads of 20 psf (940 Pa) without undue deflection or damage to components.
 - 2. Sandwich Slats: Manufacturer's standard, with core of foamed-in-place polyurethane insulation; minimum R-value of 4.88 (RSI-value of 0.86).
 - 3. Finish: Factory painted, color as selected.
 - 4. Guide, Angles: Galvanized steel.
 - 5. Guides, Formed Sheet Metal: Galvanized steel.
 - 6. Hood Enclosure: Manufacturer's standard; galvanized steel.

7. Electric operation.
8. Mounting: Face mounted.

2.03 MATERIALS

- A. Metal Curtain Construction: Interlocking slats.
 1. Curtain Bottom for Slat Curtains: Fitted with angles to provide reinforcement and positive contact in closed position.
 2. Weatherstripping for Exterior Doors: Moisture and rot proof, resilient type, located at jamb edges, bottom of curtain, and where curtain enters hood enclosure of exterior doors.
 3. Steel Slats: Minimum thickness to meet span requirements of door with material ASTM A653/A653M galvanized steel sheet.
- B. Guide Construction: Continuous, of profile to retain door in place with snap-on trim, mounting brackets of same metal.
- C. Guides - Angle: ASTM A36/A36M metal angles, size as indicated.
 1. Hot-dip galvanized in compliance with ASTM A123/A123M.
- D. Guides - Sheet Metal:
 1. Hot-Dip Galvanizing: Minimum G90 (Z275) coating, in compliance with ASTM A653/A653M.
- E. Hood Enclosure and Trim: Internally reinforced to maintain rigidity and shape.
- F. Lock Hardware:
 1. Cylindrical Locking Mechanism: Latchset lock cylinder, specified in Section 087100.
 2. For motor operated units, additional lock or latching mechanisms are not required.

2.04 Electric Operation

- A. Operator, Controls, Actuators, and Safeties: Comply with UL 325; provide products listed by ITS (DIR), UL (DIR), or testing agency acceptable to authorities having jurisdiction.
 1. Provide interlock switches on motor operated units.
- B. Electric Operators:
 1. Mounting: Side mounted.
 2. Motor Enclosure:
 - a. Exterior Coiling Doors: NEMA MG 00001, Type 4; open drip proof.
 3. Motor Rating: 1/3 HP (250 W); continuous duty.
 4. Motor Voltage: 120 volts, single phase, 60 Hz.
 5. Motor Controller: NEMA ICS 2, full voltage, reversing magnetic motor starter.
 6. Controller Enclosure: NEMA EN 10250, Type 4.
 7. Opening Speed: 12 inches per second (300 mm/sec).
 8. Brake: Manufacturer's standard type, activated by motor controller.
 9. Manual override in case of power failure.
 10. See Section 260583 for electrical connections.
- C. Control Station: Provide standard three button, 'Open-Close-Stop' momentary-contact control device for each operator complying with UL 325.
 1. 24 volt circuit.
 2. Surface mounted, at interior door jamb.

3. Entrapment Protection Devices: Provide sensing devices and safety mechanisms complying with UL 325.
 - a. Primary Device: Provide electric sensing edge, wireless sensing, NEMA 1 photo eye sensors, or NEMA 4X photo eye sensors as required with momentary-contact control device.
- D. Safety Edge: Located at bottom of coiling door, full width, electro-mechanical sensitized type, wired to stop and reverse door direction upon striking object, hollow neoprene covered.

PART 3 EXECUTION

3.01 Examination

- A. Verify that adjacent construction is suitable for door installation.
- B. Verify that electrical services have been installed and are accessible.
- C. Verify that door opening is plumb, header is level, and dimensions are correct.
- D. Notify Architect of any unacceptable conditions or varying dimensions.
- E. 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.
- E. Coordinate installation of electrical service with Section 260583.
- F. Complete wiring from disconnect to unit components.
- G. Install enclosure and perimeter trim.

3.03 Tolerances

- A. Maintain dimensional tolerances and alignment with adjacent work.
- B. Maximum Variation From Plumb: 1/16 inch (1.6 mm).
- C. Maximum Variation From Level: 1/16 inch (1.6 mm).
- D. Longitudinal or Diagonal Warp: Plus or minus 1/8 inch per 10 feet (3.2 mm per 3 m) 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.

SECTION 083344 - OVERHEAD COILING FIRE SHUTTER

PART 1 GENERAL

1.01 Section Includes

- A. Deployable vertical fire curtains.

1.02 Related Requirements

- A. Section 211300 - Fire-Suppression Sprinkler Systems.
- B. Section 260533.13 - Conduit for Electrical Systems.
- C. Section 260583 - Wiring Connections.
- D. Section 284600 - Fire Detection and Alarm.

1.03 Reference Standards

- A. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2024.
- B. FM (AG) - FM Approval Guide; Current Edition.
- C. ITS (DIR) - Directory of Listed Products; Current Edition.
- D. NFPA 80 - Standard for Fire Doors and Other Opening Protectives; 2025.
- E. NFPA 105 - Standard for Smoke Door Assemblies and Other Opening Protectives; 2025.
- F. UL (DIR) - Online Certifications Directory; Current Edition.
- G. UL 10B - Standard for Fire Tests of Door Assemblies; Current Edition, Including All Revisions.
- H. UL 864 - Control Units and Accessories for Fire Alarm Systems; Current Edition, Including All Revisions.
- I. UL 1784 - Standard for Air Leakage Tests of Door Assemblies and Other Opening Protectives; Current Edition, Including All Revisions.

1.04 Submittals

- A. See Section 013000 - Administrative Requirements for submittal procedures.
- B. Product Data: Submit manufacturer's technical literature describing product components, connections, operation details, and required electrical equipment.
- C. Manufacturer's installation instructions.
- D. Field Quality Control Submittals: Report of field testing.
- E. Manufacturer's qualification statement.
- F. Installer's qualification statement.

1.05 Quality Assurance

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, 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 and approved by manufacturer.

PART 2 PRODUCTS

2.01 Manufacturers

- A. Deployable Vertical Fire Shutter:
 - 1. McKeon – Safescape T5000 Series
 - 2. Substitutions: See Section 016000 - Product Requirements.

2.02 Fire Curtains

- A. Fire Curtains:
 - 1. Deployable vertical curtain.
 - a. Fire Rating: As indicated on drawings and schedules.
 - b. Self-closing or automatic closing protective curtains in accordance with NFPA 80 and NFPA 105.
 - 2. Configurations: Refer to drawings and schedules for layout and additional requirements.

2.03 COMPONENTS

- A. Roller Assembly: Horizontal structural support with minimal deflection of protective curtain assembly, sized to incorporate motor drive unit.
- B. Hood Assembly: Totally enclosed curtain and roller assembly with approved smoke seals and removable cover plates to access curtain rollers.
 - 1. Enclosure: Galvanized steel, with manufacturer's standard finish.
 - 2. Mounting: As indicated on drawings.
 - 3. Height and Depth: As indicated on drawings.
- C. Mounting Brackets: Metal plates and brackets as required for supporting hood assembly.
 - 1. Mounting: As indicated on drawings.
- D. Vertical Guide Assemblies: Guide rails to secure curtain during deployment and operation, with positive mechanical curtain retention.
- E. Bottom Bar: Provide seal at sill with necessary stiffness to limit deflection caused by air pressure currents.
- F. Motor: Auto-Set automatic resetting electric motor operator system.

2.04 Operational Controls

- A. Operator, Controls, Actuators, and Safeties: Provide products listed by FM (AG), ITS (DIR), UL (DIR), or testing agency acceptable to authorities having jurisdiction.
 - 1. Operable curtain that deploys within 10 seconds upon actuation signal from fire alarm system, local smoke detector, sprinkler alarm system, or loss of electric power to unit with listed releasing device. Comply with UL 864.
- B. Test Feature: Provide simple and easily accessible switch feature to test and confirm correct function of curtain.
- C. Fail-Safe Release Device:
 - 1. When release mechanism's power is interrupted by alarm condition, curtain automatically self-closes.
 - 2. Upon restoration of power and with cleared alarm condition, curtain release mechanism resets to open position.

PART 3 EXECUTION

3.01 Examination

- A. Verify, with installer present, blocking, installation tolerances, clearances, and other conditions needed for this work.
- B. Correct unsatisfactory conditions before proceeding with installation.

3.02 Installation

- A. Install system in accordance with manufacturer's written installation instructions.
- B. Install anchorage devices to securely fasten hood assembly to substrate and building framing without distortion or stress.
- C. Install conduit and wiring from disconnect to unit components. Coordinate electrical service installation; see Section 260533.13 and Section 260583.
- D. Coordinate fire suppression sprinkler system connection; see Section 211300.
- E. Coordinate fire alarm system and smoke detector connection; see Section 284600.

3.03 Field Quality Control

- A. See Section 014000 - Quality Requirements for additional requirements.
- B. Provide services of manufacturer's field representative to observe installation, conduct field testing and inspection, and submit report.
- C. Provide testing and inspection for the following:
 - 1. Verify protective curtain deploys upon signal from fire alarm system or local smoke detectors.
 - 2. Verify protective curtain deploys by gravity upon damage to control panel or loss of power.

3.04 Closeout Activities

A. Demonstration: Demonstrate proper operation of system to Owner's designated personnel.

1. Describe function, operation, and maintenance of each component.

END OF SECTION

SECTION 083473 - SOUND CONTROL DOOR ASSEMBLIES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Sound control door assemblies.
 - 1. Wood doors and metal frames.
 - 2. Fire-rated doors and frames.
 - 3. Interior doors and frames, non-fire-rated.
- B. Accessories, including glazing and matching panels.

1.02 RELATED REQUIREMENTS

- A. Section 087100 - Door Hardware.
- B. Section 088000 - Glazing: Glass for doors and borrowed lites.

1.03 REFERENCE STANDARDS

- A. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.
- B. ANSI/SDI A250.3 - Test Procedure and Acceptance Criteria for Factory Applied Finish Coatings for Steel Doors and Frames; 2025.
- 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; 2025.
- E. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements; 2023.
- F. ASTM E336 - Standard Test Method for Measurement of Airborne Sound Attenuation Between Rooms in Buildings; 2025.
- G. ASTM E413 - Classification for Rating Sound Insulation; 2022.
- H. BHMA A156.115 - Hardware Preparation in Steel Doors and Frames; 2016.
- I. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2017.
- J. ITS (DIR) - Directory of Listed Products; Current Edition.
- K. NAAMM HMMA 830 - Hardware Selection for Hollow Metal Doors and Frames; 2002.
- L. NAAMM HMMA 831 - Hardware Locations for Hollow Metal Doors and Frames; 2024.
- M. NAAMM HMMA 865 - Guide Specifications for Sound Control Hollow Metal Door and Frame Assemblies; 2013.
- N. NFPA 80 - Standard for Fire Doors and Other Opening Protectives; 2025.
- O. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies; 2022.
- P. SDI 117 - Manufacturing Tolerances for Standard Steel Doors and Frames; 2023.

- Q. UL (DIR) - Online Certifications Directory; Current Edition.
- R. UL 10C - Standard for Positive Pressure Fire Tests of Door Assemblies; Current Edition, Including All Revisions.
- S. WDMA I.S. 1A - Interior Architectural Wood Flush Doors; 2021, with Errata (2022).

1.04 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years documented experience.
- B. Maintain at project site copies of reference standards relating to installation of products specified.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Protect wood doors in compliance with WDMA I.S. 1A and specified requirements.
- B. Store wood doors with resilient packaging sealed with heat shrunk plastic; do not store in damp or wet areas, or in areas where sunlight might bleach veneer; seal top and bottom edges with tinted sealer if stored more than one week, and break seal on site to permit ventilation.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Wood Sound Control Door Assemblies:
 - 1. AMBICO Limited: www.ambico.com/#sle.
 - 2. Overly Door Company: www.overly.com/#sle.
 - 3. Substitutions: See Section 016000 - Product Requirements.

2.02 REGULATORY REQUIREMENTS

- A. Accessibility: Comply with ICC A117.1 and ADA Standards.
- B. Opening Force of Sound Control Doors, Non-Fire Rated: 5 lbs (22.2 N), maximum, in compliance with ADA Standards.
- C. 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.
- D. Combined Requirements: If a particular door and frame unit is indicated to comply with more than one type of requirement, comply with specified requirements for each type; for instance, a sound control door is also indicated as being an exterior door must comply with requirements specified for sound control doors and exterior doors; where two requirements conflict, comply with most stringent.

2.03 COMPONENTS

- A. Door Edge Profile: Manufacturer's standard for application indicated.
- B. Glazed Lights: Factory installed, with removable stops on secure side; sizes and configurations as indicated on drawings.
 - 1. Style: Manufacturer's standard.

2.04 SOUND CONTROL DOORS

- A. Wood Sound Control Interior Doors: Provide fire-rated door construction as indicated.
 - 1. Wood Doors: Refer to drawings for locations and additional requirements.
 - a. Quality Standard: Premium Grade, Extra Heavy Duty performance, in accordance with WDMA I.S. 1A.
 - b. Wood Veneer Faced Doors: 5-ply unless otherwise indicated.
 - 2. Sound Transmission Class (STC) Rating of Sound Control Door Assembly: STC of 50, minimum, calculated in accordance with ASTM E413, and tested in accordance with ASTM E90.
 - 3. Sound Seals: As required by manufacturer to meet indicated sound control ratings.
 - 4. Fire-Rated Doors:
 - a. Fire Rating: As indicated on Door Schedule, complying with NFPA 80 and tested in accordance with UL 10C and NFPA 252 as positive pressure fire tests.
 - b. Provide units listed and labeled by UL (DIR) or ITS (DIR).
 - 1) Attach fire rating label to each fire rated unit.
 - c. Door Core Material: As required by manufacturer to meet indicated fire and sound control ratings.

2.05 SOUND CONTROL DOOR FRAMES

- A. Comply with standards and/or custom guidelines as indicated for corresponding door in accordance with applicable door frame requirements.
- B. Sound Control Interior Door Frames:
 - 1. Frame Finish: Factory finished.
 - 2. Interior Door Frames, Non-Fire Rated:

2.06 DOOR HARDWARE

- A. Hinges: Cam lift type by door manufacturer; see Section 087100.
- B. Threshold: Provide sound control/acoustic seal for sill of door in closed position by door manufacturer.
- C. Sound Control Seals: Provide sound control/acoustic seals for jambs and head of door in closed position by door manufacturer.

2.07 FINISHES

- A. Primer, Metal Doors and Frames: Rust-inhibiting, complying with ANSI/SDI A250.10, door manufacturer's standard, in compliance with local VOC requirements.
- B. Metal Door and Frame Finish: Complying with ANSI/SDI A250.3, manufacturer's standard coating.

2.08 ACCESSORIES

- A. Glazing: See Section 088000, factory installed, and tested to comply with specified sound control and fire ratings as indicated.

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 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. Touch up damaged factory finishes.

3.03 TOLERANCES

- A. Clearances Between Door and Frame: Comply with related requirements of specified frame standards or custom guidelines indicated in accordance with SDI 117 or NAAMM HMMA 865.
- B. Maximum Diagonal Distortion: 1/16 inch (1.6 mm) measured with straight edge, corner to corner.

3.04 FIELD QUALITY CONTROL

- A. See Section 014000 - Quality Requirements for independent field testing and inspection requirements, and requirements for monitoring quality of specified product installations.
- B. Provide field testing of installed sound control doors by independent laboratory in accordance with ASTM E336 test methods, with results calculated in accordance with ASTM E413

and having acceptable field noise isolation class (NIC) values within 5 dB of laboratory STC rating values.

1. Testing agency to submit testing report to Contractor and Architect within 24 hours after field testing has been completed.
- C. Repair or replace sound control door components that have failed designated field testing, and retest to verify performance complies with specified requirements.

3.05 ADJUSTING

- A. Adjust for smooth and balanced sound control door movement.
- B. Adjust sound control doors for force to close, latch, and unlatch; adjust as necessary in compliance with requirements.

3.06 SCHEDULE

- A. Refer to Door and Frame Schedule on drawings.

END OF SECTION

SECTION: 083516 FOLDING GRILLES

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes:

1. Side-folding aluminum grilles.
2. Operating hardware and supports.

B. Related Sections:

1. Division 01: Administrative, procedural, and temporary work requirements.
2. Section 087100 - Door Hardware.

1.02 PERFORMANCE REQUIREMENTS

- A. All locking posts shall allow for horizontal sway without pressure to side walls of track from trollies while opening and closing the curtain.
- B. All post's standard locking hardware and handles shall be flush within post with exceptions for exit hardware.

1.03 REFERENCES

- A. ASTM International (ASTM) B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
- B. AAMA (American Architectural Manufacturers Association):
1. AAMA 2603 - Voluntary Specification, Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels.
 2. AAMA 2604 - Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels.

1.04 SUBMITTALS

A. Submittals for Review:

1. Shop Drawings: Indicate track layout and dimensions including pocket, required curves, types and locations of posts, required locking and hardware, options, finish and installation details.
2. Product Data: Provide information on grille construction, components, materials, and finishes.

- B. Sustainable Design Submittals:
 - 1. Recycled Content.
 - 2. Regional Materials – not applicable.
- C. Closeout Submittals:
 - 1. Operation and Maintenance Data

1.05 WARRANTIES

- A. Provide manufacturer's 2-year warranty against defects in materials and workmanship.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Basis of design: Dynamic Closures Corporation SL154. (www.dynamicclosures.com)
- B. Substitutions: [Under provisions of Division 01.]

2.02 MATERIALS

- A. Aluminum Extrusions: ASTM B221, 6063-T5 or T6 alloy and temper.

2.03 COMPONENTS

- A. Curtain: SL 124 Straight
 - 1. 4 inches [102 mm] wide, truss-like aluminum, with 4 inches [102 mm] high bottom and 4 inches [102 mm] high top plates. Pattern: Straight Stacking depth: 11% of curtain length. Add 3 inches [76mm] per Hook Bolt post, Intermediate post, Top and Bottom post, Travelling post. Add 4 inches [102mm] per Bi-Part post. Curtain and posts have adjustable height of 1/2 inch [13mm] up or down. Clearance width required: 5 inches [127mm] continuous on center of track.
 - 2. Panels connected with one-piece vertical aluminum hinges.
 - 3. Stacking depth: 11% of curtain length. Add 3 inches [76 mm] per hook bolt post, intermediate post, top post, bottom post, and traveling post. Add 4 inches [102 mm] per bi-part post.
 - 4. Curtain and posts have adjustable height of ± 0.5 inch [13 mm].
 - 5. Clearance width required: 5 inches [127 mm] continuous on center of track.
- B. Operation: Manual push/pull. Provide pull straps on openings over 9 feet [2743mm] in height and countertop applications.
- C. Curtain Carriers: Dual bearing trolleys with 1.125 inches [29mm] diameter tires.

- D. Overhead Track: Extruded aluminum, 1.375 inches [35mm] wide x 1.675 inches [43mm] high, continuous profile seamed with alignment bars and track pins at splices.
- E. Curves: Detailed type and location on drawing if required.
- F. Locking Post: Extruded aluminum, all post's standard locking hardware and handles shall be flush within post with exceptions for exit hardware. Locks may be on the public side, secure side or both. All stainless-steel lock rods engage stainless-steel floor or counter sockets. All locking posts shall allow for horizontal sway without pressure to side walls of track from trollies while opening and closing the curtain. Refer to detailed drawing for location and type of posts.
 - 1. Wall Channel: A floor to track extruded aluminum channel that the hook bolt fits and locks into. This channel is secured permanently to the wall.
 - 2. Hook Bolt Lead: This post has a hook bolt that secures it to the Wall Channel. Additional top locking or double hook bolt locking available.
 - 3. Bi-Part: A pair of posts that lock together with a hook bolt with an added lock rod to keep the curtain in place. It is used to separate larger doors into manageable sections, or to split the door to stack in two different directions. The concealed stainless-steel lock rod engages into a floor or counter socket. Doors should have at least one Bi-Part for every 30 feet [9144mm] of width. Top stainless- steel rod locking available.
 - 4. Top & Bottom: Lead or Trailing End option. This post contains spring-loaded stainless-steel lock rods that engage a floor or counter socket with the bottom rod and the top rod engages into the track and header. They are unlocked with a keyed cylinder, thumb turn or paddle, both disengaging in one motion. A rubber bumper is the standard leading edge but may also have 4 inch [102mm] or 7 inch [178mm] flange.
 - 5. Intermediate: A middle post in a door located between door sections, containing a spring-loaded stainless-steel lock rod that engages a floor or counter socket to keep the door in place and unlocked by a keyed cylinder or a thumb turn. Recommended straight line spacing of all posts is 10 feet [3048mm]. Curves and countertop applications will require closer spacing.
 - 6. Traveling End: The Traveling End post terminates a door inside of a pocket (storage area). It is free to travel back and forth inside of the pocket. The post self-locks into permanent header and floor stops that prevent the door from fully leaving the pocket. A rear flange attached to the back of the post prevents reaching around.
 - 7. Fixed End: Simply attaches the end of a door permanently to a wall.
- G. Emergency Egress Door - Detailed latch type and location on drawing if required. Swing out emergency egress door within the curtain providing a clear opening of 79.5 inches [2019mm] high x 34 inches [864mm] wide.
- H. Steel Pocket Door (Interior use only): Optional; Made from 14-gauge formed steel up to 144 inches [3658mm] in height (from finished floor to track support). Covers a standard 8 inch [203mm] pocket opening and includes three durable commercial-grade 4 inch [102mm] butt hinges located on one side for maximum support. Specify left-handed or right-handed operation.
 - 1. Finish: Factory-applied polyester powder-coated finish. Basis of Design: Tiger Drylac Anodized Silver powder.

2. Additional custom powder-coated colors are available, or door may be painted in the field if required.
3. The Pocket Door shall be supplied with a thumb-turn lock or optional keyed cylinder lock matched to the security door.

2.04 FINISHES

A. Aluminum Finishes

1. Clear Anodized Finish: Standard.
2. Black Anodized Effect Powder-Coated Finish: Optional; polyester powder-coated finish formulated to visually replicate the appearance of black anodized aluminum.
3. Additional Powder-Coated Finishes: Optional; including Bronze and White powder-coated finishes as indicated in product data sheets.

B. Powder Coating Performance

1. Application: Powder coatings shall be factory-applied by a qualified applicator in accordance with the coating manufacturer's approved written application, pretreatment, and cure specifications.
2. Performance Requirements: Powder-coated finishes shall meet the performance requirements of AAMA 2603 or AAMA 2604, as applicable, based on the selected color and/or effect and the coating manufacturer's published technical literature.
3. Basis of Design Powder Coating: Polyester powder coating system qualified by the coating manufacturer to meet AAMA performance requirements.
4. Basis of Design: Tiger Drylac. Substitutions are not permitted.
5. AAMA 2604 Limitation: Where AAMA 2604 compliance is specified, the selected color and/or effect shall be one qualified by the coating manufacturer as meeting AAMA 2604 performance requirements when applied in accordance with published specifications.
6. Fallback Performance Standard: Where AAMA 2604 compliance is not achievable due to color or effect limitations, finishes shall meet AAMA 2603 performance requirements.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install assembly in accordance with manufacturer's instructions.
- B. Anchor to adjacent construction without distortion or stress, level and plumb, to provide smooth operation.

3.02 ADJUSTING

- A. Adjust grilles for smooth operation throughout full operating range.

SECTION 084313 - ALUMINUM-FRAMED STOREFRONTS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Aluminum-framed storefront, with vision glass.
- B. Aluminum doors and frames.
- C. SunShade System
- D. Weatherstripping.

1.02 RELATED REQUIREMENTS

- A. Section 079200 - Joint Sealants: Sealing joints between frames and adjacent construction.
- B. Section 087100 - Door Hardware: Hardware items other than specified in this section.
- C. Section 088000 - 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 503 - Voluntary Specification for Field Testing of Newly Installed Storefronts, Curtain Walls and Sloped Glazing Systems; 2014.
- C. AAMA 611 - Specification for Anodized Architectural Aluminum; 2024.
- D. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2021.
- E. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric); 2021.
- F. 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.
- G. 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).
- H. ASTM E1105 - Standard Test Method for Field Determination of Water Penetration of Installed Exterior Windows, Skylights, Doors, and Curtain Walls, by Uniform or Cyclic Static Air Pressure Difference; 2015 (Reapproved 2023).

1.04 SUBMITTALS

- A. See Section 013000 - Administrative Requirements for submittal procedures.

- B. Product Data: Provide component dimensions, describe components within assembly, anchorage and fasteners, glass and infill, door hardware, and internal drainage details.
- C. Shop Drawings: Indicate system dimensions, framed opening requirements and tolerances, affected related work, expansion and contraction joint location and details, and field welding required.
- D. Manufacturer's Certificate: Certify that the products supplied meet or exceed the specified requirements.
- E. Hardware Schedule: Complete itemization of each item of hardware to be provided for each door, cross-referenced to door identification numbers in Contract Documents.
- F. Field Quality Control Submittals: Report of field testing for water penetration and air leakage.
- G. Specimen warranty.

1.05 PERFORMANCE REQUIREMENTS

- A. General Performance: Aluminum-framed systems shall withstand the effects of the following performance requirements without exceeding performance criteria or failure due to defective manufacture, fabrication, installation, or other defects in construction:
 - 1. Movements of supporting structure indicated on Drawings including, but not limited to, story drift and deflection from uniformly distributed and concentrated live loads.
 - 2. Dimensional tolerances of building frame and other adjacent construction.
 - 3. Failure includes the following:
 - a. Deflection exceeding specified limits.
 - b. Thermal stresses transferring to building structure.
 - c. Framing members transferring stresses, including those caused by thermal and structural movements to glazing.
 - d. Glazing-to-glazing contact.
 - e. Noise or vibration created by wind and by thermal and structural movements.
 - f. Loosening or weakening of fasteners, attachments, and other components.
 - g. Sealant failure.
 - h. Failure of operating units.
 - i. Break metal closure units to be securely anchored at all edges, held tight to the substrate and free of deflection.
- B. Delegated Design: Design aluminum-framed systems, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.
 - A. Structural Loads:
 - 1. Wind Loads: As indicated on the Structural Drawings. Design to be produced stamped and sealed by a Structural Engineer registered in the State of Wyoming.

- a. Basic Wind Speed: See above.
 - 2. Seismic Loads: As indicated on Drawings.
 - 3. Blast Loads: As indicated on Drawings.
- C. Deflection of Framing Members:
 - 1. Deflection Normal to Wall Plane: Limited to edge of glass in a direction perpendicular to glass plane shall not exceed $L/175$ of the glass edge length for each individual glazing lite or an amount that restricts edge deflection of individual glazing lites to 3/4 inch (19 mm), whichever is less.
 - 2. Deflection Parallel to Glazing Plane: Limited to $L/360$ of clear span or 1/8 inch (3.2 mm), whichever is smaller.
- D. Structural-Test Performance: Provide aluminum-framed systems tested according to ASTM E 330 as follows:
 - 1. When tested at positive and negative wind-load design pressures, systems do not evidence deflection exceeding specified limits.
 - 2. When tested at 150 percent of positive and negative wind-load design pressures, systems, including anchorage, do not evidence material failures, structural distress, and permanent deformation of main framing members exceeding 0.2 percent of span.
 - 3. Test Durations: As required by design wind velocity, but not fewer than 10 seconds.
- E. Windborne-Debris-Impact-Resistance Performance: Provide aluminum-framed systems that pass standard performance criteria for Gillette, Wyoming, when tested according to ASTM E 1886 and testing information in ASTM E 1996.
- F. Air Infiltration: Provide aluminum-framed systems with maximum air leakage through fixed glazing and framing areas of 0.06 cfm/sq. ft. (0.03 L/s per sq. m) of fixed wall area when tested according to ASTM E 283 at a minimum static-air-pressure difference of 1.6 lbf/sq. ft. (75 Pa).
- G. Water Penetration under Static Pressure: Provide aluminum-framed systems that do not evidence water penetration through fixed glazing and framing areas when tested according to ASTM E 331 at a minimum static-air-pressure difference of 20 percent of positive wind-load design pressure, but not less than 6.24 lbf/sq. ft. (300 Pa).
- H. Thermal Movements: Provide aluminum-framed systems that allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

1. Temperature Change (Range): 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.
 2. Test Performance: No buckling; stress on glass; sealant failure; excess stress on framing, anchors, and fasteners; or reduction of performance when tested according to AAMA 501.5.
 - a. High Exterior Ambient-Air Temperature: That which produces an exterior metal-surface temperature of 180 deg F (82 deg C).
 - b. Low Exterior Ambient-Air Temperature: -10 deg F.
 3. Interior Ambient-Air Temperature: 75 deg F (24 deg C).
- I. Condensation Resistance: Provide aluminum-framed systems with fixed glazing and framing areas having condensation-resistance factor (CRF) of not less than 45 when tested according to AAMA 1503.
- J. Thermal Conductance: Provide aluminum-framed systems with fixed glazing and framing areas having an average U-factor of not more than 0.69 Btu/sq. ft. x h x deg F (3.92 W/sq. m x K) when tested according to AAMA 1503.
- K. Sound Transmission: Provide aluminum-framed systems with fixed glazing and framing areas having the following sound-transmission characteristics:
1. Sound Transmission Class (STC): Minimum 30 STC when tested for laboratory sound transmission loss according to ASTM E 90 and determined by ASTM E 413.
 2. Outdoor-Indoor Transmission Class (OITC): Minimum 30 OITC when tested for laboratory sound transmission loss according to ASTM E 90 and determined by ASTM E 1332.
- L. Structural Sealant: Capable of withstanding tensile and shear stresses imposed by aluminum-framed systems without failing adhesively or cohesively. When tested for preconstruction adhesion and compatibility, cohesive failure of sealant shall occur before adhesive failure.
1. Adhesive failure occurs when sealant pulls away from substrate cleanly, leaving no sealant material behind.
 2. Cohesive failure occurs when sealant breaks or tears within itself but does not separate from each substrate because sealant-to-substrate bond strength exceeds sealant's internal strength.
- M. Structural-Sealant Joints: Designed to produce tensile or shear stress of less than 20 psi (138 kPa).
- N. General: Provide glazed aluminum curtain-wall systems, Versoleil SunShade Outrigger System and Versoleil SunShade Single Blade System including anchorage, capable of withstanding, without failure, the effects of the following:

1.06 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in performing work of type specified and with at least three years of documented experience.

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 (5 degrees C).
- C). Maintain this minimum temperature during and 48 hours after installation.

1.09 WARRANTY

- A. See Section 017800 - Closeout Submittals for additional warranty requirements.
- B. Provide five year manufacturer warranty against failure of glass seal on insulating glass units, including interpane dusting or misting. Include provision for replacement of failed units.
- C. Provide five year manufacturer warranty against excessive degradation of exterior finish. Include provision for replacement of units with excessive fading, chalking, or flaking.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Aluminum-Framed Storefronts:
 - 1. Kawneer North America: www.kawneer.com/#sle.
 - 2. Efco Group: www.efcogroup.com
 - 3. Tubelite, Inc: www.tubeliteinc.com/#sle.

2.02 BASIS OF DESIGN -- FRAMING FOR INSULATING GLAZING

- A. Center-Set Style, Thermally-Broken:
 - 1. Basis of Design: Kawneer 451UT, 2 by 4-1/2 inch Storefront Center-Set Style, Thermally Broken (Larger frames may be required at larger openings dependent on Paragraph 1.05)
- B. Center-Set Style, Not Thermally-Broken:
 - 1. Basis of Design: Kawneer 450 @ Interior Locations.

2.03 BASIS OF DESIGN -- SWINGING DOORS

- A. Wide Stile, Insulating Glazing, Thermally-Broken:
 - 1. Basis of Design: Kawneer # 500 Heavy Wall Entrances.
 - 2. Thickness: 2 inches (51 mm).

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: Superior performing organic coatings.
 - a. Factory finish all surfaces that will be exposed in completed assemblies.
 - b. Touch-up surfaces cut during fabrication so that no natural aluminum is visible in completed assemblies, including joint edges.
 - 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 (95 degrees C) 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.
- 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 (0.3 L/sec sq m) maximum leakage of storefront wall area when tested in accordance with ASTM E283/E283M at 1.57 psf (75 Pa) 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.

2.06 Glazing: See Section 088000.

2.07 EXTERIOR SUN CONTROL DEVICES

- A. Basis of Design: Versoleil SunShade – Outrigger System by Kawneer. Other manufacturers may be acceptable provided their system is compatible with the curtain wall system or storefront system being utilized and they meet project requirements.
1. Outrigger size – 30"
 2. Materials:
 - a. Aluminum Extrusions: Alloy and temper recommended by glazed aluminum curtain wall and storefront system manufacturer for strength, corrosion resistance, and application of required finish and not less than 0.070" wall thickness at any location for the main frame and complying with ASTM B 221: 6063-T6, 6105-T5, or 6061-T6 alloy and temper.
 - b. Thermal Barrier: When applied on a thermally broken captured system, sunshade shall be thermally isolated from the interior aluminum mullions by a nominal 0.25" (6.3 mm) thick low conductance material.
 - c. Aluminum sheet alloy: Shall meet the requirements of ASTM B209.
 - d. Sealant: For sealants required within fabricated sunshade system, provide permanently elastic, non-shrinking, and non-migrating type recommended by sealant manufacturer for joint size and movement.
 - e. Tolerances: Reference to tolerances for wall thickness and other cross-sectional dimensions of glazed curtain wall and storefront members are nominal and in compliance with AA Aluminum Standards and Data.
 3. Sunshades
 - a. Sunshade Members: Manufacturer's standard extruded or formed-aluminum framing members of thickness required and reinforced as required to support imposed loads.
 - b. Fasteners and accessories: Nonmagnetic stainless steel to be non-corrosive and compatible with aluminum members, anchors, and other components.
 - c. Perimeter Anchors: When steel anchors are used, provide insulation between steel material and aluminum material to prevent galvanic action.
 - d. Packing, Shipping, Handling and Unloading: Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.
 - e. Storage and Protection: Store materials protected from exposure to harmful weather conditions. Handle sunshade materials and components to avoid damage. Protect sunshade materials against damage from elements, construction activities, and other hazards before, during and after installation.
 4. Fabrication
 - a. Form or extrude aluminum shapes before finishing.
 - b. Fabricate components that, when assembled, have the following characteristics:
 - c. Profiles that are straight, and free of defects or deformations.
 - d. Accurately fitted joints with ends coped or mitered.
 - e. Physical and thermal isolation of glazing from framing members.
 - f. Accommodations for thermal and mechanical movements of glazing and framing to maintain required glazing edge clearances.

- g. Fasteners, anchors, and connection devices that are concealed from view to greatest extent possible.
- 5. Finish
 - a. Kawneer Permanodic Architectural Class 1 Clear Anodic Coating
- B. Basis of Design: Versoleil SunShade – Single Blade System by Kawneer. Other manufacturers may be acceptable provided their system is compatible with the curtain wall system being utilized and they meet project requirements.
 - 1. Materials:
 - a. Aluminum Extrusions: Alloy and temper recommended by glazed aluminum curtain wall and storefront system manufacturer for strength, corrosion resistance, and application of required finish and not less than 0.070" (1.8 mm) wall thickness at any location for the main frame and complying with ASTM B 221: 6063-T6, 6105-T5, or 6061-T6 alloy and temper.
 - b. Thermal Barrier: When applied on a thermally broken compatible system, sunshade shall be thermally isolated from the interior aluminum mullions by a nominal 0.25" (6.3 mm) thick low conductance material.
 - c. Aluminum sheet alloy: Shall meet the requirements of ASTM B209.
 - d. Sealant: For sealants required within fabricated sunshade system, provide permanently elastic, non-shrinking, and non-migrating type recommended by sealant manufacturer for joint size and movement.
 - e. Tolerances: Reference to tolerances for wall thickness and other cross-sectional dimensions of glazed curtain wall and storefront members are nominal and in compliance with AA Aluminum Standards and Data.
 - 2. Sunshades:
 - a. Sunshade Members: Manufacturer's standard extruded or formed-aluminum framing members of thickness required and reinforced as required to support imposed loads.
 - b. Fasteners and Accessories: Manufacturer's standard corrosion-resistant, nonstaining, nonbleeding fasteners and accessories compatible with adjacent materials. Where exposed shall be stainless steel.
 - c. Perimeter Anchors: When steel anchors are used, provide insulation between steel material and aluminum material to prevent galvanic action.
 - d. Packing, Shipping, Handling and Unloading: Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.
 - e. Storage and Protection: Store materials protected from exposure to harmful weather conditions. Handle sunshade materials and components to avoid damage. Protect sunshade materials against damage from elements, construction activities, and other hazards before, during and after installation.
 - 3. Fabrication:
 - a. Form or extrude aluminum shapes before finishing.
 - b. Fabricate components that, when assembled, have the following characteristics:
 - 1) Profiles that are straight, and free of defects or deformations.
 - 2) Accurately fitted joints with ends coped or mitered.
 - 3) Physical and thermal isolation of glazing from framing members.
 - 4) Accommodations for thermal and mechanical movements of glazing and framing to maintain required glazing edge clearances.

- 5) Fasteners, anchors, and connection devices that are concealed from view to greatest extent possible.
- c. Sunshade: Fabricate components for assembly following approved shop drawings and/or manufacturer's standard installation instructions.
- d. After fabrication, clearly mark components to identify their locations in Project according to approved shop drawings
- 4. Finish:
- C. Kawnear Permanodic Architectural Class 1 Clear Anodic Coating

2.08 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.

2.09 FINISHES

- A. Class I Natural Anodized Finish: AAMA 611 AA-M12C22A41 Clear anodic coating not less than 0.7 mils (0.018 mm) thick.
- B. Color: As selected by Architect from manufacturer's standard range.

2.10 HARDWARE

- A. For each door, include weatherstripping, sill sweep strip, and threshold.
- B. Other Door Hardware: See Section 087100.
- C. Weatherstripping: Wool pile, continuous and replaceable; provide on all doors.
- D. Sill Sweep Strips: Resilient seal type, retracting, of neoprene; provide on all doors.
- E. Threshold: Extruded aluminum, one piece per door opening, ribbed surface; provide on all doors.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify dimensions, tolerances, and method of attachment with other work.
- B. Verify that 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. Set thresholds in bed of sealant and secure.
- J. Touch-up minor damage to factory applied finish; replace components that cannot be satisfactorily repaired.

3.03 TOLERANCES

- A. Maximum Variation from Plumb: 0.06 inch per 3 feet (1.5 mm per m) non-cumulative or 0.06 inch per 10 feet (1.5 mm per 3 m), whichever is less.
- B. Maximum Misalignment of Two Adjoining Members Abutting in Plane: 1/32 inch (0.8 mm).

3.04 FIELD QUALITY CONTROL

- A. See Section 014000 - Quality Requirements for independent field testing and inspection requirements, and requirements for monitoring quality of specified product installations.
- B. Provide field testing of installed storefront system by independent laboratory in accordance with AAMA 503 during construction process and before installation of interior finishes.
 - 1. Perform a minimum of two tests in each designated area as indicated on drawings.
 - 2. Conduct tests in each area prior to 10 percent and 50 percent completion of this work.
 - 3. Field test for water penetration in accordance with ASTM E1105 with uniform static air pressure difference (Procedure A) not less than 4.18 psf (200 Pa).
 - a. Maximum allowable rate of water penetration in 15-minute test is 0.5 ounce (14 gram) that is not contained in an area with provisions to drain to exterior, or collected on surface of interior horizontal framing member.
- C. Repair or replace storefront components that have failed designated field testing, and retest to verify performance complies with specified requirements.

3.05 ADJUSTING

- A. Adjust operating hardware and sash for smooth operation.

3.06 CLEANING

- A. Remove protective material from pre-finished aluminum surfaces.

3.07 PROTECTION

- A. Protect installed products from damage until Date of Substantial Completion.

END OF SECTION

SECTION 084413 - GLAZED ALUMINUM CURTAIN WALLS

PART 1 GENERAL

1.01 Section Includes

- A. Aluminum-framed curtain wall, with vision glazing and infill panels.
- B. SunShade System

1.02 Related Requirements

- A. Section 033000 - Cast-in-Place Concrete: Weld plates embedded in concrete for attachment of anchors.
- B. Section 051200 - Structural Steel Framing: Steel attachment members.
- C. Section 055000 - Metal Fabrications: Steel attachment devices.
- D. Section 079200 - Joint Sealants: Sealing joints between frames and adjacent construction.
- E. Section 084313 - Aluminum-Framed Storefronts: Entrance framing and doors.
- F. Section 088000 - Glazing.

1.03 Reference Standards

- A. AAMA CW-10 - Care and Handling of Architectural Aluminum from Shop to Site; 2015.
- B. AAMA 501.2 - Quality Assurance and Diagnostic Water Leakage Field Check of Installed Storefronts, Curtain Walls, and Sloped Glazing Systems; 2025.
- C. AAMA 503 - Voluntary Specification for Field Testing of Newly Installed Storefronts, Curtain Walls and Sloped Glazing Systems; 2014.
- D. AAMA 611 - Specification for Anodized Architectural Aluminum; 2024.
- E. ASCE 7 - Minimum Design Loads and Associated Criteria for Buildings and Other Structures; Most Recent Edition Cited by Referring Code or Reference Standard.
- F. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2021.
- G. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric); 2021.
- H. 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.
- I. ASTM E1105 - Standard Test Method for Field Determination of Water Penetration of Installed Exterior Windows, Skylights, Doors, and Curtain Walls, by Uniform or Cyclic Static Air Pressure Difference; 2015 (Reapproved 2023).

1.04 Administrative Requirements

- A. 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 013000 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide component dimensions, describe components within assembly, anchorage and fasteners, internal drainage details, glazing, and infill.
- C. Shop Drawings: Indicate system dimensions, framed opening requirements and tolerances, affected related Work, expansion and contraction joint location and details, and field welding required.
- D. Samples: Submit two samples illustrating finished aluminum surface, glazing, infill panels, and glazing materials.
- E. Field Quality Control Submittals: Report of field testing for water penetration and air leakage.
- F. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

1.06 PERFORMANCE REQUIREMENTS

- A. General: Provide glazed aluminum curtain-wall systems, Versoleil SunShade Outrigger System and Versoleil SunShade Single Blade System including anchorage, capable of withstanding, without failure, the effects of the following:
 - 1. Structural loads.
 - 2. Thermal movements.
 - 3. Movements of supporting structure indicated on Drawings including, but not limited to, story drift, twist, column shortening, long-term creep, and deflection from uniformly distributed and concentrated live loads.
 - 4. Dimensional tolerances of building frame and other adjacent construction.
 - 5. Failure includes the following:
 - a. Deflection exceeding specified limits.
 - b. Thermal stresses transferred to building structure.
 - c. Framing members transferring stresses, including those caused by thermal and structural movements, to glazing.
 - d. Noise or vibration created by wind and thermal and structural movements.
 - e. Loosening or weakening of fasteners, attachments, and other components.
 - f. Sealant failure.
- B. Structural Loads:

1. Wind Loads: As indicated on Structural Drawings and criteria of the International Building Code 2024, as adopted by the State of Wyoming. Design to be produced, stamped and sealed by a Structural Engineer registered in the State of Wyoming
 2. Seismic Loads: As indicated on Drawings.
 3. Periodic Maintenance-Equipment Loads: As indicated on Drawings.
- C. Structural-Test Performance: Provide glazed aluminum curtain-wall systems tested according to ASTM E 330 as follows:
1. When tested at positive and negative wind-load design pressures, systems do not evidence deflection exceeding specified limits.
 2. When tested at 150 percent of positive and negative wind-load design pressures, systems, including anchorage, do not evidence material failures, structural distress, and permanent deformation of main framing members exceeding 0.2 percent of span.
 3. Test Duration: As required by design wind velocity but not less than 10 seconds.
- D. Deflection of Framing Members:
1. Deflection Normal to Wall Plane: Limited to 1/175 of clear span for spans up to 13 feet 6 inches and to 1/240 of clear span plus 1/4 inch for spans greater than 13 feet 6 inches or an amount that restricts edge deflection of individual glazing lites to 3/4 inch, whichever is less.
 2. Deflection Parallel to Glazing Plane: Limited to 1/360 of clear span or 1/8 inch, whichever is smaller.
 3. Cantilever Deflection: Where framing members overhang an anchor point, limited to 2 times the length of cantilevered member, divided by 175.
- E. Thermal Movements: Provide glazed aluminum curtain-wall systems that allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
1. Temperature Change (Range): 120 deg F, ambient; 180 deg F, material surfaces.
 2. Test Performance: No buckling, stress on glass, glazing-edge seal failure, sealant failure, excess stress on curtain-wall framing, anchors and fasteners, or reduction of performance when tested according to AAMA 501.5.
 - a. Test High Exterior Ambient Air Temperature: That which produces an exterior metal surface temperature of 180 deg F.
 - b. Test Low Exterior Ambient Air Temperature: -10 deg F.
 - c. Test Interior Ambient Air Temperature: 75 deg F.
- F. Air Infiltration: Provide glazed aluminum curtain-wall systems with maximum air leakage of 0.06 cfm/sq. ft. of fixed wall area when tested according to ASTM E 283 at a minimum static-air-pressure differential of 1.57 lbf/sq. ft.

- G. Water Penetration Under Static Pressure: Provide aluminum glazed curtain-wall systems that do not evidence water penetration when tested according to ASTM E 331 at a minimum differential static pressure of 20 percent of positive design wind load, but not less than 10 lbf/sq. ft.
- H. Water Penetration Under Dynamic Pressure: Provide glazed aluminum curtain-wall systems that do not evidence water leakage when tested according to AAMA 501.1 under dynamic pressure equal to 20 percent of positive design wind load, but not less than 10 lbf/sq. ft.
 - 1. Maximum Water Leakage: No uncontrolled water penetrating systems or appearing on systems' normally exposed interior surfaces from sources other than condensation. Water controlled by flashing and gutters that is drained to exterior and cannot damage adjacent materials or finishes is not considered water leakage.
- I. Condensation Resistance: Provide glazed aluminum curtain-wall systems with condensation-resistance factor (CRF) of not less than 55 when tested according to AAMA 1503.
- J. Average Thermal Conductance: Provide glazed aluminum curtain-wall systems with average U-factor of not more than 0.66 Btu/sq. ft. x h x deg F when tested according to AAMA 1503.
- K. Sound Transmission: Provide glazed aluminum curtain-wall systems with minimum STC 32 according to ASTM E 413 and an OITC 26 according to ASTM E 1332, as determined by testing according to ASTM E 90

1.07 Quality Assurance

- A. Designer Qualifications: Design curtain wall and its structural support framing components under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed at the State in which the Project is located.
- B. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with not less than three years of documented experience.
- C. Installer Qualifications: Company specializing in performing work of type specified and with at least three years of documented experience.

1.08 Delivery, Storage, and Handling

- A. Handle products of this section in accordance with AAMA CW-10.
- B. Protect finished aluminum surfaces with wrapping. Do not use adhesive papers or sprayed coatings that bond to aluminum when exposed to sunlight or weather.

1.09 Field Conditions

- A. Do not install sealants when ambient temperature is less than 40 degrees F (5 degrees
- C). Maintain this minimum temperature during and 48 hours after installation.

1.10 Warranty

- A. See Section 017800 - Closeout Submittals for additional warranty requirements.
- B. Manufacturer Warranty: Provide 5-year manufacturer warranty against failure of glass seal on insulating glass units, including interpane dusting or misting. Include provision for replacement of failed units. Complete forms in Owner's name and register with installer.
- C. Finish Warranty: Provide 5-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 Manufacturers

- A. Glazed Aluminum Curtain Walls Manufacturers:
 - 1. Kawneer North America;1600UT Wall System 1: www.kawneer.com/#sle.
 - 2. Efcogroup: www.efcogroup.com
 - 3. Tubelite, Inc: www.tubeliteinc.com/#sle.

2.02 Curtain Wall

- A. Aluminum-Framed Curtain Wall: Factory fabricated, factory finished aluminum framing members with infill, and related flashings, anchorage and attachment devices.
 - 1. Finish: Class I natural anodized.
 - a. Factory finish surfaces that will be exposed in completed assemblies.
 - b. Coat concealed metal surfaces that will be in contact with cementitious materials or dissimilar metals with bituminous paint.
 - 2. Provide flush joints and corners, weathersealed, accurately fitted and secured; prepared to receive anchors; fasteners and attachments concealed from view; reinforced as required for imposed loads.
 - 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.

2.03 Components

- A. Aluminum Framing Members: Tubular aluminum sections, thermally broken with interior section insulated from exterior, drainage holes and internal weep drainage system.
- B. Glazing: See Section 088000.

2.04 Materials

- A. Extruded Aluminum: ASTM B221 (ASTM B221M).
- B. Glazing Gaskets: Type to suit application to achieve weather, moisture, and air infiltration requirements.
- C. Glazing Accessories: See Section 088000.

2.05 EXTERIOR SUN CONTROL DEVICES

- A. Basis of Design: Versoleil SunShade – Outrigger System by Kawneer. Other manufacturers may be acceptable provided their system is compatible with the curtain wall system or storefront system being utilized and they meet project requirements.
 - 1. Outrigger size – 30"
 - 2. Materials:
 - a. Aluminum Extrusions: Alloy and temper recommended by glazed aluminum curtain wall and storefront system manufacturer for strength, corrosion resistance, and application of required finish and not less than 0.070" wall thickness at any location for the main frame and complying with ASTM B 221: 6063-T6, 6105-T5, or 6061-T6 alloy and temper.
 - b. Thermal Barrier: When applied on a thermally broken captured system, sunshade shall be thermally isolated from the interior aluminum mullions by a nominal 0.25" (6.3 mm) thick low conductance material.
 - c. Aluminum sheet alloy: Shall meet the requirements of ASTM B209.
 - d. Sealant: For sealants required within fabricated sunshade system, provide permanently elastic, non-shrinking, and non-migrating type recommended by sealant manufacturer for joint size and movement.
 - e. Tolerances: Reference to tolerances for wall thickness and other cross-sectional dimensions of glazed curtain wall and storefront members are nominal and in compliance with AA Aluminum Standards and Data.
 - 3. Sunshades
 - a. Sunshade Members: Manufacturer's standard extruded or formed-aluminum framing members of thickness required and reinforced as required to support imposed loads.
 - b. Fasteners and accessories: Nonmagnetic stainless steel to be non-corrosive and compatible with aluminum members, anchors, and other components.
 - c. Perimeter Anchors: When steel anchors are used, provide insulation between steel material and aluminum material to prevent galvanic action.
 - d. Packing, Shipping, Handling and Unloading: Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.

- e. Storage and Protection: Store materials protected from exposure to harmful weather conditions. Handle sunshade materials and components to avoid damage. Protect sunshade materials against damage from elements, construction activities, and other hazards before, during and after installation.
 - 4. Fabrication
 - a. Form or extrude aluminum shapes before finishing.
 - b. Fabricate components that, when assembled, have the following characteristics:
 - c. Profiles that are straight, and free of defects or deformations.
 - d. Accurately fitted joints with ends coped or mitered.
 - e. Physical and thermal isolation of glazing from framing members.
 - f. Accommodations for thermal and mechanical movements of glazing and framing to maintain required glazing edge clearances.
 - g. Fasteners, anchors, and connection devices that are concealed from view to greatest extent possible.
 - 5. Finish
 - a. Kawneer Permanodic Architectural Class 1 Clear Anodic Coating
- B. Basis of Design: Versoleil SunShade – Single Blade System by Kawneer. Other manufacturers may be acceptable provided their system is compatible with the curtain wall system being utilized and they meet project requirements.
- 1. Materials:
 - a. Aluminum Extrusions: Alloy and temper recommended by glazed aluminum curtain wall and storefront system manufacturer for strength, corrosion resistance, and application of required finish and not less than 0.070" (1.8 mm) wall thickness at any location for the main frame and complying with ASTM B 221: 6063-T6, 6105-T5, or 6061-T6 alloy and temper.
 - b. Thermal Barrier: When applied on a thermally broken compatible system, sunshade shall be thermally isolated from the interior aluminum mullions by a nominal 0.25" (6.3 mm) thick low conductance material.
 - c. Aluminum sheet alloy: Shall meet the requirements of ASTM B209.
 - d. Sealant: For sealants required within fabricated sunshade system, provide permanently elastic, non-shrinking, and non-migrating type recommended by sealant manufacturer for joint size and movement.
 - e. Tolerances: Reference to tolerances for wall thickness and other cross-sectional dimensions of glazed curtain wall and storefront members are nominal and in compliance with AA Aluminum Standards and Data.
 - 2. Sunshades:
 - a. Sunshade Members: Manufacturer's standard extruded or formed-aluminum framing members of thickness required and reinforced as required to support imposed loads.
 - b. Fasteners and Accessories: Manufacturer's standard corrosion-resistant, nonstaining, nonbleeding fasteners and accessories compatible with adjacent materials. Where exposed shall be stainless steel.
 - c. Perimeter Anchors: When steel anchors are used, provide insulation between steel material and aluminum material to prevent galvanic action.
 - d. Packing, Shipping, Handling and Unloading: Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.
 - e. Storage and Protection: Store materials protected from exposure to harmful weather conditions. Handle sunshade materials and components to avoid damage. Protect

sunshade materials against damage from elements, construction activities, and other hazards before, during and after installation.

3. Fabrication:
 - a. Form or extrude aluminum shapes before finishing.
 - b. Fabricate components that, when assembled, have the following characteristics:
 - 1) Profiles that are straight, and free of defects or deformations.
 - 2) Accurately fitted joints with ends coped or mitered.
 - 3) Physical and thermal isolation of glazing from framing members.
 - 4) Accommodations for thermal and mechanical movements of glazing and framing to maintain required glazing edge clearances.
 - 5) Fasteners, anchors, and connection devices that are concealed from view to greatest extent possible.
 - c. Sunshade: Fabricate components for assembly following approved shop drawings and/or manufacturer's standard installation instructions.
 - d. After fabrication, clearly mark components to identify their locations in Project according to approved shop drawings
4. Finish:
 - a. Kawneer Permanodic Architectural Class 1 Clear Anodic Coating

2.06 Finishes

- A. Class I Natural Anodized Finish: AAMA 611 AA-M12C22A41 Clear anodic coating not less than 0.7 mils (0.018 mm) thick.

PART 3 EXECUTION

3.01 Examination

- A. Verify dimensions, tolerances, and method of attachment with other related work.
- B. Verify that curtain wall openings and adjoining water-resistive and air barrier seal materials are ready to receive work of this section.
- C. Verify that anchorage devices have been properly installed and located.

3.02 Installation

- A. Install curtain wall system in accordance with manufacturer's instructions.
- B. Attach to structure to permit sufficient adjustment to accommodate construction tolerances and other irregularities.
- C. Provide alignment attachments and shims to permanently fasten system to building structure.
- D. Align assembly plumb and level, free of warp or twist. Maintain assembly dimensional tolerances, aligning with adjacent work.
- E. Provide thermal isolation where components penetrate or disrupt building insulation.

- F. Install sill flashings. Turn up ends and edges; seal to adjacent work to form water tight dam.
- G. Touch-up minor damage to factory applied finish; replace components that cannot be satisfactorily repaired.

3.03 Tolerances

- A. Maximum Variation from Plumb: 0.06 inch per 3 feet (1.5 mm/m) noncumulative or 0.5 inches per 100 feet (12 mm/30 m), whichever is less.
- B. Maximum Misalignment of Two Adjoining Members Abutting in Plane: 1/32 inch (0.8 mm).
- C. Sealant Space Between Curtain Wall Mullions and Adjacent Construction: Maximum of 3/4 inch (19 mm) and minimum of 1/4 inch (6 mm).

3.04 Field Quality Control

- A. See Section 014000 - Quality Requirements for independent field testing and inspection requirements, and requirements for monitoring quality of specified product installations.
- B. Water-Spray Test: Provide water spray quality test of installed curtain wall components in accordance with AAMA 501.2 during construction process and before installation of interior finishes.
 - 1. Perform a minimum of two tests in each designated area as indicated on drawings.
 - 2. Conduct tests in each area prior to 10 percent and 50 percent completion of this work.
- C. Provide field testing of installed curtain wall system by independent laboratory in accordance with AAMA 503 during construction process and before installation of interior finishes.
 - 1. Perform a minimum of two tests in each designated area as indicated on drawings.
 - 2. Conduct tests in each area prior to 10 percent and 50 percent completion of this work.
 - 3. Field test for water penetration in accordance with ASTM E1105 with uniform static air pressure difference (Procedure A) not less than 4.18 psf (200 Pa).
 - a. Maximum allowable rate of water penetration in 15-minute test is 0.5 ounce (14 gram) that is not contained in an area with provisions to drain to exterior, or collected on surface of interior horizontal framing member.
- D. Repair or replace curtain wall components that have failed designated field testing, and retest to verify performance complies with specified requirements.

3.05 Adjusting

- A. Adjust operating sash for smooth operation.

3.06 Cleaning

- A. See Section 017000 - Execution and Closeout Requirements for additional requirements.
- B. Remove protective material from pre-finished aluminum surfaces.

3.07 Protection

- A. Protect installed products from damage until mm-dd-yyyy.

END OF SECTION

SECTION 087100 - DOOR HARDWARE

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes:

1. Mechanical and electrified door hardware
2. Electronic access control system components

B. Section excludes:

1. Windows
2. Cabinets (casework), including locks in cabinets
3. Signage
4. Toilet accessories
5. Overhead doors

C. Related Sections:

1. Division 01 "General Requirements" sections for Allowances, Alternates, Owner Furnished Contractor Installed, Project Management and Coordination.
2. Division 06 Section "Rough Carpentry"
3. Division 06 Section "Finish Carpentry"
4. Division 07 Section "Joint Sealants" for sealant requirements applicable to threshold installation specified in this section.
5. Division 08 Sections:
 - a. "Metal Doors and Frames"
 - b. "Flush Wood Doors"
 - c. "Stile and Rail Wood Doors"
 - d. "Interior Aluminum Doors and Frames"
 - e. "Aluminum-Framed Entrances and Storefronts"
 - f. "Stainless Steel Doors and Frames"
 - g. "Special Function Doors"
 - h. "Entrances"
6. Division 26 "Electrical" sections for connections to electrical power system and for low-voltage wiring.
7. Division 28 "Electronic Safety and Security" sections for coordination with other components of electronic access control system and fire alarm system.

1.02 REFERENCES

A. UL LLC

1. UL 10B - Fire Test of Door Assemblies
2. UL 10C - Positive Pressure Test of Fire Door Assemblies
3. UL 1784 - Air Leakage Tests of Door Assemblies
4. UL 305 - Panic Hardware

B. DHI - Door and Hardware Institute

1. Sequence and Format for the Hardware Schedule
2. Recommended Locations for Builders Hardware
3. Keying Systems and Nomenclature
4. Installation Guide for Doors and Hardware

C. NFPA – National Fire Protection Association

1. NFPA 70 – National Electric Code
2. NFPA 80 – 2016 Edition – Standard for Fire Doors and Other Opening Protectives
3. NFPA 101 – Life Safety Code
4. NFPA 105 – Smoke and Draft Control Door Assemblies
5. NFPA 252 – Fire Tests of Door Assemblies

D. ANSI - American National Standards Institute

1. ANSI A117.1 – 2017 Edition – Accessible and Usable Buildings and Facilities
2. ANSI/BHMA A156.1 - A156.29, and ANSI/BHMA A156.31 - Standards for Hardware and Specialties
3. ANSI/BHMA A156.28 - Recommended Practices for Keying Systems
4. ANSI/WDMA I.S. 1A - Interior Architectural Wood Flush Doors
5. ANSI/SDI A250.8 - Standard Steel Doors and Frames

1.03 SUBMITTALS

A. General:

1. Submit in accordance with Conditions of Contract and Division 01 Submittal Procedures.
2. Prior to forwarding submittal:
 - a. Review drawings and Sections from related trades to verify compatibility with specified hardware.
 - b. Highlight, encircle, or otherwise specifically identify on submittals: deviations from Contract Documents, issues of incompatibility or other issues which may detrimentally affect the Work.

B. Action Submittals:

1. Product Data: Submit technical product data for each item of door hardware, installation instructions, maintenance of operating parts and finish, and other information necessary to show compliance with requirements.
2. 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 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.
3. 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.

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. Single Source Responsibility: Obtain each type of door hardware from single manufacturer.

B. Pre-Installation Meetings

1. Keying Conference
 - a. Incorporate keying conference decisions into final keying schedule after reviewing door hardware keying system including:
 - 1) Function of building, flow of traffic, purpose of each area, degree of security required, and plans for future expansion.
 - 2) Preliminary key system schematic diagram.
 - 3) Requirements for key control system.
 - 4) Requirements for access control.
 - 5) Address for delivery of keys.
2. Pre-installation Conference
 - a. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
 - b. Inspect and discuss preparatory work performed by other trades.
 - c. Inspect and discuss electrical roughing-in for electrified door hardware.
 - d. Review sequence of operation for each type of electrified door hardware.
 - e. Review required testing, inspecting, and certifying procedures.
 - f. Review questions or concerns related to proper installation and adjustment of door hardware.
3. Electrified Hardware Coordination Conference:
 - a. Prior to ordering electrified hardware, schedule and hold meeting to coordinate door hardware with security, electrical, doors and frames, and other related suppliers.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Inventory door hardware on receipt and provide secure lock-up for hardware delivered to Project site. Promptly replace products damaged during shipping
- B. Tag each item or package separately with identification coordinated with final door hardware schedule, and include installation instructions, templates, and necessary fasteners with each item or package. Deliver each article of hardware in manufacturer's original packaging.
- C. Maintain manufacturer-recommended environmental conditions throughout storage and installation periods.
- D. Provide secure lock-up for door hardware delivered to Project. Control handling and installation of hardware items so that completion of Work will not be delayed by hardware losses both before and after installation.
- E. Handle hardware in manner to avoid damage, marring, or scratching. Correct, replace or repair products damaged during Work. Protect products against malfunction due to paint, solvent, cleanser, or any chemical agent.

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.

1.08 MAINTENANCE

- A. 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.
2. Exit devices: install with thru bolts at all wood and hollow metal doors.
3. Door closers: install with thru bolts at all wood and hollow metal doors.

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: Standard weight, bronze or stainless steel, 4-1/2 inches (114 mm) high
 - b. Interior: Standard weight, steel, 4-1/2 inches (114 mm) high
4. 1-3/4 inch (44 mm) thick doors over 36 inches (914 mm) wide:
 - a. Exterior: Heavy weight, bronze/stainless steel, 5 inches (127 mm) high
 - b. Interior: Heavy weight, steel, 5 inches (127 mm) high
5. 2 inches or thicker doors:
 - a. Exterior: Heavy weight, bronze or stainless steel, 5 inches (127 mm) high
 - b. Interior: Heavy weight, steel, 5 inches (127 mm) high
6. Adjust hinge width for door, frame, and wall conditions to allow proper degree of opening.
7. Provide heavy-weight hinges at all doors with exit devices or push/ pull hardware.
8. 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.
9. Provide heavy-weight hinges at doors with exit devices and push/ pull hardware.
10. Where new hinges are specified for existing doors or existing frames, provide new hinges of identical size to hinge preparation present in existing door or existing frame.
11. Hinge Pins: Except as otherwise indicated, provide hinge pins as follows:

- a. Steel Hinges: Steel pins
- b. Non-Ferrous Hinges: Stainless steel pins
- c. Out-Swinging Exterior Doors: Non-removable pins
- d. Out-Swinging Interior Lockable Doors: Non-removable pins
- e. Interior Non-lockable Doors: Non-rising pins

12. 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. ABH

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 MORTISE LOCKS

A. Manufacturers and Products:

- 1. Scheduled Manufacturer and Product:
 - a. Schlage L9000 Series
- 2. Acceptable Manufacturers and Products:
 - a. Corbin-Russwin ML2000 series

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. Provide locks manufactured from heavy gauge steel, containing components of steel with a zinc dichromate plating for corrosion resistance.
3. Provide lock case that is multi-function and field reversible for handing without opening case. Cylinders: Refer to "KEYING" article, herein.
4. 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.
5. Provide standard ASA strikes unless extended lip strikes are necessary to protect trim.
6. Provide electrified options as scheduled in the hardware sets. Where scheduled, provide a request to exit (RX) switch that is actuated with rotation of inside lever.
7. 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.

2.06 EXIT DEVICES

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product:
 - a. Von Duprin 99 series
2. Acceptable Manufacturers and Products:
 - a. No Substitute

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 grooved 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.

2.07 CYLINDERS

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product:
 - a. Schlage Everest 29 T
2. Acceptable Manufacturers and Products:
 - a. No Substitute

B. Requirements:

1. Provide cylinders/cores 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. Provide cylinders in the below-listed configuration(s), distributed throughout the Project as indicated.
 - a. Patented Restricted: cylinder with interchangeable core with patented, restricted keyway.
3. Patent Protection: Cylinders/cores requiring use of restricted, patented keys, patent protected.
4. Nickel silver bottom pins.

2.08 KEYING

A. Scheduled System:

1. Existing factory registered system:
 - a. Provide cylinders/cores keyed into Owner's existing factory registered keying system. Comply with guidelines in ANSI/BHMA A156.28, incorporating decisions made at keying conference.

B. Requirements:

1. Construction Keying:
 - a. 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)
 - 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."
- 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.

2.09 DOOR CLOSERS

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product:
 - a. LCN 4040XP series
2. Acceptable Manufacturers and Products:
 - a. No Substitute

B. Requirements:

1. Provide door closers conforming to ANSI/BHMA A156.4 Grade 1 requirements by BHMA certified independent testing laboratory. ISO 9000 certify closers. Stamp units with date of manufacture code.
2. Provide door closers with fully hydraulic, full rack and pinion action with high strength cast iron cylinder, and full complement bearings at shaft.
3. Cylinder Body: 1-1/2-inch (38 mm) diameter piston with 5/8-inch (16 mm) diameter double heat-treated pinion journal. QR code with a direct link to maintenance instructions.
4. Hydraulic Fluid: Fireproof, passing requirements of UL10C, and requiring no seasonal closer adjustment for temperatures ranging from 120 degrees F to -30 degrees F.
5. Spring Power: Continuously adjustable over full range of closer sizes, and providing reduced opening force as required by accessibility codes and standards. Provide snap-on cover clip, with plastic covers, that secures cover to spring tube.
6. Hydraulic Regulation: By tamper-proof, non-critical valves, with separate adjustment for latch speed, general speed, and backcheck. Provide graphically labelled instructions on the closer body adjacent to each adjustment valve. Provide positive stop on reg valve that prevents reg screw from being backed out.
7. Provide closers with solid forged steel main arms and factory assembled heavy-duty forged forearms for parallel arm closers.
8. Pressure Relief Valve (PRV) Technology: Not permitted.
9. Finish for Closer Cylinders, Arms, Adapter Plates, and Metal Covers: Powder coating finish which has been certified to exceed 100 hours salt spray testing as described in ANSI Standard A156.4 and ASTM B117, or has special rust inhibitor (SRI).
10. Provide special templates, drop plates, mounting brackets, or adapters for arms as required for details, overhead stops, and other door hardware items interfering with closer mounting.
11. Closers shall be capable of being upgraded by adding modular mechanical or electronic components in the field.

2.10 ELECTRO-HYDRAULIC AUTOMATIC OPERATORS

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product:
 - a. LCN 4600 series
2. Acceptable Manufacturers and Products:
 - a. No Substitute

B. Requirements:

1. Provide low energy automatic operator units with hydraulic closer complying with ANSI/BHMA A156.19.
2. Hydraulic Fluid: Fireproof, passing requirements of UL10C, and requiring no seasonal closer adjustment for temperatures ranging from 120 degrees F to -30 degrees F.
3. Provide units with conventional door closer opening and closing forces unless power operator motor is activated. Provide door closer assembly with adjustable spring size, back-check, and opening and closing speed adjustment valves to control door
4. Provide units with on/off switch for manual operation, motor start up delay, vestibule interface delay, electric lock delay, and door hold open delay.
5. Provide drop plates, brackets, and adapters for arms as required for details.
6. Provide actuator switches and receivers for operation as specified.
7. Provide weather-resistant actuators at exterior applications.
8. Provide key switches with LED's, recommended and approved by manufacturer of automatic operator as required for function described in operation description of hardware group below. Cylinders: Refer to "KEYING" article, herein.
9. Provide complete assemblies of controls, switches, power supplies, relays, and parts/material recommended and approved by manufacturer of automatic operator for each individual leaf. Actuators control both doors simultaneously at pairs. Sequence operation of exterior and vestibule doors with automatic operators to allow ingress or egress through both sets of openings as directed by Architect. Locate actuators, key switches, and other controls as directed by Architect.
10. Provide units with vestibule inputs that allow sequencing operation of two units, and SPDT relay for interfacing with latching or locking devices.

2.11 DOOR TRIM

A. Manufacturers:

1. Scheduled Manufacturer:
 - a. Ives
2. Acceptable Manufacturers:
 - a. Trimco
 - b. Rockwood

B. Requirements:

1. Provide push plates, push bars, pull plates, pulls, and hands-free reversible door pulls with diameter and length as scheduled.

2.12 PROTECTION PLATES

A. Manufacturers:

1. Scheduled Manufacturer:
 - a. Trimco
2. Acceptable Manufacturers:
 - a. Ives
 - b. Rockwood

B. Requirements:

1. Provide protection plates with a minimum of 0.050 inch (1 mm) thick, beveled four edges as scheduled. Furnish with sheet metal or wood screws, finished to match plates.
2. Sizes plates 2 inches (51 mm) less width of door on single doors, pairs of doors with a mullion, and doors with edge guards. Size plates 1 inch (25 mm) less width of door on pairs without a mullion or edge guards.
3. At fire rated doors, provide protection plates over 16 inches high with UL label.

2.13 OVERHEAD STOPS AND OVERHEAD STOP/HOLDERS

A. Manufacturers:

1. Scheduled Manufacturers:
 - a. Glynn-Johnson
2. Acceptable Manufacturers:
 - a. Rixson
 - b. ABH

B. Requirements:

1. Provide overhead stop at any door where conditions do not allow for a wall stop or floor stop presents tripping hazard.

2.14 DOOR STOPS AND HOLDERS

A. Manufacturers:

1. Scheduled Manufacturer:
 - a. Trimco
2. Acceptable Manufacturers:
 - a. Ives
 - b. Rockwood

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 a wall stop cannot be used, provide universal floor stops.
3. Where wall or floor stop cannot be used, provide overhead stop.
4. Provide roller bumper where doors open into each other and overhead stop cannot be used.

2.15 SILENCERS

A. Manufacturers:

1. Scheduled Manufacturer:
 - a. Ives
2. Acceptable Manufacturers:
 - a. Rockwood
 - b. Trimco

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.

2.16 THRESHOLDS, SEALS, DOOR SWEEPS, AUTOMATIC DOOR BOTTOMS, AND GASKETING

A. Manufacturers:

B. Scheduled Manufacturer:

1. Zero International

C. Acceptable Manufacturers:

1. National Guard
2. Pemko

D. Seals and Gasketing: Provide continuous gasketing on exterior openings, to the head and jams, forming a continuous seal between the door and the frame. Provide smoke, light, or sound gasketing on interior doors where indicated.

1. Provide self-tapping fasteners for aluminum extruded gasketing being applied to hollow metal frames.
 - a. Provide non-corrosive fasteners for all exterior applications.
 - b. Provide security fasteners where indicated.
2. Provide neoprene, EPDM, silicone, or nylon brush inserts as specified in hardware sets. Provide non brush inserts of solid or sponge cell, as specified in hardware sets. Vinyl inserts are not allowed except where specified in hardware sets.

E. Smoke Labeled Gasketing: At all smoke labeled openings, provide smoke listed perimeter gasketing assemblies complying with NFPA 105 listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction for smoke control ratings indicated based on testing according to UL 1784.

F. Fire Listed Gasketing: Assemblies complying with NFPA 80 that are listed by a testing and inspecting agency acceptable to authorities having jurisdiction for fire ratings indicated based on testing according to UL-10C.

1. Where frame-applied intumescent seals are required by the manufacturer, provide gaskets that comply with UL10C Standard for Positive Pressure Fire Tests of Door Assemblies and UBC 7-2, Fire Tests of Door Assemblies.
- G. Sound-Rated Gasketing: Provide acoustic gasketing to meet Sound Transmission Class (STC) rating required.
- H. Meeting-Stile Gasketing: Provide meeting-stile gasketing that fastens to the meeting stiles forming a continuous seal when doors are closed.
- I. Door Sweeps or Shoes: Apply to the bottom of the door to close the gap between the door bottom and finished floor or saddle threshold.
 1. Provide solid neoprene, EPDM, silicone, or nylon brush type of seal as specified in hardware sets. Vinyl inserts are not allowed except where specified in hardware sets.
- J. Rain Drips:
 1. Provide overhead rain drips for out-swinging hollow metal doors that are not covered against 45 degree blowing rain. Aluminum extrusion to be a minimum of .088 inches thick and extend 2.50 inches from the face of the frame, in anodized finish to match door.
 2. Door sweeps or shoes with integral rain drip must meet ADA requirements
- K. Thresholds: Provide threshold units not less than 4 inches wide, formed to accommodate change in floor elevation where indicated, and fabricated to accommodate door hardware and fit door frames.
 1. Threshold extrusion to be a minimum thickness as specified in hardware sets.

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. 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.
- L. 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.
- M. Overhead Stops/Holders: Mount overhead stops/holders on room side of corridor doors, inside of exterior doors, and stair side of stairway doors.
- N. 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.
- O. Thresholds:

1. Set thresholds in full bed of sealant complying with requirements specified in Division 07 Section "Joint Sealants."
 2. Aluminum thresholds to be cut-in, and scribed around mullions, frame members, and stops. Do not butt to thresholds. Provide a continuous surface across full width of opening from jamb to jamb.
 3. Where aluminum panic-type (rabbeted) thresholds with neoprene inserts are specified, undercut doors as required to properly mate with seal in threshold.
- P. 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.
- Q. Perimeter Gasketing:
1. Apply to head and jamb, forming seal between door and frame.
 2. Install gasketing in a manner eliminating need to cut any seal to install surface mounted hardware. Install compatible mounting bracket for surface mounted hardware unless minimum 1/4 inch thick solid aluminum seals are provided for mounting of surface applied hardware.
- R. Meeting Stile Gasketing: Fasten to meeting stiles, forming seal when doors are closed.
- S. 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. Electric Strikes: Adjust horizontal and vertical alignment of keeper to properly engage lock bolt.
 2. 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:

Abbreviation	Name
ABH	Abh Manufacturing
GLY	Glynn-Johnson Corp
IVE	H.B. Ives
KEE	Keedex Inc
LCN	LCN Commercial Division
SCH	Schlage Lock Company
TRI	Trimco/Bbw/Quality
VON	Von Duprin
ZER	Zero International Inc

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Hardware Group No. 01

For use on Door #(s):
G107-2

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	SET	EXTERIOR HINGE	5BB1 (SIZE, QTY, WEIGHT, NRP AS REQ'D)	630	IVE
1	EA	PANIC HARDWARE	LD-99-NL	626	VON
1	EA	RIM CYLINDER	20-057 ICX	626	SCH
1	EA	FSIC CORE	23-030	626	SCH
1	EA	SURFACE CLOSER	4040XP EDA X ST-1944	689	LCN
1	EA	WIND BOLLARD	REF DETAIL 1A/A9.1 & 2A/A9.1		
1	EA	KICK PLATE	K0050 10"	630	TRI
1	SET	GASKETING	429AA @ HEAD & JAMBS	AA	ZER
1	EA	DOOR SWEEP	39A	A	ZER
1	EA	SADDLE THRESHOLD	1/2" HIGH X DEPTH AS REQ'D BY SILL DETAIL	AL	ZER
1	EA	DOOR POSITION SWITCH*	BY DIV 28 (COORDINATE REQ'D PREP WITH SECURITY CONTRACTOR)		

FREE EGRESS AT ALL TIMES.

KEY ENTRY.

DOOR CONTACT MONITORS WHEN DOOR OPENS AND CLOSES. MECHANICAL KEY OVERRIDE.

Hardware Group No. 02

For use on Door #(s):

F107-6 G103-3

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
2	SET	EXTERIOR HINGE	5BB1 (SIZE, QTY, WEIGHT, NRP AS REQ'D)	630	IVE
1	EA	REMOVABLE MULLION	KR4954 STAB	689	VON
2	EA	PANIC HARDWARE	LD-99-EO	626	VON
1	EA	MORTISE CYLINDER	20-061 ICX	626	SCH
1	EA	FSIC CORE	23-030	626	SCH
2	EA	SURFACE CLOSER (W/ SPRING STOP)	4040XP SCUSH X ST-1595	689	LCN
2	EA	KICK PLATE	K0050 10"	630	TRI
1	SET	GASKETING	429AA @ HEAD & JAMBS	AA	ZER
1	EA	MULLION SEAL	8780N	BK	ZER
2	EA	DOOR SWEEP	39A	A	ZER
1	EA	SADDLE THRESHOLD	1/2" HIGH X DEPTH AS REQ'D BY SILL DETAIL	AL	ZER
2	EA	DOOR POSITION SWITCH*	BY DIV 28 (COORDINATE REQ'D PREP WITH SECURITY CONTRACTOR)		

FREE EGRESS AT ALL TIMES.

NO ENTRY.

DOOR CONTACT MONITORS WHEN DOOR OPENS AND CLOSES.

Hardware Group No. 03

For use on Door #(s):
G106-2

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
2	SET	EXTERIOR HINGE	5BB1 (SIZE, QTY, WEIGHT, NRP AS REQ'D)	630	IVE
1	EA	REMOVABLE MULLION	KR4954 STAB	689	VON
1	EA	PANIC HARDWARE	LD-99-NL	626	VON
1	EA	PANIC HARDWARE	LD-99-EO	626	VON
1	EA	MORTISE CYLINDER	20-061 ICX	626	SCH
1	EA	RIM CYLINDER	20-057 ICX	626	SCH
2	EA	FSIC CORE	23-030	626	SCH
2	EA	SURFACE CLOSER	4040XP EDA X ST-1944	689	LCN
2	EA	WIND BOLLARD	REF DETAIL 1A/A9.1 & 2A/A9.1		
2	EA	KICK PLATE	K0050 10"	630	TRI
1	SET	GASKETING	429AA @ HEAD & JAMBS	AA	ZER
1	EA	MULLION SEAL	8780N	BK	ZER
2	EA	DOOR SWEEP	39A	A	ZER
1	EA	SADDLE THRESHOLD	1/2" HIGH X DEPTH AS REQ'D BY SILL DETAIL	AL	ZER
2	EA	DOOR POSITION SWITCH*	BY DIV 28 (COORDINATE REQ'D PREP WITH SECURITY CONTRACTOR)		

FREE EGRESS AT ALL TIMES.

NO ENTRY.

DOOR CONTACT MONITORS WHEN DOOR OPENS AND CLOSES.

Hardware Group No. 04

For use on Door #(s):
D110-1

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	SET	EXTERIOR HINGE	5BB1 (SIZE, QTY, WEIGHT, NRP AS REQ'D)	630	IVE
1	EA	POWER TRANSFER	EPT10	✓ 689	VON
1	EA	ELEC PANIC HARDWARE (W/ RX SWITCH)	RX-QEL-99-NL 24 VDC	✓ 626	VON
1	EA	RIM CYLINDER	20-057 ICX	626	SCH
1	EA	FSIC CORE	23-030	626	SCH
1	EA	SURFACE CLOSER	4040XP EDA X ST-1944	689	LCN
1	EA	WIND BOLLARD	REF DETAIL 1A/A9.1 & 2A/A9.1		
1	EA	ARMOR PLATE	KA050 34"	630	TRI
1	SET	GASKETING	429AA @ HEAD & JAMBS	AA	ZER
1	EA	DOOR SWEEP	39A	A	ZER
1	EA	SADDLE THRESHOLD	1/2" HIGH X DEPTH AS REQ'D BY SILL DETAIL	AL	ZER
1	EA	LOW VOLTAGE POWER*	BY DIV 28	✓	
1	EA	CARD READER*	BY DIV 28	✓	
1	EA	DOOR POSITION SWITCH*	BY DIV 28 (COORDINATE REQ'D PREP WITH SECURITY CONTRACTOR)	✓	

FREE EGRESS AT ALL TIMES.

AUTHORIZED CREDENTIAL MOMENTARILY RETRACTS LATCHBOLT, ALLOWING ENTRY.
RX SWITCH (INTEGRAL TO LOCKING HARDWARE) WILL SHUNT THE DOOR CONTACT AND
ALLOW FOR AUTHORIZED EGRESS.

DOOR CONTACT MONITORS WHEN DOOR OPENS AND CLOSES. MECHANICAL KEY OVERRIDE.
ON LOSS OF POWER, ELECTRIFIED HARDWARE IS DISABLED. DOOR IS LATCHED. TRIM
REMAINS SECURE.

Hardware Group No. 05

For use on Door #(s):

F107-5 G103-2

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
2	SET	EXTERIOR HINGE	5BB1 (SIZE, QTY, WEIGHT, NRP AS REQ'D)	630	IVE
2	EA	POWER TRANSFER	EPT10	✓ 689	VON
1	EA	REMOVABLE MULLION	KR4954 STAB	689	VON
1	EA	PANIC HARDWARE (W/ RX SWITCH)	LD-RX-99-EO	✓ 626	VON
1	EA	ELEC PANIC HARDWARE (W/ RX SWITCH)	RX-QEL-99-NL 24 VDC	✓ 626	VON
1	EA	MORTISE CYLINDER	20-061 ICX	626	SCH
1	EA	RIM CYLINDER	20-057 ICX	626	SCH
2	EA	FSIC CORE	23-030	626	SCH
2	EA	SURFACE CLOSER (W/ SPRING STOP)	4040XP SCUSH X ST-1595	689	LCN
2	EA	KICK PLATE	K0050 10"	630	TRI
1	SET	GASKETING	429AA @ HEAD & JAMBS	AA	ZER
1	EA	MULLION SEAL	8780N	BK	ZER
2	EA	DOOR SWEEP	39A	A	ZER
1	EA	SADDLE THRESHOLD	1/2" HIGH X DEPTH AS REQ'D BY SILL DETAIL	AL	ZER
1	EA	LOW VOLTAGE POWER*	BY DIV 28	✓	
1	EA	CARD READER*	BY DIV 28	✓	
2	EA	DOOR POSITION SWITCH*	BY DIV 28 (COORDINATE REQ'D PREP WITH SECURITY CONTRACTOR)	✓	

FREE EGRESS AT ALL TIMES.

AUTHORIZED CREDENTIAL MOMENTARILY RETRACTS LATCHBOLT, ALLOWING ENTRY.

DURING OPEN HOURS, ACCESS CONTROL SYSTEM TIME CLOCK ELECTRICALLY KEEPS LATCH RETRACTED, ALLOWING ENTRY.

RX SWITCH (INTEGRAL TO LOCKING HARDWARE) MONITORS AUTHORIZED EGRESS.

DOOR CONTACT MONITORS WHEN DOOR OPENS AND CLOSES.

ON LOSS OF POWER, ELECTRIFIED HARDWARE IS DISABLED. DOOR IS POSITIVELY LATCHED AND TRIM REMAINS SECURE.

OPENING REQUIRES INTEGRATION WITH ACCESS CONTROL SYSTEM.

Hardware Group No. 05.01

For use on Door #(s):
F107-7

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
2	SET	EXTERIOR HINGE	5BB1 (SIZE, QTY, WEIGHT, NRP AS REQ'D)	630	IVE
2	EA	POWER TRANSFER	EPT10	✓ 689	VON
1	EA	FIRE RATED REMOVABLE MULLION	KR9954 STAB	689	VON
1	EA	PANIC HARDWARE (W/ RX SWITCH)	RX-99-EO-F-SNB	✓ 626	VON
1	EA	ELEC PANIC HARDWARE (W/ RX SWITCH)	RX-QEL-99-NL-F-SNB 24 VDC	✓ 626	VON
1	EA	MORTISE CYLINDER	20-061 ICX	626	SCH
1	EA	RIM CYLINDER	20-057 ICX	626	SCH
2	EA	FSIC CORE	23-030	626	SCH
2	EA	SURFACE CLOSER	4040XP EDA X ST-1944	689	LCN
2	EA	WIND BOLLARD	REF DETAIL 1A/A9.1 & 2A/A9.1		
2	EA	KICK PLATE	K0050 10"	630	TRI
1	SET	GASKETING	429AA @ HEAD & JAMBS	AA	ZER
1	EA	MULLION SEAL	8780N	BK	ZER
2	EA	DOOR SWEEP	39A	A	ZER
1	EA	SADDLE THRESHOLD	1/2" HIGH X DEPTH AS REQ'D BY SILL DETAIL	AL	ZER
1	EA	LOW VOLTAGE POWER*	BY DIV 28	✓	
1	EA	CARD READER*	BY DIV 28	✓	
2	EA	DOOR POSITION SWITCH*	BY DIV 28 (COORDINATE REQ'D PREP WITH SECURITY CONTRACTOR)	✓	

FREE EGRESS AT ALL TIMES.

AUTHORIZED CREDENTIAL MOMENTARILY RETRACTS LATCHBOLT, ALLOWING ENTRY.
DURING OPEN HOURS, ACCESS CONTROL SYSTEM TIME CLOCK ELECTRICALLY KEEPS LATCH RETRACTED, ALLOWING ENTRY.

RX SWITCH (INTEGRAL TO LOCKING HARDWARE) MONITORS AUTHORIZED EGRESS.

DOOR CONTACT MONITORS WHEN DOOR OPENS AND CLOSES.

ON LOSS OF POWER, ELECTRIFIED HARDWARE IS DISABLED. DOOR IS POSITIVELY LATCHED AND TRIM REMAINS SECURE.

OPENING REQUIRES INTEGRATION WITH ACCESS CONTROL SYSTEM.

Hardware Group No. 06

For use on Door #(s):

E145-1 E148-1 E151-1

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
2	SET	INTERIOR HINGE	5BB1 SERIES (QTY, WEIGHT, SIZE, NRP AS REQ'D)	652	IVE
1	EA	FIRE RATED REMOVABLE MULLION	KR9954 STAB	689	VON
1	EA	FIRE EXIT HARDWARE	99-EO-F	626	VON
1	EA	FIRE EXIT HARDWARE	99-L-F-2SI-06	626	VON
1	EA	MORTISE CYLINDER	20-061 ICX	626	SCH
2	EA	RIM CYLINDER	20-057 ICX	626	SCH
3	EA	FSIC CORE	23-030	626	SCH
2	EA	SURFACE CLOSER	4040XP EDA	689	LCN
2	EA	KICK PLATE	K0050 10"	630	TRI
2	EA	WALL MAG HOLD OPEN	SEM7800 SERIES	✓ 689	LCN
1	EA	GASKETING	488SBK PSA	BK	ZER
1	EA	MULLION SEAL	8780N	BK	ZER

Hardware Group No. 07 - Not Used

Hardware Group No. 08

For use on Door #(s):

D103

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
2	SET	INTERIOR HINGE	5BB1 SERIES (QTY, WEIGHT, SIZE, NRP AS REQ'D)	652	IVE
1	EA	FIRE RATED REMOVABLE MULLION	KR9954 STAB	689	VON
1	EA	FIRE EXIT HARDWARE	99-EO-F	626	VON
1	EA	FIRE EXIT HARDWARE	99-L-BE-F-06	626	VON
1	EA	MORTISE CYLINDER	20-061 ICX	626	SCH
1	EA	FSIC CORE	23-030	626	SCH
2	EA	SURFACE CLOSER	4040XP EDA	689	LCN
2	EA	KICK PLATE	K0050 10"	630	TRI
2	EA	WALL MAG HOLD OPEN	SEM7800 SERIES	✓ 689	LCN
1	EA	GASKETING	488SBK PSA	BK	ZER
1	EA	MULLION SEAL	8780N	BK	ZER

Hardware Group No. 09

For use on Door #(s):

A110-1	A110-2	A112-1	A112-2	A201-1	A210-1
A210-2	A212-1	A212-2	B201-2	B208-1	B208-2
D132	E118-1	E122-2	E134-2	E139-1	D123

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	SET	INTERIOR HINGE	5BB1 SERIES (QTY, WEIGHT, SIZE, NRP AS REQ'D)	652	IVE
1	EA	PANIC HARDWARE	LD-99-L-2SI-06	626	VON
2	EA	RIM CYLINDER	20-057 ICX	626	SCH
2	EA	FSIC CORE	23-030	626	SCH
1	EA	SURFACE CLOSER	4040XP EDA	689	LCN
1	EA	KICK PLATE	K0050 10"	630	TRI
1	EA	WALL MAG HOLD OPEN	SEM7800 SERIES	✎ 689	LCN
1	EA	GASKETING	488SBK PSA	BK	ZER

Hardware Group No. 10 - Not Used

Hardware Group No. 10.01

For use on Door #(s):

D126	D131	D138
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Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	SET	INTERIOR HINGE	5BB1 SERIES (QTY, WEIGHT, SIZE, NRP AS REQ'D)	652	IVE
1	EA	PANIC HARDWARE	LD-99-L-2SI-06	626	VON
2	EA	RIM CYLINDER	20-057 ICX	626	SCH
2	EA	FSIC CORE	23-030	626	SCH
1	EA	SURFACE CLOSER	4040XP EDA	689	LCN
1	EA	KICK PLATE	K0050 10"	630	TRI
1	EA	WALL STOP	1270CVSV	626	TRI
1	EA	GASKETING	488SBK PSA	BK	ZER

Hardware Group No. 11

For use on Door #(s):
E110-2

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	SET	INTERIOR HINGE	5BB1 SERIES (QTY, WEIGHT, SIZE, NRP AS REQ'D)	652	IVE
1	EA	PANIC HARDWARE	LD-99-L-2SI-06	626	VON
2	EA	RIM CYLINDER	20-057 ICX	626	SCH
2	EA	FSIC CORE	23-030	626	SCH
1	EA	SURFACE CLOSER (W/ SPRING STOP)	4040XP SCUSH	689	LCN
1	EA	KICK PLATE	K0050 10"	630	TRI
1	EA	GASKETING	488SBK PSA	BK	ZER

Hardware Group No. 12

For use on Door #(s):
D105 F107-4 G103-1

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
2	SET	INTERIOR HINGE	5BB1 SERIES (QTY, WEIGHT, SIZE, NRP AS REQ'D)	652	IVE
1	EA	REMOVABLE MULLION	KR4954 STAB	689	VON
1	EA	PANIC HARDWARE	LD-99-EO	626	VON
1	EA	PANIC HARDWARE	LD-99-L-2SI-06	626	VON
1	EA	MORTISE CYLINDER	20-061 ICX	626	SCH
2	EA	RIM CYLINDER	20-057 ICX	626	SCH
3	EA	FSIC CORE	23-030	626	SCH
2	EA	SURFACE CLOSER (W/ SPRING STOP)	4040XP SCUSH	689	LCN
2	EA	KICK PLATE	K0050 10"	630	TRI
1	EA	GASKETING	488SBK PSA	BK	ZER
1	EA	MULLION SEAL	8780N	BK	ZER

Hardware Group No. 13

For use on Door #(s):

E150-1 E150-2

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	SET	INTERIOR HINGE	5BB1 SERIES (QTY, WEIGHT, SIZE, NRP AS REQ'D)	652	IVE
1	EA	FIRE EXIT HARDWARE	99-EO-F	626	VON
1	EA	SURFACE CLOSER (W/ SPRING STOP)	4040XP SCUSH	689	LCN
1	EA	KICK PLATE	K0050 10"	630	TRI
1	EA	GASKETING	488SBK PSA	BK	ZER

Hardware Group No. 14

For use on Door #(s):

G107-1

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	SET	INTERIOR HINGE	5BB1 SERIES (QTY, WEIGHT, SIZE, NRP AS REQ'D)	652	IVE
1	EA	FIRE EXIT HARDWARE	99-L-NL-F-06	626	VON
1	EA	RIM CYLINDER	20-057 ICX	626	SCH
1	EA	FSIC CORE	23-030	626	SCH
1	EA	SURFACE CLOSER (W/ SPRING STOP)	4040XP SCUSH	689	LCN
1	EA	KICK PLATE	K0050 10"	630	TRI
1	EA	GASKETING	488SBK PSA	BK	ZER

Hardware Group No. 15

For use on Door #(s):

E110-1 E118-2 E122-1 G102-1 G102-2 G105-1
G105-2

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
2	SET	INTERIOR HINGE	5BB1 SERIES (QTY, WEIGHT, SIZE, NRP AS REQ'D)	652	IVE
1	EA	REMOVABLE MULLION	KR4954 STAB	689	VON
1	EA	PANIC HARDWARE	LD-99-EO	626	VON
1	EA	PANIC HARDWARE	LD-99-L-2SI-06	626	VON
1	EA	MORTISE CYLINDER	20-061 ICX	626	SCH
2	EA	RIM CYLINDER	20-057 ICX	626	SCH
3	EA	FSIC CORE	23-030	626	SCH
2	EA	SURFACE CLOSER	4040XP EDA	689	LCN
2	EA	KICK PLATE	K0050 10"	630	TRI
2	EA	WALL MAG HOLD OPEN	SEM7800 SERIES	✎ 689	LCN
1	EA	GASKETING	488SBK PSA	BK	ZER
1	EA	MULLION SEAL	8780N	BK	ZER

Hardware Group No. 16

For use on Door #(s):

C102-2 C127-2

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	SET	INTERIOR HINGE	5BB1 SERIES (QTY, WEIGHT, SIZE, NRP AS REQ'D)	652	IVE
1	EA	ELECTRIC HINGE	5BB1 SERIES TW8 (WEIGHT, SIZE, AS REQ'D)	✎ 652	IVE
1	EA	ELEC PANIC HARDWARE	QEL-99-L-NL-06 24 VDC	✎ 626	VON
1	EA	RIM CYLINDER	20-057 ICX	626	SCH
1	EA	FSIC CORE	23-030	626	SCH
1	EA	SURFACE CLOSER	4040XP EDA	689	LCN
1	EA	KICK PLATE	K0050 10"	630	TRI
1	EA	WALL STOP	1270CVSV	626	TRI
1	EA	GASKETING	488SBK PSA	BK	ZER
1	EA	LOW VOLTAGE POWER*	BY DIV 28	✎	
1	EA	CARD READER*	BY DIV 28	✎	

FREE EGRESS AT ALL TIMES.

AUTHORIZED CREDENTIAL MOMENTARILY RETRACTS LATCHBOLT, ALLOWING ENTRY.
ON LOSS OF POWER, ELECTRIFIED HARDWARE IS DISABLED. DOOR IS LATCHED. TRIM
REMAINS SECURE.

Hardware Group No. 17 - Not Used

Hardware Group No. 18

For use on Door #(s):
D101-1

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
2	SET	INTERIOR HINGE	5BB1 SERIES (QTY, WEIGHT, SIZE, NRP AS REQ'D)	652	IVE
2	EA	FIRE EXIT HARDWARE	9927-EO-F-LBR	626	VON
2	EA	SURFACE CLOSER	4040XP EDA	689	LCN
2	EA	KICK PLATE	K0050 10"	630	TRI
2	EA	WALL MAG HOLD OPEN	SEM7800 SERIES	✓ 689	LCN
1	EA	GASKETING	488SBK PSA	BK	ZER
1	EA	LOCKDOWN SYSTEM*	BY DIV 28	✓	

DOORS ARE NORMALLY HELD OPEN ON MAGNETIC HOLD OPENS.
UPON LOSS OF POWER, SIGNAL FROM LOCKDOWN SYSTEM OR SIGNAL FROM FIRE ALARM;
MAGNETIC HOLD OPENS RELEASE DOORS, ALLOWING DOORS TO CLOSE AND LATCH.
DOORS ARE LOCKED WHEN CLOSED.

Hardware Group No. 18.01

For use on Door #(s):
B212-2

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
2	SET	INTERIOR HINGE	5BB1 SERIES (QTY, WEIGHT, SIZE, NRP AS REQ'D)	652	IVE
1	EA	ELECTRIC HINGE	5BB1 SERIES TW8 (WEIGHT, SIZE, AS REQ'D)	✓ 652	IVE
1	EA	PANIC HARDWARE	LD-9927-EO-LBR	626	VON
1	EA	ELEC PANIC HARDWARE	QEL-9927-L-NL-LBR-06 24 VDC	✓ 626	VON
1	EA	RIM CYLINDER	20-057 ICX	626	SCH
1	EA	FSIC CORE	23-030	626	SCH
2	EA	SURFACE CLOSER	4040XP EDA	689	LCN
2	EA	KICK PLATE	K0050 10"	630	TRI
2	EA	WALL MAG HOLD OPEN	SEM7800 SERIES	✓ 689	LCN
1	EA	GASKETING	488SBK PSA	BK	ZER
1	EA	LOCKDOWN SYSTEM*	BY DIV 28	✓	
1	EA	LOW VOLTAGE POWER*	BY DIV 28	✓	
1	EA	CARD READER*	BY DIV 28	✓	

HARDWARE FINISH: MATCH FINISH OF DOOR AND FRAME.

DOORS ARE NORMALLY HELD OPEN ON MAGNETIC HOLD OPENS.
UPON LOSS OF POWER, SIGNAL FROM LOCKDOWN SYSTEM OR SIGNAL FROM FIRE ALARM;
MAGNETIC HOLD OPENS RELEASE DOORS, ALLOWING DOORS TO CLOSE AND LATCH.
DOORS ARE LOCKED WHEN CLOSED. VALID CREDENTIAL WILL MOMENTARILY RETRACT
LATCHBOLT. MECHANICAL KEY OVERRIDE.

Hardware Group No. 18.02

For use on Door #(s):

B101-5 B212-1

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
2	SET	INTERIOR HINGE	5BB1 SERIES (QTY, WEIGHT, SIZE, NRP AS REQ'D)	652	IVE
2	EA	PANIC HARDWARE	LD-9927-EO-LBR	626	VON
2	EA	SURFACE CLOSER	4040XP EDA	689	LCN
2	EA	KICK PLATE	K0050 10"	630	TRI
2	EA	WALL MAG HOLD OPEN	SEM7800 SERIES	✓ 689	LCN
1	EA	GASKETING	488SBK PSA	BK	ZER
1	EA	LOCKDOWN SYSTEM*	BY DIV 28	✓	

HARDWARE FINISH: MATCH FINISH OF DOOR AND FRAME.

DOORS ARE NORMALLY HELD OPEN ON MAGNETIC HOLD OPENS.

UPON LOSS OF POWER, SIGNAL FROM LOCKDOWN SYSTEM OR SIGNAL FROM FIRE ALARM; MAGNETIC HOLD OPENS RELEASE DOORS, ALLOWING DOORS TO CLOSE AND LATCH.

DOORS ARE LOCKED WHEN CLOSED.

Hardware Group No. 19

For use on Door #(s):

B102 B103 B202 B202 B203 D101-2

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
2	SET	INTERIOR HINGE	5BB1 SERIES (QTY, WEIGHT, SIZE, NRP AS REQ'D)	652	IVE
1	EA	ELECTRIC HINGE	5BB1 SERIES TW8 (WEIGHT, SIZE, AS REQ'D)	✓ 652	IVE
1	EA	FIRE EXIT HARDWARE	9927-EO-F-LBR	626	VON
1	EA	ELEC FIRE EXIT HARDWARE	QEL-9927-L-NL-F-LBR-06-499F 24 VDC	✓ 626	VON
1	EA	RIM CYLINDER	20-057 ICX	626	SCH
1	EA	FSIC CORE	23-030	626	SCH
2	EA	SURFACE CLOSER	4040XP EDA	689	LCN
2	EA	KICK PLATE	K0050 10"	630	TRI
2	EA	WALL MAG HOLD OPEN	SEM7800 SERIES	✓ 689	LCN
1	EA	GASKETING	488SBK PSA	BK	ZER
1	EA	LOCKDOWN SYSTEM*	BY DIV 28	✓	
1	EA	LOW VOLTAGE POWER*	BY DIV 28	✓	
1	EA	CARD READER*	BY DIV 28	✓	

DOORS ARE NORMALLY HELD OPEN ON MAGNETIC HOLD OPENS.

UPON LOSS OF POWER, SIGNAL FROM LOCKDOWN SYSTEM OR SIGNAL FROM FIRE ALARM; MAGNETIC HOLD OPENS RELEASE DOORS, ALLOWING DOORS TO CLOSE AND LATCH.

DOORS ARE LOCKED WHEN CLOSED. VALID CREDENTIAL WILL MOMENTARILY RETRACT LATCHBOLT. MECHANICAL KEY OVERRIDE.

Hardware Group No. 20

For use on Door #(s):

E128 E130A

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	SET	INTERIOR HINGE	5BB1 SERIES (QTY, WEIGHT, SIZE, NRP AS REQ'D)	652	IVE
1	EA	CLASSROOM LOCK	L9070T 06A	626	SCH
1	EA	FSIC CORE	23-030	626	SCH
1	EA	SURFACE CLOSER	4040XP EDA	689	LCN
1	EA	KICK PLATE	K0050 10"	630	TRI
1	EA	WALL STOP	1270CVSV	626	TRI
1	EA	GASKETING	488SBK PSA	BK	ZER

Hardware Group No. 20.01

For use on Door #(s):

D119-2

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	SET	INTERIOR HINGE	5BB1 SERIES (QTY, WEIGHT, SIZE, NRP AS REQ'D)	652	IVE
1	EA	CLASSROOM LOCK	L9070T 06A	626	SCH
1	EA	FSIC CORE	23-030	626	SCH
1	EA	SURFACE CLOSER (W/ SPRING STOP & DELAY CLOSE)	4041 DEL SCUSH TBWMS	689	LCN
1	EA	KICK PLATE	K0050 10"	630	TRI
1	EA	GASKETING	488SBK PSA	BK	ZER

Hardware Group No. 20.02

For use on Door #(s):

D119-1

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	SET	INTERIOR HINGE	5BB1 SERIES (QTY, WEIGHT, SIZE, NRP AS REQ'D)	652	IVE
1	EA	CLASSROOM LOCK	L9070T 06A	626	SCH
1	EA	FSIC CORE	23-030	626	SCH
1	EA	SURFACE CLOSER (W/ DELAYED ACTION CLOSING)	4041 DEL EDA TBWMS	689	LCN
1	EA	KICK PLATE	K0050 10"	630	TRI
1	EA	WALL STOP	1270CVSV	626	TRI
1	EA	GASKETING	488SBK PSA	BK	ZER

Hardware Group No. 21

For use on Door #(s):

A111-1 A111-2 A211-1 A211-2 D120 E136

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	SET	INTERIOR HINGE	5BB1 SERIES (QTY, WEIGHT, SIZE, NRP AS REQ'D)	652	IVE
1	EA	CLASSROOM LOCK	L9070T 06A	626	SCH
1	EA	FSIC CORE	23-030	626	SCH
1	EA	OH STOP	90S	630	GLY
1	EA	KICK PLATE	K0050 10"	630	TRI
1	EA	GASKETING	488SBK PSA	BK	ZER

Hardware Group No. 21.03 - Not Used

Hardware Group No. 22

For use on Door #(s):

E121

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
2	SET	INTERIOR HINGE	5BB1 SERIES (QTY, WEIGHT, SIZE, NRP AS REQ'D)	652	IVE
1	EA	CONST LATCHING BOLT	FB51P/61P AS REQ'D BY DOOR MATERIAL	630	IVE
1	EA	DUST PROOF STRIKE	DP1/ DP2 AS REQ'D	626	IVE
1	EA	CLASSROOM LOCK	L9070T 06A	626	SCH
1	EA	FSIC CORE	23-030	626	SCH
1	EA	COORDINATOR	COR X FL X MB AS REQUIRED	628	IVE
2	EA	SURFACE CLOSER	4040XP EDA X ST-1754	689	LCN
2	EA	KICK PLATE	K0050 10"	630	TRI
2	EA	WALL STOP	1270CVSV	626	TRI
1	EA	GASKETING	488SBK PSA	BK	ZER
1	EA	OVERLAPPING ASTRAGAL	383AA	AA	ZER

Hardware Group No. 23

For use on Door #(s):

E152-2 E155

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
2	SET	INTERIOR HINGE	5BB1 SERIES (QTY, WEIGHT, SIZE, NRP AS REQ'D)	652	IVE
1	EA	CONST LATCHING BOLT	FB51P/61P AS REQ'D BY DOOR MATERIAL	630	IVE
1	EA	DUST PROOF STRIKE	DP1/ DP2 AS REQ'D	626	IVE
1	EA	CLASSROOM LOCK	L9070T 06A	626	SCH
1	EA	FSIC CORE	23-030	626	SCH
1	EA	COORDINATOR	COR X FL X MB AS REQUIRED	628	IVE
2	EA	SURFACE CLOSER (W/ HOLD OPEN)	4040XP HEDA X ST-1754	689	LCN
2	EA	KICK PLATE	K0050 10"	630	TRI
2	EA	WALL STOP	1270CVSV	626	TRI
1	EA	GASKETING	488SBK PSA	BK	ZER
1	EA	OVERLAPPING ASTRAGAL	383AA	AA	ZER

Hardware Group No. 24

For use on Door #(s):

B110-1 C110 C122 C133 B215 C205
D116 E138 E141 G111-1

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	SET	INTERIOR HINGE	5BB1 SERIES (QTY, WEIGHT, SIZE, NRP AS REQ'D)	652	IVE
1	EA	CLASSROOM LOCK	L9070T 06A	626	SCH
1	EA	FSIC CORE	23-030	626	SCH
1	EA	KICK PLATE	K0050 10"	630	TRI
1	EA	WALL STOP	1270CVSV	626	TRI
1	EA	GASKETING	488SBK PSA	BK	ZER

Hardware Group No. 25

For use on Door #(s):

A103	A104	A105	A106	A107	A108
A109	A113	A114	A115	A117-1	A117-2
A125-1	A125-2	A203	A204	A205	A206
A207	A208	A209	A213	A214	A215
A217-1	A217-2	A224-1	A224-2	B104	B106-1
B106-2	B108	B109	B110-2	B111	B112
B113	B114	B115	B116	B118	B119
B120	B121	B122	B123	B124	B125
B126-1	B126-2	B134-1	B134-2	B136-1	B136-2
B141	B142	B143	B144-1	B145	B146
B147	B148	B204	B205	B206	B207
B209	B210-1	B213	B214-1	B214	B217
B218	B219	B220	B221	B222	B223
B225-1	B225-2	B232-1	B232-2	C107	C108
C109	C111	C114	C115	C117	C118
C119	C120	C121	C125-1	C125-2	C126
C132	C204	C205A	C206	E131-3	D111
D113	D114	D115	D118-1	D118-2	D106
E113	E114	E119	E129	E133	E129
G108	G109	G110-1	G110-2	G111-2	

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	SET	INTERIOR HINGE	5BB1 SERIES (QTY, WEIGHT, SIZE, NRP AS REQ'D)	652	IVE
1	EA	CLASSROOM SECURITY	L9071T 06A	626	SCH
2	EA	FSIC CORE	23-030	626	SCH
1	EA	SURFACE CLOSER	4040XP EDA	689	LCN
1	EA	KICK PLATE	K0050 10"	630	TRI
1	EA	WALL MAG HOLD OPEN	SEM7800 SERIES	✎ 689	LCN
1	EA	GASKETING	488SBK PSA	BK	ZER

Hardware Group No. 26

For use on Door #(s):

D128-1	D128-2	D134-1	D134-2	E109-1	E109-2
E124	E127				

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	SET	INTERIOR HINGE	5BB1 SERIES (QTY, WEIGHT, SIZE, NRP AS REQ'D)	652	IVE
1	EA	CLASSROOM SECURITY	L9071T 06A	626	SCH
2	EA	FSIC CORE	23-030	626	SCH
1	EA	SURFACE CLOSER	4040XP EDA	689	LCN
1	EA	KICK PLATE	K0050 10"	630	TRI
1	EA	WALL STOP	1270CVSV	626	TRI
1	EA	GASKETING	488SBK PSA	BK	ZER

Hardware Group No. 26.01

For use on Door #(s):

C130

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	SET	INTERIOR HINGE	5BB1 SERIES (QTY, WEIGHT, SIZE, NRP AS REQ'D)	652	IVE
1	EA	CLASSROOM SECURITY	L9071T 06A	626	SCH
2	EA	FSIC CORE	23-030	626	SCH
1	EA	OH STOP	90S	630	GLY
1	EA	KICK PLATE	K0050 10"	630	TRI
1	EA	GASKETING	488SBK PSA	BK	ZER

Hardware Group No. 27

For use on Door #(s):

D124	E144-1
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Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	SET	INTERIOR HINGE	5BB1 SERIES (QTY, WEIGHT, SIZE, NRP AS REQ'D)	652	IVE
1	EA	CLASSROOM SECURITY	L9071T 06A	626	SCH
2	EA	FSIC CORE	23-030	626	SCH
1	EA	SURFACE CLOSER (W/ SPRING STOP)	4040XP SCUSH	689	LCN
1	EA	KICK PLATE	K0050 10"	630	TRI
1	EA	GASKETING	488SBK PSA	BK	ZER

Hardware Group No. 28 - Not Used

Hardware Group No. 29

For use on Door #(s):

B137	B138	B150	B233	C104	D139
D140	E123	E130-1	E142	E202-1	E202-2
F105					

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	SET	INTERIOR HINGE	5BB1 SERIES (QTY, WEIGHT, SIZE, NRP AS REQ'D)	652	IVE
1	EA	STOREROOM LOCK	L9080T 06A	626	SCH
1	EA	FSIC CORE	23-030	626	SCH
1	EA	SURFACE CLOSER	4040XP EDA	689	LCN
1	EA	KICK PLATE	K0050 10"	630	TRI
1	EA	WALL STOP	1270CVSV	626	TRI
1	EA	GASKETING	488SBK PSA	BK	ZER

Hardware Group No. 30

For use on Door #(s):

E152-1	C208	E147	E149	E153	G106-1
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Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
2	SET	INTERIOR HINGE	5BB1 SERIES (QTY, WEIGHT, SIZE, NRP AS REQ'D)	652	IVE
1	EA	CONST LATCHING BOLT	FB51P/61P AS REQ'D BY DOOR MATERIAL	630	IVE
1	EA	DUST PROOF STRIKE	DP1/ DP2 AS REQ'D	626	IVE
1	EA	STOREROOM LOCK	L9080T 06A	626	SCH
1	EA	FSIC CORE	23-030	626	SCH
1	EA	COORDINATOR	COR X FL X MB AS REQUIRED	628	IVE
2	EA	SURFACE CLOSER (W/ SPRING STOP)	4040XP SCUSH X ST-2648	689	LCN
2	EA	KICK PLATE	K0050 10"	630	TRI
1	EA	GASKETING	488SBK PSA	BK	ZER
1	EA	OVERLAPPING ASTRAGAL	383AA	AA	ZER

Hardware Group No. 31

For use on Door #(s):

A119 A219 B133 B232 E108

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	SET	INTERIOR HINGE	5BB1 SERIES (QTY, WEIGHT, SIZE, NRP AS REQ'D)	652	IVE
1	EA	STOREROOM LOCK	L9080T 06A	626	SCH
1	EA	FSIC CORE	23-030	626	SCH
1	EA	SURFACE CLOSER (W/ SPRING STOP)	4040XP SCUSH	689	LCN
1	EA	KICK PLATE	K0050 10"	630	TRI
1	EA	GASKETING	488SBK PSA	BK	ZER

Hardware Group No. 32

For use on Door #(s):

D112

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
2	SET	INTERIOR HINGE	5BB1 SERIES (QTY, WEIGHT, SIZE, NRP AS REQ'D)	652	IVE
1	EA	CONST LATCHING BOLT	FB51P/61P AS REQ'D BY DOOR MATERIAL	630	IVE
1	EA	DUST PROOF STRIKE	DP1/ DP2 AS REQ'D	626	IVE
1	EA	STOREROOM LOCK	L9080T 06A	626	SCH
1	EA	FSIC CORE	23-030	626	SCH
1	EA	SURFACE CLOSER	4040XP EDA @ ACTIVE LEAF	689	LCN
2	EA	KICK PLATE	K0050 10"	630	TRI
2	EA	WALL STOP	1270CVSV	626	TRI
1	EA	GASKETING	488SBK PSA	BK	ZER
1	EA	OVERLAPPING ASTRAGAL	383AA	AA	ZER

Hardware Group No. 33

For use on Door #(s):

F106 F108 G104-1 G104-2

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
2	SET	INTERIOR HINGE	5BB1 SERIES (QTY, WEIGHT, SIZE, NRP AS REQ'D)	652	IVE
1	EA	CONST LATCHING BOLT	FB51P/61P AS REQ'D BY DOOR MATERIAL	630	IVE
1	EA	DUST PROOF STRIKE	DP1/ DP2 AS REQ'D	626	IVE
1	EA	STOREROOM LOCK	L9080T 06A	626	SCH
1	EA	FSIC CORE	23-030	626	SCH
2	EA	OH STOP	90S	630	GLY
2	EA	KICK PLATE	K0050 10"	630	TRI
1	EA	GASKETING	488SBK PSA	BK	ZER
1	EA	OVERLAPPING ASTRAGAL	383AA	AA	ZER

Hardware Group No. 34 - Not Used

Hardware Group No. 35

For use on Door #(s):

A120 A124 A220 B127 B130 B228
D125 E204

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	SET	INTERIOR HINGE	5BB1 SERIES (QTY, WEIGHT, SIZE, NRP AS REQ'D)	652	IVE
1	EA	STOREROOM LOCK	L9080T 06A	626	SCH
1	EA	FSIC CORE	23-030	626	SCH
1	EA	SURFACE CLOSER (W/ HOLD OPEN)	4040XP HEDA	689	LCN
1	EA	KICK PLATE	K0050 10"	630	TRI
1	EA	WALL STOP	1270CVSV	626	TRI
1	EA	GASKETING	488SBK PSA	BK	ZER

Hardware Group No. 36

For use on Door #(s):

A118 A218 B132 B230

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	SET	INTERIOR HINGE	5BB1 SERIES (QTY, WEIGHT, SIZE, NRP AS REQ'D)	652	IVE
1	EA	STOREROOM LOCK	L9080T 06A	626	SCH
1	EA	FSIC CORE	23-030	626	SCH
1	EA	FAIL SECURE ELECTRIC STRIKE	6211 FSE	✎ 630	VON
1	EA	SURFACE CLOSER (W/ SPRING STOP)	4040XP SCUSH	689	LCN
1	EA	KICK PLATE	K0050 10"	630	TRI
1	EA	GASKETING	488SBK PSA	BK	ZER
1	EA	LOW VOLTAGE POWER*	BY DIV 28	✎	
1	EA	CARD READER*	BY DIV 28	✎	

FREE EGRESS AT ALL TIMES.

VALID CREDENTIAL MOMENTARILY RELEASES ELECTRIC STRIKE, ALLOWING ENTRY.

MECHANICAL KEY OVERRIDE.

ON LOSS OF POWER, ELECTRIFIED HARDWARE IS DISABLED. DOOR IS LATCHED. TRIM REMAINS SECURE.

Hardware Group No. 37

For use on Door #(s):

B140 D137

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	SET	INTERIOR HINGE	5BB1 SERIES (QTY, WEIGHT, SIZE, NRP AS REQ'D)	652	IVE
1	EA	STOREROOM LOCK	L9080T 06A	626	SCH
1	EA	FSIC CORE	23-030	626	SCH
1	EA	FAIL SECURE ELECTRIC STRIKE	6211 FSE	✎ 630	VON
1	EA	SURFACE CLOSER	4040XP EDA	689	LCN
1	EA	KICK PLATE	K0050 10"	630	TRI
1	EA	WALL STOP	1270CVSV	626	TRI
1	EA	GASKETING	488SBK PSA	BK	ZER
1	EA	LOW VOLTAGE POWER*	BY DIV 28	✎	
1	EA	CARD READER*	BY DIV 28	✎	

FREE EGRESS AT ALL TIMES.

VALID CREDENTIAL MOMENTARILY RELEASES ELECTRIC STRIKE, ALLOWING ENTRY.

MECHANICAL KEY OVERRIDE.

ON LOSS OF POWER, ELECTRIFIED HARDWARE IS DISABLED. DOOR IS LATCHED. TRIM REMAINS SECURE.

Hardware Group No. 38 - Not Used

Hardware Group No. 39

For use on Door #(s):

C123 C124 D117 D127 D133

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	SET	INTERIOR HINGE	5BB1 SERIES (QTY, WEIGHT, SIZE, NRP AS REQ'D)	652	IVE
1	EA	PRIVACY LOCK (W/ OCC/VAC INDICATOR)	L9040 06A L583-363	626	SCH
1	EA	SURFACE CLOSER	4040XP EDA	689	LCN
1	EA	KICK PLATE	K0050 10"	630	TRI
1	EA	WALL STOP	1270CVSV	626	TRI
1	EA	GASKETING	488SBK PSA	BK	ZER

Hardware Group No. 39.01

For use on Door #(s):

A121 A221 B131 B229 E125 E126

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	SET	INTERIOR HINGE	5BB1 SERIES (QTY, WEIGHT, SIZE, NRP AS REQ'D)	652	IVE
1	EA	PRIVACY SET (W/ OCC/VAC INDICATOR)	L9056T 06A L583-363 OS-OCC	626	SCH
1	EA	FSIC CORE	23-030	626	SCH
1	EA	SURFACE CLOSER	4040XP EDA	689	LCN
1	EA	KICK PLATE	K0050 10"	630	TRI
1	EA	WALL STOP	1270CVSV	626	TRI
1	EA	GASKETING	488SBK PSA	BK	ZER

Hardware Group No. 40 - Not Used

Hardware Group No. 40.01

For use on Door #(s):

B105 E107

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	SET	INTERIOR HINGE	5BB1 SERIES (QTY, WEIGHT, SIZE, NRP AS REQ'D)	652	IVE
1	EA	PRIVACY SET (W/ OCC/VAC INDICATOR)	L9056T 06A L583-363 OS-OCC	626	SCH
1	EA	FSIC CORE	23-030	626	SCH
1	EA	SURFACE CLOSER (W/ SPRING STOP)	4040XP SCUSH	689	LCN
1	EA	KICK PLATE	K0050 10"	630	TRI
1	EA	GASKETING	488SBK PSA	BK	ZER

Hardware Group No. 41

For use on Door #(s):

C129

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	SET	INTERIOR HINGE	5BB1 SERIES (QTY, WEIGHT, SIZE, NRP AS REQ'D)	652	IVE
1	EA	PRIVACY LOCK (W/ OCC/VAC INDICATOR)	L9040 06A L583-363	626	SCH
1	EA	KICK PLATE	K0050 10"	630	TRI
1	EA	WALL STOP	1270CVSV	626	TRI
1	EA	GASKETING	488SBK PSA	BK	ZER

Hardware Group No. 42 - Not Used

Hardware Group No. 43 - Not Used

Hardware Group No. 44 - Not Used

Hardware Group No. 45 - Not Used

Hardware Group No. 46

For use on Door #(s):

E145-2 E148-2

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
2	SET	INTERIOR HINGE	5BB1 SERIES (QTY, WEIGHT, SIZE, NRP AS REQ'D)	652	IVE
2	EA	PUSH PLATE	8200 6" X 16"	630	IVE
2	EA	PULL PLATE	8303 10" 6" X 16"	630	IVE
2	EA	SURFACE CLOSER	4040XP EDA	689	LCN
2	EA	KICK PLATE	K0050 10"	630	TRI
2	EA	WALL MAG HOLD OPEN	SEM7800 SERIES	✓ 689	LCN
1	SET	TWO PIECE MEETING STILE	328AA-S	AA	ZER
1	EA	GASKETING	488SBK PSA	BK	ZER

Hardware Group No. 47

For use on Door #(s):

D130-1 D130-2 D136-1 D136-2

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	SET	EXTERIOR HINGE	5BB1 (SIZE, QTY, WEIGHT, NRP AS REQ'D)	630	IVE
1	EA	PUSH PLATE	8200 6" X 16"	630	IVE
1	EA	PULL PLATE	8303 10" 6" X 16"	630	IVE
1	EA	SURFACE CLOSER	4040XP EDA	689	LCN
1	EA	KICK PLATE	K0050 10"	630	TRI
1	EA	WALL STOP	1270CVSV	626	TRI
1	EA	GASKETING	488SBK PSA	BK	ZER

Hardware Group No. 48

For use on Door #(s):

E105 E106 E143 F102

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	SET	INTERIOR HINGE	5BB1 SERIES (QTY, WEIGHT, SIZE, NRP AS REQ'D)	652	IVE
1	EA	PUSH PLATE	8200 6" X 16"	630	IVE
1	EA	PULL PLATE	8303 10" 6" X 16"	630	IVE
1	EA	SURFACE CLOSER	4040XP EDA	689	LCN
1	EA	KICK PLATE	K0050 10"	630	TRI
1	EA	WALL STOP	1270CVSV	626	TRI
1	EA	GASKETING	488SBK PSA	BK	ZER

Hardware Group No. AL-01

For use on Door #(s):

B101-1 B100-1 C100-1 C113-1

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
2	EA	CONTINUOUS HINGE	112XY EPT (MATCH STOREFRONT FINISH)	CPC	IVE
2	EA	POWER TRANSFER	EPT10	✓ 689	VON
1	EA	REMOVABLE MULLION	KR4954 STAB	689	VON
1	EA	ELEC PANIC HARDWARE (W/ RX, LX SWITCH)	LX-RX-QEL-99-NL 24 VDC	✓ 626	VON
1	EA	ELEC PANIC HARDWARE (W/ RX SWITCH)	RX-QEL-99-DT 24 VDC	✓ 626	VON
1	EA	MORTISE CYLINDER	20-061 ICX	626	SCH
1	EA	RIM CYLINDER	20-057 ICX	626	SCH
1	EA	FSIC CORE	23-030	626	SCH
1	EA	SURFACE CLOSER	4040XP EDA	689	LCN
1	SET	CLOSER BRACKET(S)	AS REQ'D TO INSTALL CLOSER	689	LCN
1	EA	SURF. AUTO OPERATOR	4642 (USE FLUSH CEILING MOUNT)	✓ 689	LCN
1	EA	WEATHER RING	8310-801	PLA	LCN
2	EA	4.75" SQUARE HARDWIRED ACTUATOR	8310-853T	✓	LCN
2	EA	ACTUATOR MOUNTING BOX	8310-867F		LCN
2	EA	WIND BOLLARD	REF DETAIL 1A/A9.1 & 2A/A9.1		
1	EA	MULLION SEAL	8780N	BK	ZER
1	SET	SEALS	PROVIDED BY ALUM DOOR/FRAME MFG		
2	EA	DOOR BOTTOM	PROVIDED BY ALUM DOOR/FRAME MFG		
1	EA	SADDLE THRESHOLD	1/2" HIGH X DEPTH AS REQ'D BY SILL DETAIL	AL	ZER
1	EA	LOW VOLTAGE POWER*	BY DIV 28	✓	
1	EA	CARD READER*	BY DIV 28	✓	
2	EA	DOOR POSITION SWITCH*	BY DIV 28 (COORDINATE REQ'D PREP WITH SECURITY CONTRACTOR)	✓	

AUTO OPERATOR REQUIRES 120 V CONNECTION.

HARDWARE FINISH: MATCH FINISH OF DOOR AND FRAME.

FREE EGRESS AT ALL TIMES.

OPEN MODE: ACCESS CONTROL SYSTEM TIME CLOCK ELECTRICALLY KEEPS LATCH RETRACTED, ALLOWING ENTRY.

CLOSED MODE: AUTHORIZED CREDENTIAL MOMENTARILY RETRACTS LATCHBOLT, ALLOWING ENTRY. OUTER ACTUATOR IS DISABLED AFTER HOURS BY ACCESS CONTROL TIME CLOCK.

VALID CREDENTIAL AT CARD READER ENABLES OUTER ACTUATOR. INNER ACTUATOR IS ALWAYS ENABLED. IF DOOR IS LATCHED WHEN ENABLED ACTUATOR IS DEPRESSED,

OPERATOR RETRACTS LATCHES PRIOR TO OPENING.

DURING CLOSED HOURS: RX SWITCH (INTEGRAL TO LOCKING HARDWARE) WILL SHUNT THE DOOR CONTACT AND ALLOW FOR AUTHORIZED EGRESS.

DOOR CONTACT MONITORS WHEN DOOR OPENS AND CLOSES.

ON LOSS OF POWER, ELECTRIFIED HARDWARE IS DISABLED. DOOR IS LATCHED. TRIM REMAINS SECURE.

Hardware Group No. AL-02

For use on Door #(s):
C112-3

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
2	EA	CONTINUOUS HINGE	112XY EPT (MATCH STOREFRONT FINISH)	CPC	IVE
2	EA	POWER TRANSFER	EPT10	✓ 689	VON
1	EA	REMOVABLE MULLION	KR4954 STAB	689	VON
1	EA	ELEC PANIC HARDWARE (W/ RX, LX SWITCH)	LX-RX-QEL-99-NL 24 VDC	✓ 626	VON
1	EA	ELEC PANIC HARDWARE (W/ RX SWITCH)	RX-QEL-99-DT 24 VDC	✓ 626	VON
1	EA	MORTISE CYLINDER	20-061 ICX	626	SCH
1	EA	RIM CYLINDER	20-057 ICX	626	SCH
1	EA	FSIC CORE	23-030	626	SCH
2	EA	OH STOP	90S	630	GLY
1	EA	SURFACE CLOSER	4040XP EDA SPEC ST-2731	689	LCN
1	SET	CLOSER BRACKET(S)	AS REQ'D TO INSTALL CLOSER	689	LCN
1	EA	SURF. AUTO OPERATOR	4642 (USE FLUSH CEILING MOUNT)	✓ 689	LCN
2	EA	4.75" SQUARE HARDWIRED ACTUATOR	8310-853T	✓	LCN
2	EA	ACTUATOR MOUNTING BOX	8310-867F		LCN
1	EA	MULLION SEAL	8780N	BK	ZER
1	SET	SEALS	PROVIDED BY ALUM DOOR/FRAME MFG		
1	EA	LOW VOLTAGE POWER*	BY DIV 28	✓	
1	EA	CARD READER*	BY DIV 28	✓	
2	EA	DOOR POSITION SWITCH*	BY DIV 28 (COORDINATE REQ'D PREP WITH SECURITY CONTRACTOR)	✓	

AUTO OPERATOR REQUIRES 120 V CONNECTION.

HARDWARE FINISH: MATCH FINISH OF DOOR AND FRAME.

FREE EGRESS AT ALL TIMES.

OPEN MODE: ACCESS CONTROL SYSTEM TIME CLOCK ELECTRICALLY KEEPS LATCH RETRACTED, ALLOWING ENTRY.

CLOSED MODE: AUTHORIZED CREDENTIAL MOMENTARILY RETRACTS LATCHBOLT, ALLOWING ENTRY. OUTER ACTUATOR IS DISABLED AFTER HOURS BY ACCESS CONTROL TIME CLOCK.

VALID CREDENTIAL AT CARD READER ENABLES OUTER ACTUATOR. INNER ACTUATOR IS ALWAYS ENABLED. IF DOOR IS LATCHED WHEN ENABLED ACTUATOR IS DEPRESSED, OPERATOR RETRACTS LATCHES PRIOR TO OPENING.

DURING CLOSED HOURS: RX SWITCH (INTEGRAL TO LOCKING HARDWARE) WILL SHUNT THE DOOR CONTACT AND ALLOW FOR AUTHORIZED EGRESS.

DOOR CONTACT MONITORS WHEN DOOR OPENS AND CLOSES.

ON LOSS OF POWER, ELECTRIFIED HARDWARE IS DISABLED. DOOR IS LATCHED. TRIM REMAINS SECURE.

Hardware Group No. AL-03

For use on Door #(s):

B101-2 C113-2

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
2	EA	CONTINUOUS HINGE	112XY EPT (MATCH STOREFRONT FINISH)	CPC	IVE
2	EA	POWER TRANSFER	EPT10	✓ 689	VON
1	EA	REMOVABLE MULLION	KR4954 STAB	689	VON
2	EA	ELEC PANIC HARDWARE (W/ RX SWITCH)	RX-QEL-99-DT 24 VDC	✓ 626	VON
1	EA	MORTISE CYLINDER	20-061 ICX	626	SCH
1	EA	FSIC CORE	23-030	626	SCH
2	EA	SURFACE CLOSER	4040XP EDA	689	LCN
2	SET	CLOSER BRACKET(S)	AS REQ'D TO INSTALL CLOSER	689	LCN
2	EA	WIND BOLLARD	REF DETAIL 1A/A9.1 & 2A/A9.1		
1	EA	MULLION SEAL	8780N	BK	ZER
1	SET	SEALS	PROVIDED BY ALUM DOOR/FRAME MFG		
2	EA	DOOR BOTTOM	PROVIDED BY ALUM DOOR/ FRAME MFG		
1	EA	SADDLE THRESHOLD	1/2" HIGH X DEPTH AS REQ'D BY SILL DETAIL	AL	ZER
1	EA	LOW VOLTAGE POWER*	BY DIV 28	✓	
2	EA	DOOR POSITION SWITCH*	BY DIV 28 (COORDINATE REQ'D PREP WITH SECURITY CONTRACTOR)	✓	

HARDWARE FINISH: MATCH FINISH OF DOOR AND FRAME.

FREE EGRESS AT ALL TIMES.

OPEN MODE: ACCESS CONTROL SYSTEM TIME CLOCK ELECTRICALLY KEEPS LATCH
RETRACTED, ALLOWING ENTRY.

CLOSED MODE: NO ENTRY.

DURING CLOSED HOURS: RX SWITCH (INTEGRAL TO LOCKING HARDWARE) WILL SHUNT THE
DOOR CONTACT AND ALLOW FOR AUTHORIZED EGRESS.

DOOR CONTACT MONITORS WHEN DOOR OPENS AND CLOSES.

ON LOSS OF POWER, ELECTRIFIED HARDWARE IS DISABLED. DOOR IS LATCHED. TRIM
REMAINS SECURE.

Hardware Group No. AL-04

For use on Door #(s):

C112-4 F115-2 F115-3

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
2	EA	CONTINUOUS HINGE	112XY EPT (MATCH STOREFRONT FINISH)	CPC	IVE
2	EA	POWER TRANSFER	EPT10	✓ 689	VON
1	EA	REMOVABLE MULLION	KR4954 STAB	689	VON
2	EA	ELEC PANIC HARDWARE (W/ RX SWITCH)	RX-QEL-99-DT 24 VDC	✓ 626	VON
1	EA	MORTISE CYLINDER	20-061 ICX	626	SCH
1	EA	FSIC CORE	23-030	626	SCH
2	EA	OH STOP	90S	630	GLY
2	EA	SURFACE CLOSER	4040XP EDA SPEC ST-2731	689	LCN
2	SET	CLOSER BRACKET(S)	AS REQ'D TO INSTALL CLOSER	689	LCN
1	EA	MULLION SEAL	8780N	BK	ZER
1	SET	SEALS	PROVIDED BY ALUM DOOR/FRAME MFG		
1	EA	LOW VOLTAGE POWER*	BY DIV 28	✓	
2	EA	DOOR POSITION SWITCH*	BY DIV 28 (COORDINATE REQ'D PREP WITH SECURITY CONTRACTOR)	✓	

HARDWARE FINISH: MATCH FINISH OF DOOR AND FRAME.

FREE EGRESS AT ALL TIMES.

OPEN MODE: ACCESS CONTROL SYSTEM TIME CLOCK ELECTRICALLY KEEPS LATCH
RETRACTED, ALLOWING ENTRY.

CLOSED MODE: NO ENTRY.

DURING CLOSED HOURS: RX SWITCH (INTEGRAL TO LOCKING HARDWARE) WILL SHUNT THE
DOOR CONTACT AND ALLOW FOR AUTHORIZED EGRESS.

DOOR CONTACT MONITORS WHEN DOOR OPENS AND CLOSES.

ON LOSS OF POWER, ELECTRIFIED HARDWARE IS DISABLED. DOOR IS LATCHED. TRIM
REMAINS SECURE.

Hardware Group No. AL-05

For use on Door #(s):

A100-1 E100-1 E104-1 G100-1

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
2	EA	CONTINUOUS HINGE	112XY EPT (MATCH STOREFRONT FINISH)	CPC	IVE
2	EA	POWER TRANSFER	EPT10	✓ 689	VON
1	EA	REMOVABLE MULLION	KR4954 STAB	689	VON
1	EA	ELEC PANIC HARDWARE (W/ RX SWITCH)	RX-QEL-99-DT 24 VDC	✓ 626	VON
1	EA	ELEC PANIC HARDWARE (W/ RX SWITCH)	RX-QEL-99-NL 24 VDC	✓ 626	VON
1	EA	MORTISE CYLINDER	20-061 ICX	626	SCH
1	EA	RIM CYLINDER	20-057 ICX	626	SCH
1	EA	FSIC CORE	23-030	626	SCH
2	EA	SURFACE CLOSER	4040XP EDA	689	LCN
2	SET	CLOSER BRACKET(S)	AS REQ'D TO INSTALL CLOSER	689	LCN
2	EA	WIND BOLLARD	REF DETAIL 1A/A9.1 & 2A/A9.1		
1	EA	MULLION SEAL	8780N	BK	ZER
1	SET	SEALS	PROVIDED BY ALUM DOOR/FRAME MFG		
2	EA	DOOR BOTTOM	PROVIDED BY ALUM DOOR/ FRAME MFG		
1	EA	SADDLE THRESHOLD	1/2" HIGH X DEPTH AS REQ'D BY SILL DETAIL	AL	ZER
1	EA	LOW VOLTAGE POWER*	BY DIV 28	✓	
1	EA	CARD READER*	BY DIV 28	✓	
2	EA	DOOR POSITION SWITCH*	BY DIV 28 (COORDINATE REQ'D PREP WITH SECURITY CONTRACTOR)	✓	

HARDWARE FINISH: MATCH FINISH OF DOOR AND FRAME.

FREE EGRESS AT ALL TIMES.

OPEN MODE: ACCESS CONTROL SYSTEM TIME CLOCK ELECTRICALLY KEEPS LATCH RETRACTED, ALLOWING ENTRY.

CLOSED MODE: AUTHORIZED CREDENTIAL MOMENTARILY RETRACTS LATCHBOLT, ALLOWING ENTRY.

DURING CLOSED HOURS: RX SWITCH (INTEGRAL TO LOCKING HARDWARE) WILL SHUNT THE DOOR CONTACT AND ALLOW FOR AUTHORIZED EGRESS.

DOOR CONTACT MONITORS WHEN DOOR OPENS AND CLOSES.

ON LOSS OF POWER, ELECTRIFIED HARDWARE IS DISABLED. DOOR IS LATCHED. TRIM REMAINS SECURE.

Hardware Group No. AL-05.01

For use on Door #(s):

F115-1

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
2	EA	CONTINUOUS HINGE	112XY EPT (MATCH STOREFRONT FINISH)	CPC	IVE
2	EA	POWER TRANSFER	EPT10	✓ 689	VON
1	EA	REMOVABLE MULLION	KR4954 STAB	689	VON
1	EA	ELEC PANIC HARDWARE (W/ RX SWITCH)	RX-QEL-99-DT 24 VDC	✓ 626	VON
1	EA	ELEC PANIC HARDWARE (W/ RX SWITCH)	RX-QEL-99-NL 24 VDC	✓ 626	VON
1	EA	MORTISE CYLINDER	20-061 ICX	626	SCH
1	EA	RIM CYLINDER	20-057 ICX	626	SCH
1	EA	FSIC CORE	23-030	626	SCH
2	EA	OH STOP	90S	630	GLY
2	EA	SURFACE CLOSER	4040XP EDA SPEC ST-2731	689	LCN
2	SET	CLOSER BRACKET(S)	AS REQ'D TO INSTALL CLOSER	689	LCN
1	EA	MULLION SEAL	8780N	BK	ZER
1	SET	SEALS	PROVIDED BY ALUM DOOR/FRAME MFG		
2	EA	DOOR BOTTOM	PROVIDED BY ALUM DOOR/ FRAME MFG		
1	EA	SADDLE THRESHOLD	1/2" HIGH X DEPTH AS REQ'D BY SILL DETAIL	AL	ZER
1	EA	LOW VOLTAGE POWER*	BY DIV 28	✓	
1	EA	CARD READER*	BY DIV 28	✓	
2	EA	DOOR POSITION SWITCH*	BY DIV 28 (COORDINATE REQ'D PREP WITH SECURITY CONTRACTOR)	✓	

HARDWARE FINISH: MATCH FINISH OF DOOR AND FRAME.

FREE EGRESS AT ALL TIMES.

OPEN MODE: ACCESS CONTROL SYSTEM TIME CLOCK ELECTRICALLY KEEPS LATCH
RETRACTED, ALLOWING ENTRY.

CLOSED MODE: AUTHORIZED CREDENTIAL MOMENTARILY RETRACTS LATCHBOLT, ALLOWING
ENTRY.

DURING CLOSED HOURS: RX SWITCH (INTEGRAL TO LOCKING HARDWARE) WILL SHUNT THE
DOOR CONTACT AND ALLOW FOR AUTHORIZED EGRESS.

DOOR CONTACT MONITORS WHEN DOOR OPENS AND CLOSES.

ON LOSS OF POWER, ELECTRIFIED HARDWARE IS DISABLED. DOOR IS LATCHED. TRIM
REMAINS SECURE.

Hardware Group No. AL-06

For use on Door #(s):

C102-1 C106-1

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	CONTINUOUS HINGE	112XY (MATCH STOREFRONT FINISH)	CPC	IVE
1	EA	PANIC HARDWARE	LD-99-EO	626	VON
1	EA	SURFACE CLOSER	4040XP EDA	689	LCN
1	EA	WIND BOLLARD	REF DETAIL 1A/A9.1 & 2A/A9.1		
1	SET	SEALS	PROVIDED BY ALUM DOOR/FRAME MFG		
1	EA	DOOR BOTTOM	PROVIDED BY ALUM DOOR/FRAME MFG		
1	EA	SADDLE THRESHOLD	1/2" HIGH X DEPTH AS REQ'D BY SILL DETAIL	AL	ZER
1	EA	DOOR POSITION SWITCH*	BY DIV 28 (COORDINATE REQ'D PREP WITH SECURITY CONTRACTOR)	✓	

HARDWARE FINISH: MATCH FINISH OF DOOR AND FRAME.

EXIT ONLY. NO ENTRY.

DOOR CONTACT MONITORS WHEN DOOR OPENS AND CLOSES.

Hardware Group No. AL-06.01

For use on Door #(s):
E130-2

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	CONTINUOUS HINGE	112XY EPT (MATCH STOREFRONT FINISH)	CPC	IVE
1	EA	POWER TRANSFER	EPT10	✓ 689	VON
1	EA	ELEC PANIC HARDWARE (W/ RX SWITCH)	RX-QEL-99-NL 24 VDC	✓ 626	VON
1	EA	RIM CYLINDER	20-057 ICX	626	SCH
1	EA	FSIC CORE	23-030	626	SCH
1	EA	SURFACE CLOSER	4040XP EDA	689	LCN
1	EA	WIND BOLLARD	REF DETAIL 1A/A9.1 & 2A/A9.1		
1	SET	SEALS	PROVIDED BY ALUM DOOR/FRAME MFG		
1	EA	DOOR BOTTOM	PROVIDED BY ALUM DOOR/ FRAME MFG		
1	EA	SADDLE THRESHOLD	1/2" HIGH X DEPTH AS REQ'D BY SILL DETAIL	AL	ZER
1	EA	LOW VOLTAGE POWER*	BY DIV 28	✓	
1	EA	CARD READER*	BY DIV 28	✓	
1	EA	DOOR POSITION SWITCH*	BY DIV 28 (COORDINATE REQ'D PREP WITH SECURITY CONTRACTOR)	✓	

FREE EGRESS AT ALL TIMES.

AUTHORIZED CREDENTIAL MOMENTARILY RETRACTS LATCHBOLT, ALLOWING ENTRY.
RX SWITCH (INTEGRAL TO LOCKING HARDWARE) WILL SHUNT THE DOOR CONTACT AND
ALLOW FOR AUTHORIZED EGRESS.

DOOR CONTACT MONITORS WHEN DOOR OPENS AND CLOSES. MECHANICAL KEY OVERRIDE.
ON LOSS OF POWER, ELECTRIFIED HARDWARE IS DISABLED. DOOR IS LATCHED. TRIM
REMAINS SECURE.

Hardware Group No. AL-07

For use on Door #(s):

E134-1 E139-2

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
2	EA	CONTINUOUS HINGE	112XY (MATCH STOREFRONT FINISH)	CPC	IVE
1	EA	REMOVABLE MULLION	KR4954 STAB	689	VON
2	EA	PANIC HARDWARE	LD-99-EO	626	VON
1	EA	MORTISE CYLINDER	20-061 ICX	626	SCH
1	EA	FSIC CORE	23-030	626	SCH
2	EA	SURFACE CLOSER	4040XP EDA	689	LCN
2	SET	CLOSER BRACKET(S)	AS REQ'D TO INSTALL CLOSER	689	LCN
2	EA	WIND BOLLARD	REF DETAIL 1A/A9.1 & 2A/A9.1		
1	EA	MULLION SEAL	8780N	BK	ZER
1	SET	SEALS	PROVIDED BY ALUM DOOR/FRAME MFG		
2	EA	DOOR BOTTOM	PROVIDED BY ALUM DOOR/FRAME MFG		
1	EA	SADDLE THRESHOLD	1/2" HIGH X DEPTH AS REQ'D BY SILL DETAIL	AL	ZER
2	EA	DOOR POSITION SWITCH*	BY DIV 28 (COORDINATE REQ'D PREP WITH SECURITY CONTRACTOR)	✈	

HARDWARE FINISH: MATCH FINISH OF DOOR AND FRAME.

FREE EGRESS AT ALL TIMES.

EXIT ONLY.

DOOR CONTACT MONITORS WHEN DOOR OPENS AND CLOSES.

Hardware Group No. AL-08

For use on Door #(s):

B100-2	B101-3	C100-2	C112-1	C228	F100-3
F100-4	F100-7	F100-8			

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
2	EA	CONTINUOUS HINGE	112XY (MATCH STOREFRONT FINISH)	CPC	IVE
2	EA	DUMMY PUSH BAR (W/ DUMMY PULL TRIM)	350-DT-990	626	VON
2	EA	OH STOP	90S	630	GLY
1	EA	SURFACE CLOSER	4040XP EDA SPEC ST-2731	689	LCN
1	SET	CLOSER BRACKET(S)	AS REQ'D TO INSTALL CLOSER	689	LCN
1	EA	SURF. AUTO OPERATOR	4642 (USE FLUSH CEILING MOUNT)	✓ 689	LCN
2	EA	4.75" SQUARE HARDWIRED ACTUATOR	8310-853T	✓	LCN
2	EA	ACTUATOR MOUNTING BOX	8310-867F		LCN
1	SET	SEALS	PROVIDED BY ALUM DOOR/FRAME MFG		

AUTO OPERATOR REQUIRES 120 V CONNECTION.

HARDWARE FINISH: MATCH FINISH OF DOOR AND FRAME.

PUSH/PULL. SIGNALING EITHER ACTUATOR SIGNALS AUTO OPERATOR TO OPEN DOOR.

Hardware Group No. AL-09

For use on Door #(s):
C127-1

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	SET	INTERIOR HINGE	5BB1 SERIES (QTY, WEIGHT, SIZE, NRP AS REQ'D)	652	IVE
1	EA	ELECTRIC HINGE	5BB1 SERIES TW8 (WEIGHT, SIZE, AS REQ'D)	✓ 652	IVE
1	EA	ELEC PANIC HARDWARE	QEL-99-L-NL-06 24 VDC	✓ 626	VON
1	EA	RIM CYLINDER	20-057 ICX	626	SCH
1	EA	FSIC CORE	23-030	626	SCH
1	EA	SURFACE CLOSER	4040XP EDA	689	LCN
1	EA	WALL STOP	1270CVSV	626	TRI
1	SET	SEALS	PROVIDED BY ALUM DOOR/FRAME MFG		
1	EA	LOW VOLTAGE POWER*	BY DIV 28	✓	
1	EA	CARD READER*	BY DIV 28	✓	

HARDWARE FINISH: MATCH FINISH OF DOOR AND FRAME.

FREE EGRESS AT ALL TIMES.

AUTHORIZED CREDENTIAL MOMENTARILY RETRACTS LATCHBOLT, ALLOWING ENTRY.
ON LOSS OF POWER, ELECTRIFIED HARDWARE IS DISABLED. DOOR IS LATCHED. TRIM REMAINS SECURE.

Hardware Group No. AL-10

For use on Door #(s):

A100-2	B101-4	C112-2	C229	E100-2	E100-2
F100-1	F100-2	F100-5	F100-6	G100-2	

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
2	EA	CONTINUOUS HINGE	112XY (MATCH STOREFRONT FINISH)	CPC	IVE
2	EA	DUMMY PUSH BAR (W/ DUMMY PULL TRIM)	350-DT-990	626	VON
2	EA	OH STOP	90S	630	GLY
2	EA	SURFACE CLOSER	4040XP EDA SPEC ST-2731	689	LCN
2	SET	CLOSER BRACKET(S)	AS REQ'D TO INSTALL CLOSER	689	LCN
1	SET	SEALS	PROVIDED BY ALUM DOOR/FRAME MFG		

HARDWARE FINISH: MATCH FINISH OF DOOR AND FRAME.

PUSH/PULL.

Hardware Group No. AL-11 - Not Used

Hardware Group No. AL-12 - Not Used

Hardware Group No. AL-13

For use on Door #(s):

F107-3

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
2	SET	INTERIOR HINGE	5BB1 SERIES (QTY, WEIGHT, SIZE, NRP AS REQ'D)	652	IVE
1	EA	FIRE RATED REMOVABLE MULLION	KR9954 STAB	689	VON
2	EA	FIRE EXIT HARDWARE	99-L-F-2SI-06	626	VON
1	EA	MORTISE CYLINDER	20-061 ICX	626	SCH
4	EA	RIM CYLINDER	20-057 ICX	626	SCH
5	EA	FSIC CORE	23-030	626	SCH
1	EA	SURFACE CLOSER	4040XP EDA	689	LCN
1	EA	SURFACE CLOSER (W/ SPRING STOP)	4040XP SCUSH	689	LCN
1	EA	WALL STOP	1270CVSV	626	TRI
1	EA	MULLION SEAL	8780N	BK	ZER
1	SET	SEALS	PROVIDED BY ALUM DOOR/FRAME MFG		

HARDWARE FINISH: MATCH FINISH OF DOOR AND FRAME.

Hardware Group No. AL-13.01

For use on Door #(s):

C203

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
2	SET	INTERIOR HINGE	5BB1 SERIES (QTY, WEIGHT, SIZE, NRP AS REQ'D)	652	IVE
1	EA	REMOVABLE MULLION	KR4954 STAB	689	VON
2	EA	PANIC HARDWARE	LD-99-L-2SI-06	626	VON
1	EA	MORTISE CYLINDER	20-061 ICX	626	SCH
4	EA	RIM CYLINDER	20-057 ICX	626	SCH
5	EA	FSIC CORE	23-030	626	SCH
2	EA	SURFACE CLOSER	4040XP EDA	689	LCN
2	EA	WALL MAG HOLD OPEN	SEM7800 SERIES	✓ 689	LCN
1	EA	GASKETING	488SBK PSA	BK	ZER
1	SET	SEALS	PROVIDED BY ALUM DOOR/FRAME MFG		

HARDWARE FINISH: MATCH FINISH OF DOOR AND FRAME.

Hardware Group No. AL-13.02

For use on Door #(s):
B101-6

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
2	SET	INTERIOR HINGE	5BB1 SERIES (QTY, WEIGHT, SIZE, NRP AS REQ'D)	652	IVE
1	EA	ELECTRIC HINGE	5BB1 SERIES TW8 (WEIGHT, SIZE, AS REQ'D)	✓ 652	IVE
1	EA	PANIC HARDWARE	LD-9927-EO-LBR	626	VON
1	EA	ELEC PANIC HARDWARE	QEL-9927-L-NL-LBR-06 24 VDC	✓ 626	VON
1	EA	RIM CYLINDER	20-057 ICX	626	SCH
1	EA	FSIC CORE	23-030	626	SCH
2	EA	SURFACE CLOSER	4040XP EDA	689	LCN
2	EA	WALL MAG HOLD OPEN	SEM7800 SERIES	✓ 689	LCN
1	SET	SEALS	PROVIDED BY ALUM DOOR/FRAME MFG		
1	EA	LOCKDOWN SYSTEM*	BY DIV 28	✓	
1	EA	LOW VOLTAGE POWER*	BY DIV 28	✓	
1	EA	CARD READER*	BY DIV 28	✓	

HARDWARE FINISH: MATCH FINISH OF DOOR AND FRAME.

DOORS ARE NORMALLY HELD OPEN ON MAGNETIC HOLD OPENS.

UPON LOSS OF POWER, SIGNAL FROM LOCKDOWN SYSTEM OR SIGNAL FROM FIRE ALARM;
MAGNETIC HOLD OPENS RELEASE DOORS, ALLOWING DOORS TO CLOSE AND LATCH.
DOORS ARE LOCKED WHEN CLOSED. VALID CREDENTIAL WILL MOMENTARILY RETRACT
LATCHBOLT. MECHANICAL KEY OVERRIDE.

Hardware Group No. AL-14

For use on Door #(s):
F107-1

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
2	SET	INTERIOR HINGE	5BB1 SERIES (QTY, WEIGHT, SIZE, NRP AS REQ'D)	652	IVE
1	EA	FIRE RATED REMOVABLE MULLION	KR9954 STAB	689	VON
2	EA	FIRE EXIT HARDWARE	99-EO-F	626	VON
1	EA	MORTISE CYLINDER	20-061 ICX	626	SCH
1	EA	FSIC CORE	23-030	626	SCH
1	EA	SURFACE CLOSER	4040XP EDA	689	LCN
1	EA	SURFACE CLOSER (W/ SPRING STOP)	4040XP SCUSH	689	LCN
1	EA	WALL STOP	1270CVSV	626	TRI
1	EA	MULLION SEAL	8780N	BK	ZER
1	SET	SEALS	PROVIDED BY ALUM DOOR/FRAME MFG		

HARDWARE FINISH: MATCH FINISH OF DOOR AND FRAME.

Hardware Group No. AL-15

For use on Door #(s):
F107-2

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
2	SET	INTERIOR HINGE	5BB1 SERIES (QTY, WEIGHT, SIZE, NRP AS REQ'D)	652	IVE
1	EA	FIRE RATED REMOVABLE MULLION	KR9954 STAB	689	VON
2	EA	FIRE EXIT HARDWARE	99-EO-F	626	VON
1	EA	MORTISE CYLINDER	20-061 ICX	626	SCH
1	EA	FSIC CORE	23-030	626	SCH
2	EA	SURFACE CLOSER (W/ SPRING STOP)	4040XP SCUSH	689	LCN
1	EA	MULLION SEAL	8780N	BK	ZER
1	SET	SEALS	PROVIDED BY ALUM DOOR/FRAME MFG		

HARDWARE FINISH: MATCH FINISH OF DOOR AND FRAME.

Hardware Group No. AL-16

For use on Door #(s):
C106-2

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	SET	INTERIOR HINGE	5BB1 SERIES (QTY, WEIGHT, SIZE, NRP AS REQ'D)	652	IVE
1	EA	PANIC HARDWARE	LD-99-L-2SI-06	626	VON
2	EA	RIM CYLINDER	20-057 ICX	626	SCH
2	EA	FSIC CORE	23-030	626	SCH
1	EA	SURFACE CLOSER	4040XP EDA	689	LCN
1	EA	WALL MAG HOLD OPEN	SEM7800 SERIES	✓ 689	LCN
1	SET	SEALS	PROVIDED BY ALUM DOOR/FRAME MFG		

HARDWARE FINISH: MATCH FINISH OF DOOR AND FRAME.

Hardware Group No. AL-17 - Not Used

Hardware Group No. AL-18 - Not Used

Hardware Group No. AL-19

For use on Door #(s):
E104-2

Provide each PR door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
2	EA	CONTINUOUS HINGE	112XY (MATCH STOREFRONT FINISH)	CPC	IVE
2	EA	DUMMY PUSH BAR (W/ DUMMY PULL TRIM)	350-DT-990	626	VON
2	EA	OH STOP	90S	630	GLY
2	EA	SURFACE CLOSER	4111 SPEC ST-2730	689	LCN
2	SET	CLOSER BRACKET(S)	AS REQ'D TO INSTALL CLOSER	689	LCN
1	SET	SEALS	PROVIDED BY ALUM DOOR/FRAME MFG		

HARDWARE FINISH: MATCH FINISH OF DOOR AND FRAME.

Hardware Group No. CO-01

For use on Door #(s):

B128	B129	B226	B227	A122	A123
A223	A222	E146			

Provide each CO door(s) with the following:

QTY	DESCRIPTION	CATALOG NUMBER	FINISH	MFR
CASED OPENING. NO HARDWARE REQUIRED.				

Hardware Group No. FLD-01

For use on Door #(s):

OP-01 OP-02

Provide each FLD door(s) with the following:

QTY	DESCRIPTION	CATALOG NUMBER	FINISH	MFR
ALL HARDWARE PROVIDED BY OPERABLE PARTITION MANUFACTURER.				

Hardware Group No. GATE-01

For use on Door #(s):

F106A	F106B	F106C	F106D	F106E	F106F
F108-1	F108-2	F108-3	F108-4	F108-5	SW-01
SW-02					

Provide each SGL door(s) with the following:

QTY	DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA CLASSROOM LOCK	L9070T 06A	626	SCH
1	EA FSIC CORE	23-030	626	SCH
1	EA WELDABLE GATE BOX FOR MORTISE LOCKSET	K-BXMOR1		KEE

BALANCE OF HARDWARE PROVIDED BY GATE FABRICATOR.

Hardware Group No. GATE-02

For use on Door #(s):

S101

Provide each SGL door(s) with the following:

QTY	DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	SET SELF CLOSING GATE HINGES	PROVIDED BY GATE FABRICATOR		
1	EA CLASSROOM LOCK	L9070T 06A	626	SCH
1	EA FSIC CORE	23-030	626	SCH
1	EA WELDABLE GATE BOX FOR MORTISE LOCKSET	K-BXMOR1		KEE

Hardware Group No. MISC-01

For use on Door #(s):

MISC

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	EXIT DEVICE MAINTENANCE KIT	050046		VON
1	EA	CLOSER ADJUSTMENT WRENCH	GHW12		LCN

Hardware Group No. OH-01

For use on Door #(s):

D100	D101-3	D107	D110-2	D110-3	D110-4
D119-3	D105-2	E130-3	E130-4	E137	E144-2
F101	B210-2	F107-8	F107-9	B214-2	F115
G102-3	G102-4				

Provide each RU door(s) with the following:

QTY	DESCRIPTION	CATALOG NUMBER	FINISH	MFR
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ALL HARDWARE PROVIDED BY OVERHEAD DOOR MANUFACTURER.

Hardware Group No. ST-01

For use on Door #(s):

C212-1 C212

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	SET	INTERIOR HINGE	5BB1 SERIES (QTY, WEIGHT, SIZE, NRP AS REQ'D)	652	IVE
1	EA	PANIC HARDWARE	99-L-BE-06-SNB	626	VON
1	EA	SURFACE CLOSER	4040XP EDA	689	LCN
1	EA	KICK PLATE	K0050 10"	630	TRI
1	EA	WALL STOP	1270CVSV	626	TRI
1	EA	GASKETING	488SBK PSA	BK	ZER

Hardware Group No. STC-01

For use on Door #(s):

E115 E116 E117-2 E117-1 E120

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	PASSAGE SET	L9010 06A	626	SCH
1	EA	KICK PLATE	K0050 10"	630	TRI
1	EA	WALL STOP	1270CVSV	626	TRI

CHANGE LOCKSET TO CYLINDRICAL AS REQUIRED BY STC SEAL SIZE. CYLINDRICAL PROVIDES OPTION TO EXEND BACKSET TO AVOID CONFLICT WITH STC SEAL.

STC ASSEMBLY (SEE SECTION 08 34 73): HINGES OR CAM LIFT HINGES (IF REQUIRED), PERIMETER SEALS, DOOR BOTTOM AND THRESHOLD (IF REQUIRED) ARE PROVIDED BY STC ASSEMBLY MANUFACTURER. PROVIDE HARDWARE STAND OFF BRACKETS AS REQUIRED FOR A CONTINUOUS SEAL INSTALLATION.

Hardware Group No. STC-02

For use on Door #(s):

E131-2 E132

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	CLASSROOM LOCK	L9070T 06A	626	SCH
1	EA	FSIC CORE	23-030	626	SCH
1	EA	KICK PLATE	K0050 10"	630	TRI
1	EA	WALL STOP	1270CVSV	626	TRI

CHANGE LOCKSET TO CYLINDRICAL AS REQUIRED BY STC SEAL SIZE. CYLINDRICAL PROVIDES OPTION TO EXEND BACKSET TO AVOID CONFLICT WITH STC SEAL.

STC ASSEMBLY (SEE SECTION 08 34 73): HINGES OR CAM LIFT HINGES (IF REQUIRED), PERIMETER SEALS, DOOR BOTTOM AND THRESHOLD (IF REQUIRED) ARE PROVIDED BY STC ASSEMBLY MANUFACTURER. PROVIDE HARDWARE STAND OFF BRACKETS AS REQUIRED FOR A CONTINUOUS SEAL INSTALLATION.

Hardware Group No. STC-03

For use on Door #(s):
E131-1

Provide each SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	CLASSROOM LOCK	L9070T 06A	626	SCH
1	EA	FSIC CORE	23-030	626	SCH
1	EA	OVERHEAD STOP	9020CL SERIES STOP	630	ABH
1	EA	KICK PLATE	K0050 10"	630	TRI

CHANGE LOCKSET TO CYLINDRICAL AS REQUIRED BY STC SEAL SIZE. CYLINDRICAL PROVIDES OPTION TO EXEND BACKSET TO AVOID CONFLICT WITH STC SEAL.

STC ASSEMBLY (SEE SECTION 08 34 73): HINGES OR CAM LIFT HINGES (IF REQUIRED), PERIMETER SEALS, DOOR BOTTOM AND THRESHOLD (IF REQUIRED) ARE PROVIDED BY STC ASSEMBLY MANUFACTURER. PROVIDE HARDWARE STAND OFF BRACKETS AS REQUIRED FOR A CONTINUOUS SEAL INSTALLATION.

Door#	HwSet#
A100-1 ✓	AL-05
A100-2	AL-10
A103 ✓	25
A104 ✓	25
A105 ✓	25
A106 ✓	25
A107 ✓	25
A108 ✓	25
A109 ✓	25
A110-1 ✓	09
A110-2 ✓	09
A111-1	21
A111-2	21
A112-1 ✓	09
A112-2 ✓	09
A113 ✓	25
A114 ✓	25
A115 ✓	25
A117-1 ✓	25
A117-2 ✓	25
A118 ✓	36
A119	31
A120	35
A121	39.01
A122	CO-01
A123	CO-01
A124	35
A125-1 ✓	25
A125-2 ✓	25
A201-1 ✓	09
A203 ✓	25
A204 ✓	25
A205 ✓	25
A206 ✓	25
A207 ✓	25
A208 ✓	25
A209 ✓	25
A210-1 ✓	09
A210-2 ✓	09
A211-1	21
A211-2	21
A212-1 ✓	09
A212-2 ✓	09
A213 ✓	25
A214 ✓	25
A215 ✓	25

Door#	HwSet#
A217-1 ✓	25
A217-2 ✓	25
A218 ✓	36
A219	31
A220	35
A221	39.01
A222	CO-01
A223	CO-01
A224-1 ✓	25
A224-2 ✓	25
B100-1 ✓	AL-01
B100-2 ✓	AL-08
B101-1 ✓	AL-01
B101-2 ✓	AL-03
B101-3 ✓	AL-08
B101-4	AL-10
B101-5 ✓	18.02
B101-6 ✓	AL-13.02
B102 ✓	19
B103 ✓	19
B104 ✓	25
B105	40.01
B106-1 ✓	25
B106-2 ✓	25
B108 ✓	25
B109 ✓	25
B110-1	24
B110-2 ✓	25
B111 ✓	25
B112 ✓	25
B113 ✓	25
B114 ✓	25
B115 ✓	25
B116 ✓	25
B118 ✓	25
B119 ✓	25
B120 ✓	25
B121 ✓	25
B122 ✓	25
B123 ✓	25
B124 ✓	25
B125 ✓	25
B126-1 ✓	25
B126-2 ✓	25
B127	35
B128	CO-01

DOOR HARDWARE

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Door#	HwSet#
B129	CO-01
B130	35
B131	39.01
B132 ✓	36
B133	31
B134-1 ✓	25
B134-2 ✓	25
B136-1 ✓	25
B136-2 ✓	25
B137	29
B138	29
B140 ✓	37
B141 ✓	25
B142 ✓	25
B143 ✓	25
B144-1 ✓	25
B145 ✓	25
B146 ✓	25
B147 ✓	25
B148 ✓	25
B150	29
B201-2 ✓	09
B202 ✓	19
B202 ✓	19
B203 ✓	19
B204 ✓	25
B205 ✓	25
B206 ✓	25
B207 ✓	25
B208-1 ✓	09
B208-2 ✓	09
B209 ✓	25
B210-1 ✓	25
B210-2	OH-01
B212-1 ✓	18.02
B212-2 ✓	18.01
B213 ✓	25
B214 ✓	25
B214-1 ✓	25
B214-2	OH-01
B215	24
B217 ✓	25
B218 ✓	25
B219 ✓	25
B220 ✓	25
B221 ✓	25

Door#	HwSet#
B222 ✓	25
B223 ✓	25
B225-1 ✓	25
B225-2 ✓	25
B226	CO-01
B227	CO-01
B228	35
B229	39.01
B230 ✓	36
B232	31
B232-1 ✓	25
B232-2 ✓	25
B233	29
C100-1 ✓	AL-01
C100-2 ✓	AL-08
C102-1 ✓	AL-06
C102-2 ✓	16
C104	29
C106-1 ✓	AL-06
C106-2 ✓	AL-16
C107 ✓	25
C108 ✓	25
C109 ✓	25
C110	24
C111 ✓	25
C112-1 ✓	AL-08
C112-2	AL-10
C112-3 ✓	AL-02
C112-4 ✓	AL-04
C113-1 ✓	AL-01
C113-2 ✓	AL-03
C114 ✓	25
C115 ✓	25
C117 ✓	25
C118 ✓	25
C119 ✓	25
C120 ✓	25
C121 ✓	25
C122	24
C123	39
C124	39
C125-1 ✓	25
C125-2 ✓	25
C126 ✓	25
C127-1 ✓	AL-09
C127-2 ✓	16

DOOR HARDWARE

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Door#	HwSet#
C129	41
C130	26.01
C132✓	25
C133	24
C203✓	AL-13.01
C204✓	25
C205	24
C205A✓	25
C206✓	25
C208	30
C212	ST-01
C212-1	ST-01
C228✓	AL-08
C229	AL-10
C230	
D100	OH-01
D101-1✓	18
D101-2✓	19
D101-3	OH-01
D103✓	08
D105	12
D105-2	OH-01
D106✓	25
D107	OH-01
D110-1✓	04
D110-2	OH-01
D110-3	OH-01
D110-4	OH-01
D111✓	25
D112	32
D113✓	25
D114✓	25
D115✓	25
D116	24
D117	39
D118-1✓	25
D118-2✓	25
D119-1	20.02
D119-2	20.01
D119-3	OH-01
D120	21
D123✓	09
D124	27
D125	35
D126	10.01
D127	39

DOOR HARDWARE

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Door#	HwSet#
D128-1	26
D128-2	26
D130-1	47
D130-2	47
D131	10.01
D132✓	09
D133	39
D134-1	26
D134-2	26
D136-1	47
D136-2	47
D137✓	37
D138	10.01
D139	29
D140	29
D1001	
E100-1✓	AL-05
E100-2	AL-10
E100-2	AL-10
E104-1✓	AL-05
E104-2	AL-19
E105	48
E106	48
E107	40.01
E108	31
E109-1	26
E109-2	26
E110-1✓	15
E110-2	11
E113✓	25
E114✓	25
E115	STC-01
E116	STC-01
E117-1	STC-01
E117-2	STC-01
E118-1✓	09
E118-2✓	15
E119✓	25
E120	STC-01
E121	22
E122-1✓	15
E122-2✓	09
E123	29
E124	26
E125	39.01
E126	39.01

Door#	HwSet#
E127	26
E128	20
E129 ✎	25
E129 ✎	25
E130-1	29
E130-2 ✎	AL-06.01
E130-3	OH-01
E130-4	OH-01
E130A	20
E131-1	STC-03
E131-2	STC-02
E131-3 ✎	25
E132	STC-02
E133 ✎	25
E134-1 ✎	AL-07
E134-2 ✎	09
E136	21
E137	OH-01
E138	24
E139-1 ✎	09
E139-2 ✎	AL-07
E141	24
E142	29
E143	48
E144-1	27
E144-2	OH-01
E145-1 ✎	06
E145-2 ✎	46
E146	CO-01
E147	30
E148-1 ✎	06
E148-2 ✎	46
E149	30
E150-1	13
E150-2	13
E151-1 ✎	06
E152-1	30
E152-2	23
E153	30
E155	23
E202-1	29
E202-2	29
E204	35
F100-1	AL-10
F100-2	AL-10
F100-3 ✎	AL-08

Door#	HwSet#
F100-4 ✓	AL-08
F100-5	AL-10
F100-6	AL-10
F100-7 ✓	AL-08
F100-8 ✓	AL-08
F101	OH-01
F102	48
F105	29
F106	33
F106A	GATE-01
F106B	GATE-01
F106C	GATE-01
F106D	GATE-01
F106E	GATE-01
F106F	GATE-01
F107-1	AL-14
F107-2	AL-15
F107-3	AL-13
F107-4	12
F107-5 ✓	05
F107-6 ✓	02
F107-7 ✓	05.01
F107-8	OH-01
F107-9	OH-01
F108	33
F108-1	GATE-01
F108-2	GATE-01
F108-3	GATE-01
F108-4	GATE-01
F108-5	GATE-01
F115	OH-01
F115-1 ✓	AL-05.01
F115-2 ✓	AL-04
F115-3 ✓	AL-04
G100-1 ✓	AL-05
G100-2	AL-10
G102-1 ✓	15
G102-2 ✓	15
G102-3	OH-01
G102-4	OH-01
G103-1	12
G103-2 ✓	05
G103-3 ✓	02
G104-1	33
G104-2	33
G105-1 ✓	15

DOOR HARDWARE

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Door#	HwSet#
G105-2✓	15
G106-1	30
G106-2✓	03
G107-1	14
G107-2✓	01
G108✓	25
G109✓	25
G110-1✓	25
G110-2✓	25
G111-1	24
G111-2✓	25
MISC	MISC-01
OP-01	FLD-01
OP-02	FLD-01
S101	GATE-02
S102	
S103	
SW-01	GATE-01
SW-02	GATE-01

END OF SECTION 087100

SECTION 088000 - GLAZING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

- A. Section includes:
 - 1. Glass for windows, doors, interior borrowed lites, storefront framing and glazed curtain walls.
 - 2. Laminated Glazing
 - 3. Decorative film on glass.
 - 4. Glazing sealants and accessories.
- B. Related Requirements:
 - 1. Section 012300 "Alternates" for additional requirements that may affect this section.
 - 2. Section 079200 "Joint Sealants."
 - 3. Section 081113 "Hollow Metal Doors and Frames."
 - 4. Section 081416 "Flush Wood Doors."
 - 5. Section 083613 "Sectional Overhead Doors."
 - 6. Section 084113 "Aluminum-Framed Entrances and Storefronts."
 - 7. Section 102800 "Toilet, Bath and Laundry Accessories" for toilet room mirrors.

1.03 DEFINITIONS

- A. Glass Manufacturers: Firms that produce primary glass, fabricated glass, or both, as defined in referenced glazing publications.
- B. Glass Thicknesses: Indicated by thickness designations in millimeters according to ASTM C 1036.
- C. IBC: International Building Code.
- D. Interspace: Space between lites of an insulating-glass unit.

1.04 COORDINATION

- A. Coordinate glazing channel dimensions to provide necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances.

1.05 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
2. Review temporary protection requirements for glazing during and after installation.

1.06 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Glass Samples: For each type of glass product other than clear monolithic vision glass; 12 inches (300 mm) square, including but not limited to:
 - C. Tinted glass.
 - D. Laminated glass.
 - E. Decorative film for glass.
 - F. Decorative glass panels.
 - G. Insulating glass.
- H. Glazing Accessory Samples: For sealants and colored spacers, in 12-inch (300-mm) lengths.
- I. Glazing Schedule: List glass types and thicknesses for each size opening and location. Use same designations indicated on Drawings.

1.07 INFORMATIONAL SUBMITTALS

- A. Sample Warranties: For special warranties.

1.08 QUALITY ASSURANCE

- A. An exterior wall mockup including masonry, window, flashings, copings, metal wall panels, insulation, glazing, sealants, etc. will be required for review by Architect before proceeding with Work. Provide glazing to the exterior wall mockup as indicated.

1.09 DELIVERY, STORAGE, AND HANDLING

- A. Protect glazing materials according to manufacturer's written Instructions. Prevent damage to glass and glazing materials from condensation, temperature changes, direct exposure to sun, or other causes.
- B. Comply with insulating-glass manufacturer's written instructions for venting and sealing units to avoid hermetic seal ruptures due to altitude change.

1.10 FIELD CONDITIONS

- A. Environmental Limitations: Do not proceed with glazing when ambient and substrate temperature conditions are outside limits permitted by glazing material manufacturers and when glazing channel substrates are wet from rain, frost, condensation, or other causes.

1. Do not install glazing sealants when ambient and substrate temperature conditions are outside limits permitted by sealant manufacturer or are below 40 deg F (4.4 deg C).

1.11 WARRANTY

- A. Manufacturer's Special Warranty for Laminated Glass: Manufacturer agrees to replace laminated- glass units that deteriorate within specified warranty period. Deterioration of laminated glass is defined as defects developed from normal use that are not attributed to glass breakage or to maintaining and cleaning laminated glass contrary to manufacturer's written instructions. Defects include edge separation, delamination materially obstructing vision through glass, and blemishes exceeding those allowed by referenced laminated-glass standard.
 1. Warranty Period: 10 years from date of Substantial Completion.
- B. Manufacturer's Special Warranty for Insulating Glass: Manufacturer agrees to replace insulating-glass units that deteriorate within specified warranty period. Deterioration of insulating glass is defined as failure of hermetic seal under normal use that is not attributed to glass breakage or to maintaining and cleaning insulating glass contrary to manufacturer's written instructions. Evidence of failure is the obstruction of vision by dust, moisture, or film on interior surfaces of glass.
 1. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Except for specialty glass products listed below, and subject to compliance with requirements, provide products by one of the following:
 1. Cardinal Glass Industries.
 2. Guardian Glass LLC.
 3. Oldcastle Building Envelope: www.oldcastlebe.com.
 4. Viracon.
 5. Vitro Architectural Glass (formerly PPG).
- B. Source Limitations: Except for specialty glass products listed below, obtain all products of this section from single source from single manufacturer.
- C. Specialty Glass Product – Fire-Rated Glazing: Provide products listed by Technical Glass Products or comparable products by Safti First.
- D. Source Limitations for Glazing Accessories: Obtain glazing accessories from the glass manufacturer. Products not available from the glass manufacturer be approved by glass manufacturer in writing.

2.02 PERFORMANCE REQUIREMENTS

- A. General: Installed glazing systems shall withstand normal thermal movement and wind and impact loads (where applicable) without failure, including loss or glass breakage attributable to the following: defective manufacture, fabrication, or installation; failure of sealants or gaskets to remain watertight and airtight; deterioration of glazing materials; or other defects in construction.
- B. Structural Performance: Glazing shall withstand the following design loads within limits and under conditions indicated determined according to the IBC and ASTM E 1300.
 - 1. Design Wind Pressures: As indicated on Drawings.
 - 2. Maximum Lateral Deflection: For glass supported on all four edges, limit center-of-glass deflection at design wind pressure to not more than 1/50 times the short-side length or 1 inch (25 mm), whichever is less.
 - 3. Differential Shading: Design glass to resist thermal stresses induced by differential shading within individual glass lites.
- C. Safety Glazing: Where safety glazing is indicated, provide glazing that complies with 16 CFR 1201, Category II.
- D. Thermal and Optical Performance Properties: Provide glass with performance properties specified, as indicated in manufacturer's published test data, based on procedures indicated below:
 - 1. For monolithic-glass lites, properties are based on units with lites 6 mm thick.
 - 2. For laminated-glass lites, properties are based on products of construction indicated.
 - 3. For insulating-glass units, properties are based on units of thickness indicated for overall unit and for each lite.
 - 4. U-Factors: Center-of-glazing values, according to NFRC 100 and based on LBL's WINDOW 5.2 computer program, expressed as Btu/sq. ft. x h x deg F (W/sq. m x K).
 - 5. Solar Heat-Gain Coefficient and Visible Transmittance: Center-of-glazing values, according to NFRC 200 and based on LBL's WINDOW 5.2 computer program.
 - 6. Visible Reflectance: Center-of-glazing values, according to NFRC 300.

2.03 GLASS PRODUCTS, GENERAL

- A. Glazing Publications: Comply with published recommendations of glass product manufacturers and organizations below unless more stringent requirements are indicated. See these publications for glazing terms not otherwise defined in this Section or in referenced standards.
 - 1. GANA Publications: "Laminated Glazing Reference Manual" and "Glazing Manual."
 - 2. IGMA Publication for Insulating Glass: SIGMA TM-3000, "North American Glazing Guidelines for Sealed Insulating Glass Units for Commercial and Residential Use."
- B. Safety Glazing Labeling: Where safety glazing is indicated, permanently mark glazing with certification label of the SGCC. Label shall indicate manufacturer's name, type of glass, thickness, and safety glazing standard with which glass complies.
- C. Insulating-Glass Certification Program: Permanently marked either on spacers or on at least one component lite of units with appropriate certification label of IGCC.

- D. Fire-Protection-Rated Glazing: Listed and labeled by a testing agency acceptable to authorities having jurisdiction, for fire-protection ratings indicated, based on positive-pressure testing according to NFPA 257 or UL 9, including the hose-stream test, and shall comply with NFPA 80.
- E. Fire-protection-rated glazing required to have a fire-protection rating of 20 minutes shall be exempt from the hose-stream test.
- F. Fire-Protection-Rated Glazing Labeling: Permanently mark fire-protection-rated glazing with certification label of a testing agency acceptable to authorities having jurisdiction. Label shall indicate manufacturer's name; test standard; whether glazing is permitted to be used in doors or openings; if permitted in openings, whether or not glazing has passed the hose-stream test; whether or not glazing meets 450 deg F (250 deg C) temperature-rise limitation; and the fire-resistance rating in minutes.
- G. Thickness: Where glass thickness is indicated, it is a minimum.
 - 1. Minimum Glass Thickness unless noted otherwise: 6 mm.
- H. Strength: Where annealed float glass is indicated, provide annealed float glass, heat-strengthened float glass, or fully tempered float glass as needed to comply with "Performance Requirements" Article. Where heat-strengthened float glass is indicated, provide heat-strengthened float glass or fully tempered float glass.

2.04 GLASS PRODUCTS

- A. Clear Annealed Float Glass: ASTM C 1036, Type I, Class 1 (clear), Quality-Q3.
- B. Tinted Annealed Float Glass: ASTM C 1036, Type I, Class 2 (tinted), Quality-Q3.
- C. Fully Tempered Float Glass: ASTM C 1048, Kind FT (fully tempered), Condition A (uncoated) unless otherwise indicated, Type I, Class 1 (clear) or Class 2 (tinted) as indicated, Quality-Q3.
 - 1. Fabrication Process: By horizontal (roller-hearth) process with roll-wave distortion parallel to bottom edge of glass as installed unless otherwise indicated.
- D. Heat-Strengthened Float Glass: ASTM C 1048, Kind HS (heat strengthened), Type I, Condition A (uncoated) unless otherwise indicated, Type I, Class 1 (clear) or Class 2 (tinted) as indicated, Quality-Q3.
 - 1. Fabrication Process: By horizontal (roller-hearth) process with roll-wave distortion parallel to bottom edge of glass as installed unless otherwise indicated.
- E. Ceramic-Coated Spandrel Glass: ASTM C 1048, Type I, Condition B, Quality-Q3.
- F. Fire-Rated Glazing Products: Provide FireLite NT by Technical Glass Products.
- G. Glazing Film
 - 1. Privacy Glazing Film
 - 2. Application: Locations as indicated on the drawing
 - 3. Tint: Frosted
 - 4. Products: 3M Window Film: www.3m.com | Fasara Glass Finish
 - 5. Adhesive: Permanent, solvent-based polyacrylic, optically clear with silicone coated release paper.
- H. Acid-Etched Frosted Glass: ASTM C 1036, Type II, Form 3, Finish 1, Quality Q3.

2.05 INSULATING GLASS

- A. Insulating-Glass Units: Factory-assembled units consisting of sealed lites of glass separated by a dehydrated interspace, qualified according to ASTM E 2190.
 - 1. Sealing System: Dual seal, with manufacturer's standard primary and secondary sealants.
 - 2. Perimeter Spacer: Nonmetallic laminate.
 - 3. Desiccant: Molecular sieve or silica gel, or a blend of both.
- B. Low-e Coatings:
 - 1. Soft coat (sputter coat), applied to surface 2.
 - 2. Basis of Design: Subject to compliance with requirements, provide Solarban 60 and Solarban 70, or comparable product.

2.06 GLAZING SEALANTS

- A. General:
 - 1. Compatibility: Compatible with one another and with other materials they contact, including glass products, seals of insulating-glass units, and glazing channel substrates, under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.
 - 2. Suitability: Comply with sealant and glass manufacturers' written instructions for selecting glazing sealants suitable for applications indicated and for conditions existing at time of installation.
 - 3. Colors of Exposed Glazing Sealants: As selected by Architect from manufacturer's full range.
- B. Glazing Sealant: Neutral-curing silicone glazing sealant complying with ASTM C 920, Type S, Grade NS, Class 100/50, Use NT.
 - 1. Applications: Exterior windows, storefront and curtainwall.
- C. Glazing Sealant: Neutral-curing silicone glazing sealant complying with ASTM C 920, Type S, Grade NS, Class 50, Use NT.
 - 1. Applications: Interior glazing.

2.07 GLAZING TAPES

- A. Back-Bedding Mastic Glazing Tapes: Preformed, butyl-based, 100 percent solids elastomeric tape; nonstaining and nonmigrating in contact with nonporous surfaces; with or without spacer rod as recommended in writing by tape and glass manufacturers for application indicated; and complying with ASTM C 1281 and AAMA 800 for products indicated below:
 - 1. AAMA 804.3 tape, where indicated.
 - 2. AAMA 806.3 tape, for glazing applications in which tape is subject to continuous pressure.
 - 3. AAMA 807.3 tape, for glazing applications in which tape is not subject to continuous pressure.
- B. Expanded Cellular Glazing Tapes: Closed-cell, PVC foam tapes; factory coated with adhesive on both surfaces; and complying with AAMA 800 for the following types:
- C. AAMA 810.1, Type 1, for glazing applications in which tape acts as the primary sealant.

1. AAMA 810.1, Type 2, for glazing applications in which tape is used in combination with a full bead of liquid sealant.

2.08 MISCELLANEOUS GLAZING MATERIALS

- A. General: Provide products of material, size, and shape complying with referenced glazing standard, with requirements of manufacturers of glass and other glazing materials for application indicated, and with a proven record of compatibility with surfaces contacted in installation.
- B. Cleaners, Primers, and Sealers: Types recommended by sealant or gasket manufacturer.
- C. Setting Blocks: Elastomeric material with a Shore, Type A durometer hardness of 85, plus or minus 5.
- D. Spacers: Elastomeric blocks or continuous extrusions of hardness required by glass manufacturer to maintain glass lites in place for installation indicated.
- E. Edge Blocks: Elastomeric material of hardness needed to limit glass lateral movement (side walking).
- F. Cylindrical Glazing Sealant Backing: ASTM C 1330, Type O (open-cell material), of size and density to control glazing sealant depth and otherwise produce optimum glazing sealant performance.

2.09 FABRICATION OF GLAZING UNITS

- A. Fabricate glazing units in sizes required to fit openings indicated for Project, with edge and face clearances, edge and surface conditions, and bite complying with written instructions of product manufacturer and referenced glazing publications, to comply with system performance requirements.
 1. Allow for thermal movements from ambient and surface temperature changes acting on glass framing members and glazing components.
 - a. Temperature Change: 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.
- B. Clean-cut or flat-grind vertical edges of butt-glazed monolithic lites to produce square edges with slight chamfers at junctions of edges and faces.
- C. Grind smooth and polish exposed glass edges and corners.
- D. Insulated-Glass Units:
 1. Double pane glass units with elastomer edge seal.
 2. Fabricated with both lites heat strengthened glass.
 3. Total thickness of insulating glass units shall be one inch.
 - a. Use 5/8" at doors adjacent to glazed openings.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Examine framing, glazing channels, and stops, with Installer present, for compliance with the following:
 - 1. Manufacturing and installation tolerances, including those for size, squareness, and offsets at corners.
 - 2. Presence and functioning of weep systems.
 - 3. Minimum required face and edge clearances.
 - 4. Effective sealing between joints of glass-framing members.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION

- A. Clean glazing channels and other framing members receiving glass immediately before glazing. Remove coatings not firmly bonded to substrates.
- B. Examine glazing units to locate exterior and interior surfaces. Label or mark units as needed so that exterior and interior surfaces are readily identifiable. Do not use materials that leave visible marks in the completed Work.

3.03 GLAZING, GENERAL

- A. Comply with combined written instructions of manufacturers of glass, sealants, gaskets, and other glazing materials, unless more stringent requirements are indicated, including those in referenced glazing publications.
- B. Protect glass edges from damage during handling and installation. Remove damaged glass from Project site and legally dispose of off Project site. Damaged glass includes glass with edge damage or other imperfections that, when installed, could weaken glass, impair performance, or impair appearance.
- C. Apply primers to joint surfaces where required for adhesion of sealants, as determined by preconstruction testing.
- D. Install setting blocks in sill rabbets, sized and located to comply with referenced glazing publications, unless otherwise required by glass manufacturer. Set blocks in thin course of compatible sealant suitable for heel bead.
- E. Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.
- F. Provide spacers for glass lites where length plus width is larger than 50 inches (1270 mm).
 - 1. Locate spacers directly opposite each other on both inside and outside faces of glass. Install correct size and spacing to preserve required face clearances, unless gaskets and glazing tapes are used that have demonstrated ability to maintain required face clearances and to comply with system performance requirements.

2. Provide 1/8-inch (3-mm) minimum bite of spacers on glass and use thickness equal to sealant width. With glazing tape, use thickness slightly less than final compressed thickness of tape.
- G. Provide edge blocking where indicated or needed to prevent glass lites from moving sideways in glazing channel, as recommended in writing by glass manufacturer and according to requirements in referenced glazing publications.
- H. Set glass lites in each series with uniform pattern, draw, bow, and similar characteristics.
- I. Set glass lites with proper orientation so that coatings face exterior or interior as specified.
- J. Where wedge-shaped gaskets are driven into one side of channel to pressurize sealant or gasket on opposite side, provide adequate anchorage so gasket cannot walk out when installation is subjected to movement.
- K. Square cut wedge-shaped gaskets at corners and install gaskets in a manner recommended by gasket manufacturer to prevent corners from pulling away; seal corner joints and butt joints with sealant recommended by gasket manufacturer.

3.04 TAPE GLAZING

- A. Position tapes on fixed stops so that, when compressed by glass, their exposed edges are flush with or protrude slightly above sightline of stops.
- B. Install tapes continuously, but not necessarily in one continuous length. Do not stretch tapes to make them fit opening.
- C. Cover vertical framing joints by applying tapes to heads and sills first, then to jambs. Cover horizontal framing joints by applying tapes to jambs, then to heads and sills.
- D. Place joints in tapes at corners of opening with adjoining lengths butted together, not lapped. Seal joints in tapes with compatible sealant approved by tape manufacturer.
- E. Do not remove release paper from tape until right before each glazing unit is installed.
- F. Apply heel bead of elastomeric sealant.
- G. Center glass lites in openings on setting blocks, and press firmly against tape by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings.
- H. Apply cap bead of elastomeric sealant over exposed edge of tape.

3.05 GASKET GLAZING (DRY)

- A. Cut compression gaskets to lengths recommended by gasket manufacturer to fit openings exactly, with allowance for stretch during installation.
- B. Insert soft compression gasket between glass and frame or fixed stop so it is securely in place with joints miter cut and bonded together at corners.

- C. Installation with Drive-in Wedge Gaskets: Center glass lites in openings on setting blocks, and press firmly against soft compression gasket by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.
- D. Installation with Pressure-Glazing Stops: Center glass lites in openings on setting blocks, and press firmly against soft compression gasket. Install dense compression gaskets and pressure-glazing stops, applying pressure uniformly to compression gaskets. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.
- E. Install gaskets so they protrude past face of glazing stops.

3.06 SEALANT GLAZING (WET)

- A. Install continuous spacers, or spacers combined with cylindrical sealant backing, between glass lites and glazing stops to maintain glass face clearances and to prevent sealant from extruding into glass channel and blocking weep systems until sealants cure. Secure spacers or spacers and backings in place and in position to control depth of installed sealant relative to edge clearance for optimum sealant performance.
- B. Force sealants into glazing channels to eliminate voids and to ensure complete wetting or bond of sealant to glass and channel surfaces.
- C. Tool exposed surfaces of sealants to provide a substantial wash away from glass.

3.07 CLEANING AND PROTECTION

- A. Immediately after installation remove nonpermanent labels and clean surfaces.
- B. Protect glass from contact with contaminating substances resulting from construction operations. Examine glass surfaces adjacent to or below exterior concrete and other masonry surfaces at frequent intervals during construction, but not less than once a month, for buildup of dirt, scum, alkaline deposits, or stains.
 - 1. If, despite such protection, contaminating substances do come into contact with glass, remove substances immediately as recommended in writing by glass manufacturer. Remove and replace glass that cannot be cleaned without damage to coatings.
- C. Remove and replace glass that is damaged during construction period.
- D. Wash glass on both exposed surfaces not more than four days before date scheduled for inspections that establish date of Substantial Completion. Wash glass as recommended in writing by glass manufacturer.

3.08 GLASS SCHEDULE

- A. **CTG:** Clear tempered glass, meeting requirements of paragraph 2.4.C, minimum, thickness: 6 mm thick.
1. Indoor Lite: Frosted Glass, paragraph 2.4H, Where indicated on drawings.
- B. **CIG-1:** VISION GLASS, (North) Low-E coated, clear insulating glass.
1. Basis of Design Product: Vitro SOLARBAN 70 Clear.
 2. Overall Unit Thickness: 1 inch.
 3. Minimum Thickness of Each Glass Lite: ¼ inch (6mm).
 4. Outdoor Lite: Clear HS (heat-strengthened) float glass, except FT (fully tempered) where required by code for safety glazing.
 5. Tint Color: None.
 6. Interspace Content: Air.
 7. Indoor Lite: Clear HS (heat-strengthened) float glass, except FT (fully tempered) where required by code for safety glazing.
 8. Low-E Coating: Sputtered on second surface.
 9. Winter Nighttime U-Factor: 0.28 maximum.
 10. Summer Daytime U-Factor: 0.26 maximum.
 11. Visible Light Transmittance: 64 percent.
 12. Solar Heat Gain Coefficient: 0.27 maximum.
- C. **CIG-2:** VISION GLASS, (South, West and East) Low-E coated, tinted insulating glass.
1. Basis of Design Product: Vitro SOLARBAN 70, SOLARGRAY.
 2. Overall Unit Thickness: 1 inch.
 3. Minimum Thickness of Each Glass Lite: ¼ inch (6mm).
 4. Outdoor Lite: Tinted HS (heat-strengthened) float glass, except FT (fully tempered) where required by code for safety glazing.
 5. Tint Color: Match Vitro SOLARGRAY.
 6. Interspace Content: Air.
 7. Indoor Lite: Clear HS (heat-strengthened) float glass,, except FT (fully tempered) where required by code for safety glazing.
 8. Low-E Coating: Sputtered on second surface.
 9. Winter Nighttime U-Factor: 0.28 maximum.
 10. Summer Daytime U-Factor: 0.26 maximum.
 11. Visible Light Transmittance: 34 percent.
 12. Solar Heat Gain Coefficient: 0.20 maximum.
- D. **CTIG:** Clear tempered insulating glass, meeting requirements of paragraphs 2.4.C and 2.6.
1. Match CIG-1 and CIG-2. Tempered at locations indicated on the drawings
- E. **SIG:** Spandrel insulating glass, meeting requirements of paragraphs 2.4.B, 2.4.D, 2.4.E and 2.6.
1. Basis of Design Product: Vitro SOLARBAN 70
 2. Overall Unit Thickness: 1 inch.
 3. Minimum Thickness of Each Glass Lite: ¼ inch (6mm).
 4. Outdoor Lite: Clear HS (heat-strengthened) float glass, except FT (fully tempered) where required by code for safety glazing.
 5. Tint Color: None.
 6. Interspace Content: Air.

7. Indoor Lite: Clear HS (heat-strengthened) float glass except FT (fully tempered) where required by code for safety glazing.
 8. Low-E Coating: Sputtered on second surface.
 9. Opaque Coating: Fourth Surface | Solid Opacicoat 300, color #3-820 gray
 10. Winter Nighttime U-Factor: 0.28 maximum.
 11. Summer Daytime U-Factor: 0.26 maximum.
- F. **FRPG:** Fire-rated glass, meeting requirements of paragraph 2.4.F, located at fire rated locations indicated on drawings.
- G. **LG:** Laminated Glazing
1. Outer Glass Ply: 1/8" clear annealed float glass.
 2. Inner Glass Ply: 1/8" clear annealed float glass.
 3. Security Interlayer: 0.090" high-stiffness ionoplast polymer interlayer (SentryGlas / SGP) or manufacturer-certified high-adhesion structural security PVB.

END OF SECTION

SECTION 092116 - GYPSUM BOARD ASSEMBLIES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Metal stud ceiling framing.
- B. Metal channel ceiling framing.
- C. Cementitious backing board.
- D. Gypsum wallboard.
- E. Joint treatment and accessories.
- F. Textured finish system.

1.02 RELATED REQUIREMENTS

- A. Section 072100 - Thermal Insulation: Acoustic insulation.
- B. Section 072500 - Weather Barriers: Water-resistive barrier over sheathing.
- C. Section 092216 - Non-Structural Metal Framing.

1.03 REFERENCE STANDARDS

- A. AISI S220 - North American Standard for Cold-Formed Steel Nonstructural Framing; 2020.
- B. AISI S240 - North American Standard for Cold-Formed Steel Structural Framing; 2015, with Errata (2020).
- C. ANSI A108.11 - American National Standard Specifications for Interior Installation of Cementitious Backer Units; 2023.
- D. ANSI A118.9 - American National Standard Specifications for Test Methods and Specifications for Cementitious Backer Units; 2023.
- E. ASTM A1003/A1003M - Standard Specification for Steel Sheet, Carbon, Metallic- and Nonmetallic-Coated for Cold-Formed Framing Members; 2015.
- F. ASTM C1007 - Standard Specification for Installation of Load Bearing (Transverse and Axial) Steel Studs and Related Accessories; 2020 (Reapproved 2024).
- G. ASTM C475/C475M - Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board; 2017 (Reapproved 2022).
- H. ASTM C754 - Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products; 2020.
- I. ASTM C840 - Standard Specification for Application and Finishing of Gypsum Board; 2024.

- J. ASTM C954 - Standard Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs from 0.033 in. (0.84 mm) to 0.112 in. (2.84 mm) in Thickness; 2022.
- K. ASTM C1002 - Standard Specification for Steel Self-Piercing Tapping Screws for Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs; 2022.
- L. ASTM C1047 - Standard Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base; 2019.
- M. ASTM C1325 - Standard Specification for Fiber-Mat Reinforced Cementitious Backer Units; 2022, with Editorial Revision (2023).
- N. ASTM C1396/C1396M - Standard Specification for Gypsum Board; 2024.
- O. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2024.
- P. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements; 2023.
- Q. ASTM E413 - Classification for Rating Sound Insulation; 2022.
- R. GA-216 - Application and Finishing of Gypsum Panel Products; 2024.
- S. UL 2079 - Standard for Tests for Fire Resistance of Building Joint Systems; Current Edition, Including All Revisions.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Coordination: Coordinate the installation of gypsum board assemblies with size, location, and installation of service utilities.
- B. Preinstallation Meeting: Conduct a preinstallation meeting one week prior to the start of the work of this section; require attendance by all affected installers.

1.05 SUBMITTALS

- A. See Section 013000 - Administrative Requirements for submittal procedures.
- B. Product Data:
 - 1. Provide data on metal framing, gypsum board, accessories, and joint finishing system.

1.06 Delivery, Storage, and Handling

- A. Store gypsum products and accessories indoors and keep above freezing. Elevate boards above floor, on nonwicking supports, in accordance with manufacturer's recommendations.
- B. Store metal products to prevent corrosion.

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.
 - 1. Structural Grade: As required to meet design criteria.
 - 2. Corrosion Protection Coating Designation: G60, or equivalent in accordance with AISI S220.
- B. Manufacturers - Metal Framing, Connectors, and Accessories:
 - 1. CEMCO: www.cemcosteel.com/#sle.
 - 2. ClarkDietrich: www.clarkdietrich.com/#sle.
 - 3. Jaimes Industries: www.jaimesind.com/#sle.
 - 4. R-stud: www.rstud.com/#sle.
 - 5. SCAFCO Corporation: www.scafco.com/#sle.
 - 6. Steel Construction Systems: www.steelconsystems.com/#sle.
 - 7. Telling Industries: www.tellingindustries.com/#sle.
 - 8. Substitutions: See Section 016000 - Product Requirements.
- C. Nonstructural Steel Framing for Application of Gypsum Board: See Section 092216.
- D. Nonstructural Framing System Components: AISI S220; galvanized sheet steel, of size and properties necessary to comply with ASTM C754 for the spacing indicated, with maximum deflection of wall framing of L/240 at 5 psf (L/240 at 240 Pa).
 - 1. Studs: C-shaped with knurled or embossed faces.
 - 2. Runners: U shaped, sized to match studs.
 - 3. Ceiling Channels: C-shaped.
- E. Partition Head To Structure Connections: Provide track fastened to structure with legs of sufficient length to accommodate deflection, for friction fit of studs cut short and fastened as indicated on drawings.
- F. Deflection and Firestop Track: Intumescent strip factory-applied to track flanges expands when exposed to heat or flames to provide a perimeter joint seal.
- G. Preformed Top Track Firestop Seal:
 - 1. Provide components UL-listed for use in UL-listed fire-resistance-rated head of partition joint systems indicated on drawings.
- H. Preformed Top of Wall Firestop Gasket:
 - 1. Provide components UL-listed for use in UL-listed fire-resistance-rated head of partition joint systems indicated on drawings.
- I. Non-structural Framing Accessories:
 - 1. Ceiling Hangers: Type and size as specified in ASTM C754 for spacing required.
 - 2. Partial Height Wall Framing Support: Provides stud reinforcement and anchored connection to floor.
- J. Grid Suspension Systems: Steel grid system of main tees and support bars connected to structure using hanging wire.

1. Products:
 - a. CertainTeed Corporation: www.certainteed.com/ceilings-and-walls/#sle.
 - b. USG Corporation; Drywall Suspension System: www.usg.com/#sle.
 - c. Substitutions: See Section 016000 - Product Requirements.

2.02 BOARD MATERIALS

- A. Manufacturers - Gypsum-Based Board:
 1. American Gypsum Company: www.americangypsum.com/#sle.
 2. CertainTeed Corporation: www.certainteed.com/#sle.
 3. Georgia-Pacific Gypsum: www.gpgypsum.com/#sle.
 4. Gold Bond Building Products, LLC provided by National Gypsum Company: www.goldbondbuilding.com/#sle.
 5. PABCO Gypsum: www.pabco gypsum.com/#sle.
 6. USG Corporation: www.usg.com/#sle.
 7. Substitutions: See Section 016000 - Product Requirements.
- B. Gypsum Wallboard: Paper-faced gypsum panels as defined in ASTM C1396/C1396M; sizes to minimize joints in place; ends square cut.
 1. Application: Use for vertical surfaces and ceilings, unless otherwise indicated.
 2. Thickness:
 - a. Vertical Surfaces: 5/8 inch (16 mm).
 - b. Ceilings: 5/8 inch (16 mm).
 3. Mold-Resistant, Paper-Faced Products:
 - a. American Gypsum Company; M-Bloc Type X: www.americangypsum.com/#sle.
 - b. CertainTeed Corporation; M2Tech 5/8" Type X Moisture & Mold Resistant Drywall: www.certainteed.com/#sle.
 - c. Georgia-Pacific Gypsum; ToughRock Fireguard X Mold-Guard: www.gpgypsum.com/#sle.
 - d. USG Corporation; Sheetrock Brand EcoSmart Panels Mold Tough Firecode X 5/8 in. (15.9 mm): www.usg.com/#sle.
 - e. USG Corporation; Sheetrock Brand Mold Tough Firecode SCX Panels 5/8 in. (15.9 mm): www.usg.com/#sle.
 - f. Substitutions: See Section 016000 - Product Requirements.
- C. Backing Board For Wet Areas: One of the following products:
 1. Application: Surfaces behind tile in wet areas, including manufactured housing, tub and shower surrounds, and shower ceilings.
 2. ANSI Cement-Based Board: Non-gypsum-based; aggregated Portland cement panels with glass fiber mesh embedded in front and back surfaces complying with ANSI A118.9 or ASTM C1325.
 - a. Thickness: 5/8 inch (16 mm).

2.03 GYPSUM BOARD ACCESSORIES

- A. Fire and Sound Attenuating Insulation: Sprayed cellulose fire-rated material for cavities in wall assemblies.
 1. Surface Burning Characteristics: Provide assemblies with Class I rating, when tested in accordance with ASTM E84.

2. Sound Transmission Class (STC): 56, calculated in accordance with ASTM E413, based on tests conducted in accordance with ASTM E90.
- B. Acoustic Insulation: See Section 072100.
- C. Acoustic Sealant: Acrylic emulsion latex or water-based elastomeric sealant; do not use solvent-based non-curing butyl sealant.
- D. Finishing Accessories: ASTM C1047, extruded aluminum alloy (6063 T5) or galvanized steel sheet ASTM A924/A924M G90, unless noted otherwise.
 1. Types: As detailed or required for finished appearance.
- E. Interior Trim: ASTM C 1047.
 1. Material: Galvanized or aluminum-coated steel sheet or rolled zinc.
 2. Shapes:
 - a. Cornerbead.
 - b. LC-Bead: J-shaped; exposed long flange receives joint compound.
 - c. L-Bead: L-shaped; exposed long flange receives joint compound.
 - d. Expansion (control) joint – 093 by Clark Dietrich or equal
 - e. Resilient Channel; Z shaped
 - f. Round Collar: Z-shape formed to fit the round columns with a reveal at the column face
 - g. Drywall Reveal Molding – Fry Reglet Reveal
- F. Exterior Trim: ASTM C 1047.
 1. Material: Hot-dip galvanized steel sheet, or rolled zinc.
 2. Shapes:
 - a. LC-Bead: J-shaped; exposed long flange receives joint compound.
- G. Beads, Joint Accessories, and Other Trim: ASTM C1047, rigid plastic, galvanized steel, or rolled zinc, unless noted otherwise.
 1. Corner Beads: Low profile, for 90 degree outside corners.
 2. Expansion Joints:
 - a. Fire-Resistance Rated: 2 hours when joint system tested in accordance with UL 2079.
 - b. Type: V-shaped PVC with tear away fins.
- H. Joint Materials: ASTM C475/C475M and as recommended by gypsum board manufacturer for project conditions.
- I. Finishing Compound: Surface coat and primer, takes the place of skim coating.
- J. Screws for Fastening of Gypsum Panel Products to Cold-Formed Steel Studs Less than 0.033 inches (0.84 mm) in Thickness and Wood Members: ASTM C1002; self-piercing tapping screws, corrosion-resistant.
- K. Screws for Fastening of Gypsum Panel Products to Steel Members from 0.033 to 0.112 inch (0.84 to 2.84 mm) in Thickness: ASTM C954; steel drill screws, corrosion-resistant.
- L. MTA-05: Metal Trim Accessory – Fry Reglet – Drywal Reveal Molding – Paint to Match Wall Finish.
- M. MTA-06: Metal Trim Accessory – Kofflersales – Colored Metal End Wall Guards – Satin Black – $\frac{3}{4}$ "x $\frac{3}{4}$ "xHeight of Hold Opening.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that project conditions are appropriate for work of this section to commence.

3.02 FRAMING INSTALLATION

- A. Metal Framing: Install in accordance with ASTM C1007/AISI S220 and manufacturer's instructions.
- B. Suspended Ceilings and Soffits: Space framing and furring members as indicated.
 - 1. Level ceiling system to a tolerance of 1/1200.
 - 2. Laterally brace entire suspension system.
- C. Studs: Space studs at 16 inches on center (at 406 mm on center).
 - 1. Extend partition framing to structure where indicated and to ceiling in other locations.
 - 2. Partitions Terminating at Ceiling: Attach ceiling runner securely to ceiling track in accordance with manufacturer's instructions.
 - 3. Partitions Terminating at Structure: Attach extended leg top runner to structure, maintain clearance between top of studs and structure, and brace both flanges of studs with continuous bridging.
- D. Blocking: Install mechanically fastened steel channel blocking for support of:
 - 1. Wall-mounted cabinets.
 - 2. Plumbing fixtures.
 - 3. Toilet partitions.
 - 4. Toilet accessories.

3.03 ACOUSTIC ACCESSORIES INSTALLATION

- A. Acoustic Insulation: Place tightly within spaces, around cut openings, behind and around electrical and mechanical items within partitions, and tight to items passing through partitions.
- B. Sound Isolation Tape: Apply to vertical studs and top and bottom tracks/runners in accordance with manufacturer's instructions.
- C. Acoustic Sealant: Install in accordance with manufacturer's instructions.

3.04 BOARD INSTALLATION

- A. Comply with ASTM C840, GA-216, and manufacturer's instructions. Install to minimize butt end joints, especially in highly visible locations.
- B. Single-Layer Nonrated: Install gypsum board in most economical direction, with ends and edges occurring over firm bearing.
- C. Fire-Resistance-Rated Construction: Install gypsum board in strict compliance with requirements of assembly listing.

- D. Exposed Gypsum Board in Interior Wet Areas: Seal joints, cut edges, and holes with water-resistant sealant.
- E. Cementitious Backing Board: Install over steel framing members and plywood substrate where indicated, in accordance with ANSI A108.11 and manufacturer's instructions.
- F. Installation on Metal Framing: Use screws for attachment of gypsum board except face layer of nonrated double-layer assemblies, which may be installed by means of adhesive lamination.

3.05 INSTALLATION OF TRIM AND ACCESSORIES

- A. Control Joints: Place control joints consistent with lines of building spaces and as indicated.
 - 1. Not more than 30 feet (10 meters) apart on walls and ceilings over 50 feet (16 meters) long.
- B. Corner Beads: Install at external corners, using longest practical lengths.
- C. Edge Trim: Install at locations where gypsum board abuts dissimilar materials.
- D. Moisture Guard Trim: Install on bottom edge of gypsum board throughout building.

3.06 JOINT TREATMENT

- A. Paper Faced Gypsum Board: Use paper joint tape, embed with drying type joint compound and finish with drying type joint compound.
- B. Finish gypsum board in accordance with levels defined in ASTM C840, as follows:
 - 1. Level 5: Walls and ceilings to receive semi-gloss or gloss paint finish and other areas specifically indicated.
 - 2. Level 4: Walls and ceilings to receive paint finish or wall coverings, unless otherwise indicated.
 - 3. Level 2: In utility areas, behind cabinetry, and on backing board to receive tile finish.
 - 4. Level 1: Fire-resistance-rated wall areas above finished ceilings, whether or not accessible in the completed construction.
- C. Tape, fill, and sand exposed joints, edges, and corners to produce smooth surface ready to receive finishes.
 - 1. Feather coats of joint compound so that camber is maximum 1/32 inch (0.8 mm).
- D. Where Level 5 finish is indicated, spray apply high build drywall surfacer over entire surface after joints have been properly treated; achieve a flat and tool mark-free finish.

3.07 TEXTURE FINISH

- A. Apply finish texture coating by means of spraying apparatus in accordance with manufacturer's instructions and to match approved sample.

3.08 TOLERANCES

- A. Maximum Variation of Finished Gypsum Board Surface from True Flatness: 1/8 inch in 10 feet (3 mm in 3 m) in any direction.

3.09 Cleaning

- A. See Section 017000 - Execution and Closeout Requirements for additional requirements.

3.10 Protection

- A. Protect installed gypsum board assemblies from subsequent construction operations.

END OF SECTION

SECTION 092216 - NON-STRUCTURAL METAL FRAMING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Metal partition, ceiling, and soffit framing.
- B. Framing accessories.

1.02 RELATED REQUIREMENTS

- A. Section 054000 - Cold-Formed Metal Framing: Requirements for structural, load-bearing, metal stud framing and exterior wall stud framing.
- B. Section 055000 - Metal Fabrications: Execution requirements for anchors for attaching work of this section.
- C. Section 078400 - Firestopping: Sealing top-of-wall assemblies at fire-resistance-rated walls.
- D. Section 079200 - Joint Sealants: Sealing acoustical gaps in construction other than gypsum board or plaster work.
- E. Section 085113 - Aluminum Windows: Product requirements for window anchors.
- F. Section 092116 - Gypsum Board Assemblies: Metal studs for gypsum board partition framing.
- G. Section 092116 - Gypsum Board Assemblies: Execution requirements for anchors for attaching work of this section.

1.03 REFERENCE STANDARDS

- A. AISI S220 - North American Standard for Cold-Formed Steel Nonstructural Framing; 2020.
- B. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2025.
- C. ASTM C1007 - Standard Specification for Installation of Load Bearing (Transverse and Axial) Steel Studs and Related Accessories; 2020 (Reapproved 2024).
- D. ASTM C665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing; 2024.
- E. ASTM C754 - Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products; 2020.
- F. ASTM C1002 - Standard Specification for Steel Self-Piercing Tapping Screws for Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs; 2022.
- G. GA-600 - Fire Resistance and Sound Control Design Manual; 2024.

1.04 SUBMITTALS

- A. See Section 013000 - Administrative Requirements for submittal procedures.
- B. Shop Drawings:
 - 1. Indicate prefabricated work, component details, stud layout, framed openings, anchorage to structure, acoustic details, type and location of fasteners, accessories, and items of other related work.
 - 2. Describe method for securing studs to tracks, splicing, and for blocking and reinforcement of framing connections.
- C. Product Data: Provide data describing framing member materials and finish, product criteria, load charts, and limitations.
- D. Manufacturer's qualification statement.

1.05 QUALITY ASSURANCE

- A. Installer Qualifications: Company specializing in performing the work of this section with minimum three years documented experience and approved by manufacturer.
- B. Manufacturer Qualifications:
 - 1. Company specializing in manufacturing the types of products specified in this section, and with minimum 3 years of documented experience.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Metal Framing, Connectors, and Accessories:
 - 1. CEMCO; ____: www.cemcosteel.com/#sle.
 - 2. ClarkDietrich; ____: www.clarkdietrich.com/#sle.
 - 3. Jaimes Industries; ____: www.jaimesind.com/#sle.
 - 4. R-stud; ____: www.rstud.com/#sle.
 - 5. SCAFCO Corporation; ____: www.scafco.com/#sle.
 - 6. Simpson Strong Tie; ____: www.strongtie.com/#sle.
 - 7. Steel Construction Systems; ____: www.steelconsystems.com/#sle.
 - 8. Super Stud Building Products, Inc; ____: www.buysuperstud.com/#sle.
 - 9. The Steel Network, Inc; ____: www.SteelNetwork.com/#sle.
 - 10. Substitutions: See Section 016000 - Product Requirements.

2.02 FRAMING MATERIALS

- A. Fire-Resistance-Rated Assemblies: Comply with applicable code and as indicated on drawings.
- B. Firestopping: Materials meeting requirements necessary to maintain rating of penetrated assembly.
 - 1. See Section 078400.

- C. Non-Loadbearing Framing System Components: AISI S220; sheet steel, of size and properties necessary for the spacing indicated, with maximum deflection of wall framing of L/240 at 5 psf (L/240 at 240 Pa).
1. Studs: C-shaped with flat faces.
 - a. Products:
 - 1) CEMCO; CT Studs: www.cemcosteel.com/#sle.
 - 2) ClarkDietrich; ProSTUD: www.clarkdietrich.com/#sle.
 - 3) MRI Steel Framing; MRI Traditional - Non-Structural: www.mristeel framing.com/#sle.
 - 4) R-stud; R-stud: www.rstud.com/#sle.
 - 5) Super Stud Building Products, Inc; The EDGE: www.buysuperstud.com/#sle.
 - 6) Substitutions: See Section 016000 - Product Requirements.
 2. Runners: U-shaped, sized to match studs.
 - a. Products:
 - 1) Ironline Metals; Bantam Track: www.ironlinemetals.com/#sle.
 - 2) MRI Steel Framing; MRI Smart EQ Track: www.mristeel framing.com/#sle.
 3. Ceiling Channels: U-shaped.
 - a. Products:
 - 1) MRI Steel Framing; MRI U-Channel: www.mristeel framing.com/#sle.
 - 2) Substitutions: See Section 016000 - Product Requirements.
- D. Partition Head to Structure Connections: Provide track fastened to structure with legs of sufficient length to accommodate deflection, for friction fit of studs cut short and braced with continuous bridging on both sides.
- E. Deflection and Firestop Track: Intumescent strip factory-applied to track flanges expands when exposed to heat or flames to provide a perimeter joint seal.
- F. Preformed Top Track Firestop Seal:
- G. Non-Loadbearing Framing Accessories:
1. Ceiling Hangers: Type and size as specified in ASTM C754 for spacing required.
 2. Partial Height Wall Framing Support: Provides stud reinforcement and anchored connection to floor.
 3. Bracing and Bridging: ASTM A653/A653M G90 (Z275) galvanized steel; for lateral bracing of wall studs with slots for engaging on-module studs.
 4. Framing Connectors: ASTM A653/A653M steel clips; secures cold rolled channel to wall studs for lateral bracing.
 5. Sheet Metal Backing: 25 gauge, 0.0209 inch (0.53 mm) thick.
 6. Fasteners: ASTM C1002 self-piercing self-tapping screws.
 7. Anchorage Devices: Powder actuated.
 8. Acoustic Insulation: ASTM C665; preformed mineral-fiber, friction fit type, unfaced; thickness as required for STC.

PART 3 EXECUTION

3.01 INSTALLATION OF STUD FRAMING

- A. Install non-structural members in accordance with ASTM C754.
- B. Extend partition framing to structure where indicated and to ceiling in other locations.
- C. Partitions Terminating at Ceiling: Attach ceiling runner securely to ceiling track in accordance with manufacturer's instructions.
- D. Partitions Terminating at Structure: Attach extended leg top runner to structure, maintain clearance between top of studs and structure, and brace both flanges of studs as indicated.
- E. Partitions Terminating at Structure: Attach top runner to structure, maintain clearance between top of studs and structure, and connect studs to track using specified mechanical devices in accordance with manufacturer's instructions; verify free movement of top of stud connections; do not leave studs unattached to track.
- F. Fire-Resistance-Rated Construction: Install framing and accessories in accordance with requirements of fire-resistance-rated assembly and to GA-600 requirements.
- G. Align and secure top and bottom runners at 24 inches (600 mm) on center.
- H. At partitions indicated with an acoustic rating:
 - 1. Place one bead of acoustic sealant between runners and substrate , studs and adjacent construction.
 - 2. Place one bead of acoustic sealant between studs and adjacent vertical surfaces.
- I. Fit runners under and above openings; secure intermediate studs to same spacing as wall studs.
- J. Install studs vertically at 16 inches (400 mm) on center.
- K. Align stud web openings horizontally.
- L. Secure studs to tracks using crimping method. Do not weld.
- M. Stud splicing is not permissible.
- N. Fabricate corners using a minimum of three studs.
- O. Install double studs at wall openings, door and window jambs, not more than 2 inches (50 mm) from each side of openings.
- P. Brace stud framing system rigid.
- Q. Coordinate erection of studs with requirements of door frames; install supports and attachments.
- R. Coordinate installation of bucks, anchors, and blocking with electrical, mechanical, and other work to be placed within or behind stud framing.
- S. Blocking: Use steel channels secured to studs. Provide blocking for support of plumbing fixtures, toilet partitions, wall cabinets, toilet accessories, hardware, and opening frames.

3.02 CEILING AND SOFFIT FRAMING

- A. Install furring after work above ceiling or soffit is complete. Coordinate the location of hangers with other work.
- B. Install furring independent of walls, columns, and above-ceiling work.
- C. Securely anchor hangers to structural members or embed them in structural slab. Space hangers as required to limit deflection to criteria indicated. Use rigid hangers at exterior soffits.
- D. Space main carrying channels at maximum 72 inches (1 800 mm) on center, and not more than 6 inches (150 mm) from wall surfaces. Lap splice securely.
- E. Securely fix carrying channels to hangers to prevent turning or twisting and to transmit full load to hangers.
- F. Place furring channels perpendicular to carrying channels, not more than 2 inches (50 mm) from perimeter walls, and rigidly secure. Lap splices securely.
- G. Reinforce openings in suspension system that interrupt main carrying channels or furring channels with lateral channel bracing. Extend bracing minimum 24 inches (600 mm) past each opening.
- H. Laterally brace suspension system.

3.03 TOLERANCES

- A. Maximum Variation From True Position: 1/8 inch in 10 feet (3 mm in 3 m).
- B. Maximum Variation From Plumb: 1/8 inch in 10 feet (3 mm in 3 m).

END OF SECTION

SECTION 093000 - TILING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Tile for wall applications.
- B. Cementitious backer board as tile substrate.

1.02 RELATED REQUIREMENTS

1.03 REFERENCE STANDARDS

- A. ANSI A108/A118/A136 - American National Standard Specifications for the Installation of Ceramic Tile (Compendium); 2024.
- B. ANSI A108.11 - American National Standard Specifications for Interior Installation of Cementitious Backer Units; 2023.
- C. ANSI A118.9 - American National Standard Specifications for Test Methods and Specifications for Cementitious Backer Units; 2023.
- D. ANSI A118.12 - American National Standard Specifications for Crack Isolation Membranes for Thin-Set Ceramic Tile and Dimension Stone Installation; 2014 (Reaffirmed 2024).
- E. ANSI A137.1 - American National Standard Specifications for Ceramic Tile; 2022.
- F. ANSI A326.3 - American National Standard Test Method for Measuring Dynamic Coefficient of Friction of Hard Surface Flooring Materials; 2021.
- G. TCNA (HB) - Handbook for Ceramic, Glass, and Stone Tile Installation; 2025.
- H. TCNA (HB-GP) - Handbook for Gauged Porcelain Tiles and Gauged Porcelain Tile Panels/Slabs Installation; 2023.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Preinstallation Meeting: Convene a preinstallation meeting one week before starting work of this section; require attendance by affected installers.

1.05 SUBMITTALS

- A. See Section 013000 - 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. Samples: Mount tile and apply grout on two plywood panels, minimum 18 by 18 inches (457 by 457 mm) in size illustrating pattern, color variations, and grout joint size variations.

- D. Installer's qualification statement.
- E. Maintenance Data: Include recommended cleaning methods, cleaning materials, and stain removal methods.
- F. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
 - 1. See Section 016000 - Product Requirements, for additional provisions.
 - 2. Extra Tile: 1 percent of each size, color, and surface finish combination, but not less than 1% of each type.

1.06 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:
 - 1. Company specializing in performing tile installation, with minimum of five years of documented experience.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. See Section 017419 - Construction Waste Management and Disposal for packaging waste requirements.
- B. Protect adhesives from freezing or overheating in accordance with manufacturer's instructions.

1.08 FIELD CONDITIONS

- A. Do not install solvent-based products in an unventilated environment.
- B. Maintain ambient and substrate temperature above 50 degrees F (10 degrees C) and below 100 degrees F (38 degrees C) during installation and curing of setting materials.

PART 2 PRODUCTS

2.01 Basis of Design: Crossville

- A. Tile type (TL-01) – Crossville – Calce – Grigio – 39.37"x118.11"
- B. Tile type (TL-02) – Crossville - Calce – Antracite – 39.37"x118.11"
- C. Tile type (TL-03) – Crossville - Calce – Nero – 39.37"x118.11"
- D. Tile type (TL-04) – Crossville – Colors in Bloom – Artic – 6"x24"
- E. Tile type (TL-05) – Nemo Tile + Stone – Metro – Mixture of Lilac Glossy, Raven Glossy, Black Glossy, Black Matte – 2"x8"
- F. Tile type (TL-06) – Concept Surfaces – Malt Greige Range – 12"X24"
- G. Acceptable Alternates:
 - 1. Daltile
 - 2. Ergon

H. Setting Materials:

1. ARDEX Engineered Cements: www.ardexamericas.com/#sle.
2. Bostik Inc: www.bostik.com/#sle.
3. Custom Building Products: www.custombuildingproducts.com/#sle.
4. TEC Specialty Products LLC: www.tecspecialty.com/#sle.
5. LATICRETE International, Inc: www.laticrete.com/#sle.
6. Mapei Corporation: www.mapei.com/#sle.
7. Merkrete, by Parex USA, Inc: www.merkrete.com/#sle.
8. Schluter-Systems: www.schluter.com/#sle.
9. Source Limitations: Furnish products produced by single manufacturer and obtained from single supplier.

I. Grout:

1. G-01: Mapei: Epoxy Grout: 5093 Warm Gray
2. G-02: Mapei: Epoxy Grout: 5107 Iron
3. G-03: Mapei: Epoxy Grout: 5010 Black
4. G-04: Mapei: Epoxy Grout: 5227 Castle Wall
5. G-05: Mapei: Epoxy Grout: 5010 Black
6. G-06: Mapei: Epoxy Grout: 5107 Iron
7. Manufacturer:
 - a. ARDEX Engineered Cements: www.ardexamericas.com/#sle.
 - b. Bostik Inc: www.bostik.com/#sle.
 - c. Custom Building Products: www.custombuildingproducts.com/#sle.
 - d. TEC Specialty Products LLC: www.tecspecialty.com/#sle.
 - e. LATICRETE International, Inc: www.laticrete.com/#sle.
 - f. Litokol USA: www.tiledoctor.com/#sle.
 - g. Mapei Corporation: www.mapei.com/#sle.
 - h. Merkrete, by Parex USA, Inc: www.merkrete.com/#sle.
 - i. Source Limitations: Furnish products produced by single manufacturer and obtained from single supplier.

2.02 Performance Requirements

- A. Floor Tile: Provide tile for flooring applications with minimum wet Dynamic Coefficient of Friction (DCOF) of 0.42 when tested in accordance with ANSI A326.3.

2.03 SETTING MATERIALS

A. Available Manufacturers:

1. Atlas Minerals & Chemicals, Inc.
2. Bonsal, W. R., Company.
3. Custom Building Products.
4. LATICRETE International Inc.
5. MAPEI Corporation.
6. Summitville Tiles, Inc.

- B. Latex-Portland Cement Mortar (Thin Set): ANSI A118.4, consisting of the following:

1. Prepackaged dry-mortar mix containing dry, redispersible, ethylene vinyl acetate additive to which only water must be added at Project site.
- C. Organic Adhesive: ANSI A136.1, Type I, with a VOC content of 65 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Bonsal American; an Oldcastle company.
 - b. Bostik, Inc.
 - c. C-Cure.
 - d. Custom Building Products.
 - e. DAP Inc.
 - f. Jamo Inc.
 - g. Laticrete International, Inc.
 - h. MAPEI Corporation.
 - i. Southern Grouts & Mortars, Inc.
 - j. Summitville Tiles, Inc.
 - k. TEC; a subsidiary of H. B. Fuller Company.

2.04 Maintenance Materials

- A. Tile Sealant: Gunnable, silicone, siliconized acrylic, modified silane polymer, or urethane sealant; moisture- and mildew-resistant type.
1. Applications: Between tile and plumbing fixtures.
 2. Color: As selected by Architect from manufacturer's full line.
 3. Products:
 - a. ARDEX Engineered Cements; ARDEX SX: www.ardexamericas.com/#sle.
 - b. Custom Building Products; Commercial 100% Silicone Caulk: www.custombuildingproducts.com/#sle.
 - c. LATICRETE International, Inc; LATICRETE LATASIL: www.laticrete.com/#sle.
 - d. Mapei Corporation; Mapesil T Plus: www.mapei.com/#sle.
 - e. Proflex Products, Inc; Hydra-Weld: www.proflex.us/#sle.
 - f. Rust-Oleum Corporation: www.rustoleum.com/#sle.
 - g. Substitutions: See Section 016000 - Product Requirements.
- B. Grout Sealer: Liquid-applied, moisture and stain protection for existing or new Portland cement grout.
1. Composition: Water-based colorless silicone.
 2. Color: As selected by Architect from manufacturer's full line.
 3. Products:
 - a. STONETECH, a Division of LATICRETE International, Inc; STONETECH Heavy Duty Grout Sealer: www.laticrete.com/#sle.
 - b. Merkrete, by Parex USA, Inc; Merkrete Revive: www.merkrete.com/#sle.
 - c. Substitutions: See Section 016000 - Product Requirements.
- C. Tile Sealer: Stain protection for ceramic tile and natural stone tile.
1. Products:

- a. Custom Building Products; Aqua Mix Enrich 'N' Seal: www.custombuildingproducts.com/#sle.
- b. Rust-Oleum Corporation; Miracle Sealants 511 H2O Plus: www.rustoleum.com/#sle.
- c. STONETECH, a division of LATICRETE International, Inc; STONETECH BulletProof Sealer: www.laticrete.com/#sle.
- d. Substitutions: See Section 016000 - Product Requirements.

2.05 ACCESSORY MATERIALS

- A. Concrete Floor Slab Crack Isolation Membrane: Material complying with ANSI A118.12; not intended as waterproofing.
 - 1. Crack Resistance: No failure at 1/8 inch (3.2 mm) gap, minimum.
- B. Fluid-Applied Membrane: Liquid-latex rubber or elastomeric polymer.
 - 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. Boiardi Products; a QEP company; Elastiment 644 Membrane Waterproofing System.
 - b. Bonsal American; an Oldcastle company; B 6000 Waterproof Membrane.
 - c. Bostik, Inc.; Durabond D-222 Duraguard Membrane.
 - d. C-Cure; Pro-Red Waterproofing Membrane 63.
 - e. Custom Building Products; Redgard Waterproofing and Crack Prevention Membrane.
 - f. Jamo Inc.; Waterproof.
 - g. Laticrete International, Inc.; Laticrete Watertight Floor N' Wall Waterproofing.
 - h. MAPEI Corporation; Mapelastic HPG.
 - i. Southern Grouts & Mortars, Inc.; Southcrete 1100 Crack Suppression and Waterproofing.
 - j. TEC; a subsidiary of H. B. Fuller Company; HydraFlex - Waterproofing Crack Isolation Membrane.
- C. Metal Trim Accessory
 - 1. MTA-01 – Schluter – Jolly – Dark Graphite Anodized
 - 2. MTA-02 – Schluter – Jolly – Clear Anodized
 - 3. MTA-03 – Koffler Sales Company – Aluminum Corner Guard – Satin Black – $\frac{3}{4}$ " x $\frac{3}{4}$ " x Height of Tile
 - 4. MTA-04 – Koffler Sales Company – Aluminum Corner Guard – Satin Silver

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify subfloor surfaces are smooth and flat within tolerances specified for that type of work and are ready to receive tile.
- B. Verify wall surfaces are smooth and flat within tolerances specified for that type of work, are dust-free, and are ready to receive tile.

3.02 Preparation

- A. Protection of In-Place Conditions.
- B. Vacuum clean surfaces and damp clean.
- C. Seal substrate surface cracks with filler.
- D. Install cementitious 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 feather edge.

3.03 INSTALLATION - GENERAL

- A. Install tile, thresholds, and stair treads and grout in accordance with applicable requirements of ANSI A108/A118/A136, manufacturer's instructions, and TCNA (HB) or TCNA (HB-GP) recommendations, as applicable.
- B. Lay tile to pattern indicated on drawings. Do not interrupt tile pattern through openings.
- C. Cut and fit tile to penetrations through tile, leaving sealant joint space. Form corners and bases neatly. Align floor joints.
- D. Place tile joints uniform in width, subject to variance in tolerance allowed in tile size. Make grout joints without voids, cracks, excess mortar or excess grout, or too little grout.
- E. Form internal angles square and external angles bullnosed.
- F. Sound tile after setting. Replace hollow sounding units.
- G. Keep control and expansion joints free of mortar, grout, and adhesive.
- H. Prior to grouting, allow installation to completely cure; minimum of 48 hours.
- I. Grout tile joints unless otherwise indicated on drawings. Use standard grout unless otherwise indicated on drawings.
- 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 - WALL TILE

- A. Tile Installation: Interior wall installation over gypsum board; organic adhesive; ANSI A136.1.
 - 1. Organic adhesive.
 - 2. Grout: Polymer-modified sanded grout.
- B. Tile Installation: Interior wall installation over stable masonry or concrete; thin-set mortar; TCA W244 and ANSI A108.5.
 - 1. Thin-Set Mortar: Latex- portland cement mortar.
 - 2. Grout: Polymer-modified sanded grout.

3.05 PROTECTION

- A. Do not permit traffic over finished floor surface for 4 days after installation.

END OF SECTION

SECTION 095100 - ACOUSTICAL CEILINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Suspended metal grid ceiling system.
- B. Acoustical units.

1.02 REFERENCE STANDARDS

- A. ASTM A666/A666M - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2024.
- B. ASTM C635/C635M - Standard Specification for Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings; 2022.
- C. ASTM E1264 - Standard Classification for Acoustical Ceiling Products; 2023.

1.03 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.

1.04 SUBMITTALS

- A. See Section 013000 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide data on suspension system components and acoustical units.
- C. Samples: Submit two full size samples illustrating material and finish of acoustical units.
- 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 Acoustical Units: Quantity equal to 5 percent of total installed.

1.05 QUALITY ASSURANCE

- A. Suspension System Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.
- B. Acoustical Unit Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

1.06 FIELD CONDITIONS

- A. Maintain uniform temperature of minimum 60 degrees F (16 degrees C), 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. Kinetics Noise Control, Inc: www.kineticsnoise.com/#sle.
 - 4. USG Corporation: www.usg.com/#sle.
 - 5. Substitutions: See Section 016000 - Product Requirements.
- B. Suspension Systems:
 - 1. Same as for acoustical units.

2.02 ACOUSTICAL UNITS

- A. Basis-of-design are Armstrong and Kinetics Products noted below subject to compliance with meeting or exceeding the requirements and exceeding the appearance quality of the basis of design based only on the opinion of the Architect. Other manufacturers may be acceptable if they meet project requirements.
 - 1. Acoustical Panel Schedule
 - a. APC-1: Certainteed, Symphony M Collection, white, 24" x 48"
 - b. APC-2: Certainteed, Vinylshield C, white, 24" x 48"
 - c. APC-3: Certainteed, Cashmere Style Customline, white Scoring Option 448, 24" x 48".
 - 2. Products:
 - a. Certainteed – Basis of Design
 - b. Armstrong
 - c. USG Ceilings

2.03 Suspension Systems

- A. Metal Suspension Systems - General: Complying with ASTM C635/C635M; die cut and interlocking components, with perimeter moldings, hold-down clips, stabilizer bars, clips, and splices as required.
 - 1. Materials:
 - a. Stainless Steel Grid: ASTM A666/A666M, Type 304.
- B. Exposed Suspension System: Stainless steel grid and cap.
 - 1. Applications: High humidity conditions.
 - 2. Structural Classification: Light-duty, when tested in accordance with ASTM C635/C635M.

3. Profile: Tee; 15/16 inch (24 mm) face width. – See Finish Schedule for additional information.
4. Finish: Manufacturer's standard polished finish.
5. Color: White.
6. Products:
 - a. USG Corporation; Donn Brand DXSS 15/16 inch Acoustical Suspension System: www.usg.com/#sle.

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 (2 mm) galvanized steel wire.
- C. Hold-Down Clips: Manufacturer's standard clips to suit application.
- D. Perimeter Moldings: Same metal and finish as grid.
 1. Size: As required for installation conditions and specified Seismic Design Category.
 2. Angle Molding: L-shaped, for mounting at same elevation as face of grid.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Verify that layout of hangers will not interfere with other work.

3.02 Preparation

- A. Install after major above-ceiling work is complete.
- B. Coordinate the location of hangers with other work.
- C. Provide hanger clips during steel deck erection. Provide additional hangers and inserts as required.

3.03 INSTALLATION - SUSPENSION SYSTEM

- A. Rigidly secure system, including integral mechanical and electrical components, for maximum deflection of 1:360.
- B. Lay out system to a balanced grid design with edge units no less than 50 percent of acoustical unit size.
- C. Perimeter Molding: Install at intersection of ceiling and vertical surfaces and at junctions with other interruptions.
 1. Use longest practical lengths.

- D. 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.
- E. 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.
- F. Do not support components on main runners or cross runners if weight causes total dead load to exceed deflection capability.
- G. Support fixture loads using supplementary hangers located within 6 inches (152 mm) of each corner, or support components independently.
- H. Do not eccentrically load system or induce rotation of runners.

3.04 INSTALLATION - ACOUSTICAL UNITS

- A. Install acoustical units in accordance with manufacturer's instructions.
- B. Fit acoustical units in place, free from damaged edges or other defects detrimental to appearance and function.
- C. Fit border trim neatly against abutting surfaces.
- D. Install acoustical units level, in uniform plane, and free from twist, warp, and dents.
- E. Cutting Acoustical Units:
 - 1. Make field cut edges of same profile as factory edges.
- F. Where round obstructions occur, provide preformed closures to match perimeter molding.

3.05 TOLERANCES

- A. Maximum Variation from Flat and Level Surface: 1/8 inch in 10 feet (3 mm in 3 m).
- B. Maximum Variation from Plumb of Grid Members Caused by Eccentric Loads: 2 degrees.

END OF SECTION

SECTION 095426 - SUSPENDED WOOD CEILINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Wood grilles.
- B. Metal suspension system.

1.02 RELATED REQUIREMENTS

- A. Section 095100 - Acoustical Ceilings: Metal suspension systems.

1.03 REFERENCE STANDARDS

- A. CISCA (WC) - Wood Ceilings Technical Guidelines; 2009.

1.04 SUBMITTALS

- A. See Section 013000 - Administrative Requirements for submittal procedures.
- B. Shop Drawings: Indicate grid layout and related dimensioning, attachment of wood ceiling components to grid, accessory attachments, junctions with other ceiling finishes, and mechanical and electrical items installed in the ceiling.
- C. Product Data: Provide data on wood ceiling components and suspension system components.
- D. Samples: Submit two full size samples illustrating material and finish of wood ceiling components.
- E. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
 - 1. See Section 016000 - Product Requirements for additional provisions.
 - 2. Wood Ceiling Components: Provide a quantity equal to 2 percent of total product installed.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Deliver wood ceiling components to project site in original, unopened packages.
- B. Store in fully enclosed space, flat, level and off the floor.

1.06 FIELD CONDITIONS

- A. Do not install suspended wood ceiling system until wet construction work is complete and permanent heat and air conditioning is installed and operating.
- B. Maintain room temperature between 60 degrees F (16 degrees C) and 75 degrees F (24 degrees C) and relative humidity between 35 to 55 percent before, during, and after installation.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Suspended Wood Ceilings: Basis of Design – Rulon International
 - 1. WS-01 – Wood Slat Ceiling – Rulon International – Linear Open, Red Oak, White Oak Stain, Satin Clear Finish, 4" Slim
 - 2. WS-02- Wood Panel Ceiling – Custom Milwork – White Oak, Clear Satin Finish
 - 3. Acceptable Alternates
 - a. 9 Wood
 - b. Armstrong
 - c. USG Ceilings

2.02 Suspended Wood Ceiling System

- A. Performance Requirements:
 - 1. Design for maximum deflection of 1/360 of span.
- B. Wood Grilles: Pre-assembled module of solid wood grilles with battens.
 - 1. Attachment to Suspension Grid: Manufacturer's recommended method according to panel product selected.
 - 2. Suspension System: See Section 095100.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Do not install ceiling until after interior wet work is dry.

3.02 Preparation

- A. Coordinate the location of hangers with other work.
- B. Provide hanger clips during steel deck erection. Provide additional hangers and inserts as required.
- C. Layout wood ceiling components in pattern according to reflected ceiling plan and as shown on shop drawings.
- D. Acclimate wood ceiling materials by removing from packaging in installation area a minimum of 48 hours prior to installation.

3.03 INSTALLATION

- A. General: Install suspended wood ceiling system in accordance with CISCA (WC).

- B. Perimeter Molding: Install at intersection of ceiling and vertical surfaces and at junctions with other interruptions.
- C. Wood Ceiling:
 - 1. Install wood ceilings in accordance with manufacturer's instructions.
 - 2. Fit wood components in place, free from damaged edges or other defects detrimental to appearance and function.
 - 3. Install components in uniform plane, and free from twist, warp, and dents.
 - 4. Cut to fit irregular grid and perimeter edge trim.
 - 5. Make field cut edges of same profile as factory edges, seal and finish according to manufacturer.

3.04 TOLERANCES

- A. Maximum Variation from Flat and Level Surface: 1/8 inch in 10 feet (3 mm in 3 m).

3.05 Cleaning

- A. See Section 017000 - Execution and Closeout Requirements for additional requirements.
- B. Clean and touch up minor finish damage. Remove and replace components that cannot be successfully cleaned and repaired.

END OF SECTION

SECTION 096466 - WOOD ATHLETIC FLOORING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Wood athletic flooring.
- B. Stage Flooring
- C. Subflooring.
- D. Sleepers.
- E. Resilient cushioning.
- F. Sheet vapor retarder.
- G. Floor finishes.
- H. Surface finishing and game markings.

1.02 RELATED REQUIREMENTS

- A. Section 099300 - Staining and Transparent Finishing: Stain and transparent surface materials for application in this section.

1.03 REFERENCE STANDARDS

- A. ASTM F2772 - Standard Specification for Athletic Performance Properties of Indoor Sports Floor Systems; 2024.
- B. DIN EN 14904 - Surfaces for Sports Areas – Indoor Surfaces for Multi-Sports Use – Specification; 2006.
- C. MFMA (PUR) - Performance and Uniformity Rating Sport Specific Standards; current edition.
- D. MFMA (SPEC) - Guide Specifications for Maple Flooring Systems; current edition.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Preinstallation Meetings: Convene a preinstallation meeting one week before starting work of this section; require attendance by affected installers; review preparation and installation procedures and coordination and scheduling necessary for related work.

1.05 SUBMITTALS

- A. See Section 013000 - 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 provisions for expansion and contraction, wall base, and game insert or socket devices.
 2. Indicate size and type fasteners and anchors.
 3. Indicate location, size, design, and color of game markings.
- D. Samples: Submit one sample of ActionCush II Plus, or approved equal to the Architect showing floor finish, color, and sheen.
- E. Manufacturer's Instructions: Indicate standard and special installation procedures and perimeter conditions requiring special attention.
- F. Maintenance Data: Include maintenance procedures and recommended maintenance materials.
- G. Manufacturer's qualification statement.
- H. Installer's qualification statement.
- I. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
1. See Section 016000 - Product Requirements, for additional provisions.

1.06 QUALITY ASSURANCE

- A. Perform work of this section in accordance with MFMA (SPEC).
- B. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section.
1. Minimum 10 years of documented experience.
 2. Member mill of the Maple Flooring Manufacturers Association, Inc (MFMA).
 3. Flooring system manufacturer shall be solvent with no bankruptcy proceedings the previous seven (7) years.
- C. Installer Qualifications: Company specializing in installing products specified in this section.
1. Minimum 7 years of documented experience.
 2. MFMA accredited and approved by flooring manufacturer.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. See Section 017419 - Construction Waste Management and Disposal for packaging waste requirements.
- B. Deliver materials and store off the floor in a well-ventilated, weather-tight space.

1.08 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 (13 degrees C) and 75 degrees F (24 degrees C) 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. By limiting the wide swings in atmospheric conditions inside the facility, the expansion and contraction of

the flooring system will be limited, as the flooring is manufactured at a moisture content most compatible with this range. A 15 percent fluctuation in indoor relative humidity will not adversely affect the maple. Excessive shrinking and/or expansion may occur with indoor relative humidity variations that exceed 15 percent. The geographical region and the HVAC determine the typical range of temperatures and humidity for each facility. In buildings where air conditioning is not available, the use of circulating fans will help facilitate excessive shrinking or expansion.

- C. Acclimate wood flooring materials to installation space a minimum of 48 hours prior to installation. Refer to the manufacturers installation instructions, follow all manufacturer guidelines and recommendations for acclimating the sports floor system to the gymnasium.
- D. Flooring must be stored in a dry, well-ventilated area, not in contact with masonry, to acclimate to building conditions and shall be installed at moisture content compatible with the normally expected environmental range of temperature and relative humidity achieved while the facility is occupied.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Basis of Design: Specifications are written around Robbins – Bio Channel Star. Other manufacturers may be approved if they meet project requirements. Other manufacturers include but are not limited to the following:
 - 1. Wood, Athletic-Flooring Assemblies:
 - a. Geflor.
 - b. Connor Sports.

2.02 Wood Athletic Flooring – WDF-01

- A. Vapor Retarder: 6 mil polyethylene.
- B. Maple Flooring Manufacturers Association (MFMA) Wood Flooring:
 - 1. Species: Northern hard maple.
 - 2. Grade: 2nd and better unless otherwise indicated.
 - 3. Seasoning: Kiln Dried
 - 4. Type: Finger-Jointed (FJ)
 - 5. Matching: Tongue and groove and end matched.
 - 6. Thickness: 25/32 inch.
 - 7. Face Width: 2-1/4 inches.
 - 8. Pattern: Straight lay (One directional)
 - 9. Expansion Option: PLUS Feature (Built-in expansion)
 - 10. Finish: Unfinished
- C. Wood Subflooring:
 - 1. 9/16" Zero/G shock pad.
 - 2. Bio-Channel Star Subfloor, (3/4" plywood panel)

3. Metal anchor channels
- D. Fasteners:
 1. Channel anchors – 2" Power SPIKE anchors
- E. Finishing Materials:
 1. Basis of Design: Specifications are written around Bona AB Bona SuperSport. Other manufacturers may be acceptable provided they meet project requirements. Other manufacturers include
 - a. Hillyard Inc.
 - b. MFMA approved oil modified Sealer
 - c. MFMA approved oil modified Finish
- F. Game lines:
 1. Basis of Design: Specifications are written around Bona CourtLines. Other manufacturers may be acceptable provided they meet project requirements. Other manufacturers include
 - a. Hillyard Inc.
 - b. Game line paint shall be as recommended by the finishing materials manufacturer and must be compatible with the finish.
- G. Perimeter:
 1. See 096513 for more information.

2.03 Stage Flooring - WDF-02

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following, or approved substitution:
 1. American Harlequin Corporation; 1531 Glen Avenue, Moorestown, NJ 08057, 800-642-6440, www.us.harlequinfloors.com.
 2. Robbins Performing Arts, a Division of Robbins, Inc.; 4777 Eastern Avenue, Cincinnati, OH 45226, 800-831-8987, www.robbinsdancefloors.com.
 3. Stagestep, Inc.; 4701 Bath Street, #46 B, Philadelphia, PA 19137, 800-523-0960, www.stagestep.com
- B. Sprung Floor System, SF-1
 1. System: A sprung floor system consisting of sub-floor construction utilizing system-specific components with an integrate finish surface.
 - a. Performance
 - 1) Maximum Distribute Load: 1,380 lbs/sy
 - 2) Maximum Dynamic Load: 645 lbs/sy
 - 3) Weight: 47-50 lbs/sy
 - 4) Overall Thickness: 2 ½"
 - b. Finished Surface
 - 1) Tempered Hardboard, 3/8" nominal thickness, field painted.
- C. Perimeter:
 1. See 096513 for more information

2.04 Wood Flooring – WDF-03

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following, or approved substitution:
 1. Nydree Flooring
 - a. High Traffic Commercial / Acrylic Infused
 - b. Match WDWP-01 White Oak Finish, Clear Satin, Non Combustable

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify existing conditions before starting this work.
- B. Inspect concrete slab for proper tolerances reporting any discrepancies in writing to the general contractor.
- C. All work to put the concrete slab in acceptable condition shall be the responsibility of the general contractor.
- D. Slab shall be broom cleaned by the general contractor prior to the installation of the new wood sports flooring system.
- E. Verify that concrete subfloor surface is smooth and flat to plus or minus 1/8 - inch in 10 feet (____ mm in 3 m) variance from level.
- F. Grind high spots and fill low spots to provide a maximum 1/8 - inch deviation in any direction when checked with a 10-foot straight edge.
- G. 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 (150 mm) and seal with adhesive, or 2" tape.
- B. Resilient Underlayment: Install in accordance with manufacturer's instructions.
- C. Sleepers with Plywood Subfloor:
 - 1. Place sleepers end-to-end in a brick pattern at 90 degree angles to direction of finished floor; space 12 inches (300 mm) on center. Stagger end joints a minimum of 24 inches (610 mm) and fasten at overlapping ends. Allow 2" voids at the perimeter and vertical obstructions.
 - 2. Fasten plywood subfloor over sleepers at a 45 or 90 - degree angle to direction of finished floor. Allow minimum 1/4 inch (6 mm) between plywood subfloor edges and breaking joints 4' (1.2m)
 - 3. Install solid blocking at doorways, bleacher stack areas or under portable goals as needed.
- D. Installation Tolerances: 1/8-inch in 10-feet variance from level.
- E. Wood Flooring:
 - 1. Install in accordance with manufacturer's and MFMA instructions.

2. Lay flooring parallel to length of main playing area. Blind nail to sleepers, mechanically fastened at 10" - 12" (300 mm) o.c. End joints must be properly driven up. Provide adequate expansion at regular intervals across the floor during installation as dictated by the average humidity conditions of the area according to the recommendations of the local Action Floor Systems, LLC., or approved equal flooring contractor.
 3. Install edge strips at unprotected or exposed edges, and where flooring terminates.
 4. Provide 2 inch (24 mm) expansion space at walls and other interruptions.
- F. Install base at floor perimeter to cover expansion space in accordance with manufacturer's instructions. Miter inside corners.
- G. Install floor sockets and inserts to a depth sufficient to ensure flush top surface with floor surface.
- H. Floor Sanding:
1. Allow installed flooring to acclimate to ambient conditions for at least ten-days before sanding.
 2. Machine sand with coarse, medium and fine grades of sandpaper to achieve a level, smooth, uniform surface without ridges or cups.
 3. After sanding, buff entire floor using 100-grit screen or equal grit sandpaper, with a heavy duty buffing machine.
 4. Remove sanding dust by tack or vacuum, or both prior to first finish coat.
 5. Floor shall present a smooth surface without drum stop marks, gouges, streaks, or shiners.
- I. Finishing:
1. Mask off adjacent surfaces before beginning sanding.
 2. Inspect entire area of floor to ensure that the surface is acceptable for finishing, completely free from sanding dust and perfectly clean.
 3. Apply seal and finish per manufacturer's written instructions.
 4. Buff and vacuum, or tack between each coat after it dries.
 5. Apply finishes in accordance with floor finish manufacturer's and MFMA instructions. Provide not less than four-coats total and not less than two-finish coats.
 6. 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.
 7. Apply game lines/markers and logos accurately after the seal coat, after buffing and vacuuming. Layout in accordance with the drawings. For game lines, use current rules of association having jurisdiction. Lines shall be straight with sharp edges in colors selected by the architect. Game line paint shall be compatible with the finish.
 8. Apply last coat of finish.

3.04 BASE INSTALLATION

- A. Affix rubber base to wall with recommended adhesive or screws. Miter all corners carefully. Use pre-molded outside corners. Install aluminum thresholds as required, anchoring firmly in concrete floor beyond the limits of wood flooring.

3.05 CLEANING

- A. Clean floor surfaces in accordance with floor finish manufacturer's instructions.

3.06 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

SECTION 096500 - RESILIENT FLOORING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Resilient sheet flooring.
- B. Resilient base.
- C. Installation accessories.

1.02 RELATED REQUIREMENTS

- A. Section 016116 - Volatile Organic Compound (VOC) Content Restrictions.
- B. Section 033000 - 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; 2025.
- B. ASTM F1303 - Standard Specification for Sheet Vinyl Floor Covering with Backing; 2004 (Reapproved 2021).
- C. ASTM F1861 - Standard Specification for Resilient Wall Base; 2021 (Reapproved 2025).
- 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 013000 - 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. Selection Samples: Submit manufacturer's complete set of color samples for Architect's initial selection.
- D. Maintenance Data: Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning, stripping, and re-waxing.
- E. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
 - 1. See Section 016000 - Product Requirements, for additional provisions.
 - 2. Extra Flooring Material: 100 square feet (_____ square meters) of each type and color.
 - 3. Extra Wall Base: 100 linear feet (_____ linear meters) of each type and color.

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. Store all materials off of the floor in an acclimatized, weather-tight space.
- B. Maintain temperature in storage area between 55 degrees F (13 degrees C) and 90 degrees F (72 degrees C).
- C. Protect roll materials from damage by storing on end.

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 (21 degrees C) to achieve temperature stability. Thereafter, maintain conditions above 55 degrees F (13 degrees C).

PART 2 PRODUCTS

2.01 SHEET FLOORING

- A. Vinyl Sheet Flooring – Type RF-01 - Color and pattern throughout wear layer thickness, with backing.
 - 1. Manufacturers:
 - a. Interface – Textured Wood Grains, Level Set – 9.84"x39.37" – Basis of Design
 - b. Patcraft
 - c. Tarkett
 - d. Mannington
 - 2. Color: Antique Light Oak
- B. Welding Rod: Solid bead in material compatible with flooring, produced by flooring manufacturer for heat welding seams, and in color matching field color.

2.02 ACCESSORIES

- A. Subfloor Filler: White premix latex; type recommended by adhesive material manufacturer.
- B. Primers, Adhesives, and Seam Sealer: Waterproof; types recommended by flooring manufacturer.
- C. Adhesive for Vinyl Flooring:
 - 1. Manufacturers:

- a. TEC Specialty Products LLC; TEC Flexera 2K PSA Hybrid Adhesive: www.tecspecialty.com/#sle.
 - b. TEC Specialty Products LLC; TEC Flexera High Tack Premium Universal Adhesive: www.tecspecialty.com/#sle.
 - c. Loba-Wakol, LLC; WAKOL MS 552 Resilient and Rubber Flooring Adhesive: www.loba-wakol.com/#sle.
 - d. Stauf USA, LLC; D737 High-Tack: www.staufusa.com/#sle.
 - e. Substitutions: Section 016000 - Product Requirements.
- D. Moldings, Transition and Edge Strips: Same material as flooring.
- 1. TS-02 – Floor Transition – Roppe - #45 Reducer – To Match B-01
 - 2. TS-03 – Floor Transition – Johnsonite – Reducers SSR-XX-B – To Match B-01

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. Remove subfloor ridges and bumps. Fill minor low spots, cracks, joints, holes, and other defects with subfloor filler to achieve smooth, flat, hard surface.
- B. Prohibit traffic until filler is fully cured.
- C. Clean substrate.

3.03 Installation - General

- A. Starting installation constitutes acceptance of subfloor conditions.
- B. Install in accordance with manufacturer's written instructions.

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. Seal seams by heat welding where indicated.

3.05 CLEANING

- A. Remove excess adhesive from floor, base, and wall surfaces without damage.
- B. Clean in accordance with manufacturer's written instructions.

3.06 PROTECTION

- A. Prohibit traffic on resilient flooring for 48 hours after installation.

END OF SECTION

SECTION 096513 - RESILIENT BASE AND ACCESSORIES

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 SUMMARY

- A. Section Includes:
 - 1. Wall Base.
 - 2. Transition Strips.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Samples: For each exposed product and for each color and texture specified but not less than 12-inches-long.
- C. Samples for Initial Selection: For each type of product indicated.
- D. Samples for Verification: For each type of product indicated and for each color, texture and pattern required in manufacturers standard-size samples, but not less than 12-inches-long.
- E. Product Schedule: For resilient base and accessory products. Use same designations indicated on drawings.

1.4 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. Furnish not less than 10-linear-feet for every 500-linear-feet or fraction thereof, of each type, color, pattern and size of resilient product installed.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Store resilient products and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 50 deg F or more than 90 deg F.

1.6 FIELD CONDITIONS

- A. Maintain ambient temperatures within range recommended by manufacturer, but not less than 70 deg F or more than 95 deg F in spaces to receive resilient products during the following time periods:
 - 1. 48 hours before installation.
 - 2. During installation.
 - 3. 48 hours after installation.
- B. After installation and until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer, but not less than 55 deg F or more than 95 deg F.
- C. Install resilient products after other finishing operations, including painting, have been completed.

PART 2 - PRODUCTS

2.1 Resilient Base: ASTM F1861, Type TP, rubber, thermoplastic; style as scheduled.

- A. Manufacturers:
 - 1. Johnsonite: Basis of Design
 - 2. Roppe
 - 3. Mannington
- B. B-01 – Johnsonite 4" Cove Base – 63 Burnt Umber
- C. B-02 – Johnsonite 3"x4"H Sprung Flooring Vented Cove Base – 63 Burnt Umber

2.2 ACCESSORIES

- A. Rubber & Metal Accessory Molding: Where indicated, provide rubber accessory molding complying with the following:
 - 1. Products: As follows:
 - a. Johnsonite
 - 2. Color: As selected by Architect from manufacturer's full range of colors produced for rubber accessory molding complying with requirements indicated.
 - 3. Profile and Dimensions: As specified by product designation indicated above.
- B. Two-piece mechanically fastened transition strip

2.3 INSTALLATION MATERIALS

- A. Trowelable Leveling and Patching Compounds: Latex-modified, portland cement based or blended hydraulic-cement-based formulation provided or approved by resilient-product manufacturer for applications indicated.
- B. Adhesives: Water-resistant type recommended by resilient-product manufacturer for resilient products and substrate conditions indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the work.
 - 1. Verify that finishes of substrates comply with tolerances and other requirements specified in other sections and that substrates are free of cracks, ridges, depressions, scale and foreign deposits that might interfere with adhesion of resilient products.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.
 - 1. Installation of resilient products indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Prepare substrates according to manufacturers written instructions to ensure adhesion of resilient products.
- B. Fill cracks, holes and depressions in substrates with trowelable leveling and patching compound; remove bumps and ridges to produce a uniform and smooth substrate.
- C. Do not install resilient products until they are the same temperature as the space where they are to be installed.
 - 1. At least 48 hours in advance of installation, move resilient products and installation materials into spaces where they will be installed.
- D. Immediately before installation, sweep and vacuum clean substrates to be covered by resilient products.

3.3 RESILIENT BASE INSTALLATION

- A. Comply with manufacturers written instructions for installing resilient base.
- B. Apply resilient base to walls, columns, pilasters, casework and cabinets in toe spaces and other permanent fixtures in rooms and areas where base is required.

- C. Install resilient base in lengths as long as practical without gaps at seams and with tops of adjacent pieces aligned.
- D. Tightly adhere resilient base to substrate throughout length of each piece, with base in continuous contact with horizontal and vertical substrates.
- E. Do not stretch resilient base during installation.
- F. On masonry surfaces or other similar irregular substrates, fill voids along top edge of resilient base with manufacturers recommended adhesive filler material.
- G. Preformed Corners: Install preformed corners before installing straight pieces.
- H. Job-Formed Corners:
 - 1. Outside Corners: Use straight pieces of maximum lengths possible and form with returns not less than 3-inches in length.
 - a. Form without producing discoloration (whitening) at bends.
 - 2. Inside Corners: Use straight pieces of maximum lengths possible and form with returns not less than 3-inches in length.
 - a. Miter or cope corners to minimize open joints.

3.4 RESILIENT ACCESSORY INSTALLATION

- A. Comply with manufacturers written instructions for installing resilient accessories.
- B. Resilient Molding Accessories: Butt to adjacent materials and tightly adhere to substrates throughout length of each piece. Install reducer strips at edges of floor covering that would otherwise be exposed.

3.5 CLEANING AND PROTECTION

- A. Comply with manufacturers written instructions for cleaning and protecting resilient products.
- B. Perform the following operations immediately after completing resilient-product installation:
 - 1. Remove adhesive and other blemishes from exposed surfaces.
 - 2. Sweep and vacuum horizontal surfaces thoroughly.
 - 3. Damp-mop horizontal surfaces to remove marks and soil.
- C. Protect resilient products from mars, marks, indentations and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.

END OF SECTION 096513

SECTION 096566 - RESILIENT ATHLETIC FLOORING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Performance Vulcanized Composition Rubber Rolls
- B. Adhesives.

1.02 RELATED REQUIREMENTS

- A. Section 033000 - Cast-in-Place Concrete: Restrictions on curing compounds for concrete slabs and floors to receive adhesive-applied flooring.

1.03 REFERENCE STANDARDS

- A. ASTM D412 - Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers-- Tension; 2016 (Reapproved 2021).

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Preinstallation Meeting: Convene a preinstallation meeting one week before starting work of this section; attendance by all affected installers; review preparation and installation procedures and coordination and scheduling necessary for related work.

1.05 SUBMITTALS

- A. See Section 013000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Manufacturer's printed data sheets for products specified.
- C. Shop Drawings: Fabrication and installation details, and layout, colors, and widths of game lines and equipment locations.
- D. Selection Samples: Manufacturer's color charts for flooring materials specified and game line paints, indicating full range of colors and textures available.
- E. Manufacturer's Instructions: Indicate standard and special installation procedures.
- F. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
 - 1. See Section 016000 - Product Requirements, for additional provisions.
 - 2. Extra Flooring Material: 10 square yards (9 sq m) matching installed flooring.

1.06 QUALITY ASSURANCE

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

1.07 DELIVERY, STORAGE, AND HANDLING

- A. See Section 017419 - Construction Waste Management and Disposal for packaging waste requirements.
- B. Deliver materials to project site in unopened containers clearly labeled with manufacturer's name and identification of contents.
- C. Store materials in dry and clean location until needed for installation. During installation, handle in a manner that will prevent marring and soiling of finished surfaces.

1.08 WARRANTY

- A. Manufacturer's Warranty: Submit, for owner's acceptance, manufacturer's standard warranty document executed by authorized company official. Manufacturer's warranty is in addition to and not a limitation of, other rights owner may have under Contract Documents.
 - 1. Warranty Period: 10 years commencing after date of substantial completion.

PART 2 PRODUCTS

2.01 PREFORMED ATHLETIC FLOORING

- A. BASIS OF DESIGN: ARF-01: Ecore – Performance Beast Plus – Urban Slate ES515
 - 1. Other manufacturers may be acceptable provided they comply with the project requirements.

2.02 ACCESSORIES

- A. Leveling Compound: Latex-modified cement formulation as recommended by flooring manufacturer for substrate conditions.
- B. Flooring Adhesive: Waterproof; types recommended by flooring manufacturer.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Examine substrates for conditions detrimental to installation of athletic flooring. Proceed with installation only after unsatisfactory conditions have been corrected.
- B. Verify that surfaces are flat to tolerances acceptable to flooring manufacturer, free of cracks that might telegraph through flooring, clean, dry, and free of curing compounds, surface hardeners, and other chemicals that might interfere with bonding of athletic flooring to substrate.

- 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. Concrete: Use leveling compound as necessary to achieve substrate flatness of plus or minus 1/8 inch within 10 ft radius (1/1000).
- B. Remove coatings that are incompatible with flooring adhesives, using methods recommended by flooring manufacturer.
- C. Broom clean areas to receive athletic flooring immediately before beginning installation.

3.03 INSTALLATION

- A. Starting installation constitutes acceptance of subfloor conditions.
- B. Install in accordance with manufacturer's written instructions.

3.04 CLEANING

- A. Clean flooring using methods recommended by manufacturer.

3.05 PROTECTION

- A. Protect finished athletic flooring from construction traffic to ensure that it is without damage upon Date of Substantial Completion.

END OF SECTION

SECTION 096700 - FLUID-APPLIED FLOORING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Fluid-applied flooring and base.

1.02 RELATED REQUIREMENTS

- A. Section 079200 - Joint Sealants: Sealing joints between fluid-applied flooring and adjacent construction and fixtures.

1.03 REFERENCE STANDARDS

- A. ASTM F710 - Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring; 2022.
- B. ICRI 310.2R - Selecting and Specifying Concrete Surface Preparation for Sealers, Coatings, Polymer Overlays, and Concrete Repair; 2013.

1.04 SUBMITTALS

- A. See Section 013000 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide data on specified products, describing physical and performance characteristics; sizes, patterns and colors available; and _____.
- C. Manufacturer's Installation Instructions: Indicate special procedures, perimeter conditions requiring special attention, and application rate for each coat.
- D. Maintenance Data: Include maintenance procedures, recommended maintenance materials, procedures for stain removal, repairing surface, and suggested schedule for cleaning.
- E. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
 - 1. See Section 016000 - Product Requirements, for additional provisions.
 - 2. Extra Top Coat Materials: 2 gallons (8 liters).

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with minimum three years documented experience.
- B. Applicator Qualifications: Company specializing in performing the work of this section.
 - 1. Approved by manufacturer.

1.06 MOCK-UPS

- A. See Section 014000 - Quality Requirements for additional requirements.
- B. Construct mock-up(s) of fluid applied flooring to serve as basis for evaluation of texture and workmanship.
 - 1. Number of Mock-Ups to be Prepared: One.
 - 2. Use same materials and methods for use in the work.
 - 3. Use approved design samples as basis for mock-ups.
 - 4. Locate where directed.
 - 5. Minimum Size: 48 inches by 48 inches (1220 mm by 1220 mm).
- C. See Section 014000 - Quality Requirements for additional requirements.
- D. Obtain approval of mock-up by Architect before proceeding with work.
- E. Approved mock-up may remain as part of the work.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Store resin materials in a dry, secure area.
- B. Store materials for three days prior to installation in area of installation to achieve temperature stability.

1.08 FIELD CONDITIONS

- A. Maintain minimum temperature in storage area of 55 degrees F (13 degrees C).
- B. Store materials in area of installation for minimum period of 24 hours prior to installation.
- C. Maintain ambient temperature required by manufacturer 72 hours prior to, during, and 24 hours after installation of materials.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Fluid-Applied Flooring:
 - 1. Stonhard – Basis of Design
 - 2. Sherwin Williams
 - 3. Dur-a-Flex
 - 4. Tnemec Company

2.02 Fluid-Applied Flooring SYSTEMS

- A. EPX-01 - Fluid-Applied Flooring: Stonhard – Stonetec QBF
 - 1. Aggregate: Stontec Flakes
 - 2. Top Coat: Epoxy Sealer
 - 3. System Thickness: 1/16 inch (1.5 mm), nominal, dry film thickness (DFT).

4. Color: Smokey Mountains SM
- B. EXP-02 - Fluid-Applied Flooring: Stonhard – Stonclad UT
 1. Aggregate: Silica Pigmented Quartz
 2. Coating System: Polyurethan Mortar System
 3. System Thickness: 1/4 inch (6.4 mm), nominal, dry film thickness (DFT).
 4. Color: As selected by Architect.

2.03 ACCESSORIES

- A. Primer: Type recommended by fluid-applied flooring manufacturer.

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 flooring.
- B. Verify that subfloor surfaces are dust-free and free of substances that could impair bonding of materials to subfloor surfaces.
- C. Verify that required floor-mounted utilities are in correct location.

3.02 PREPARATION

- A. Remove subfloor ridges and bumps. Fill low spots, cracks, joints, holes, and other defects with subfloor filler.
- B. Prepare concrete surfaces according to ICRI 310.2R.
- C. Apply, trowel, and float filler to achieve smooth, flat, hard surface. Grind irregularities above the surface level. Prohibit traffic until filler is cured.
- D. Vacuum clean substrate.
- E. Apply primer to surfaces required by flooring manufacturer.

3.03 INSTALLATION - Accessories

- A. Install cant strips at base of walls where flooring is to be extended up wall as base.
- B. Install terminating cap strip at top of base; attach securely to wall substrate.

3.04 INSTALLATION - FLOORING

- A. Apply in accordance with manufacturer's instructions.
- B. Apply each coat to minimum thickness required by manufacturer.
- C. Finish to smooth level surface.

3.05 PROTECTION

- A. Prohibit traffic on floor finish for 48 hours after installation.
- B. Barricade area to protect flooring until fully cured.

END OF SECTION

SECTION 096813 - TILE CARPETING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Carpet tile, fully adhered.

1.02 SUBMITTALS

- A. See Section 013000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on specified products, describing physical and performance characteristics; sizes, patterns, colors available, and method of installation.
- C. Samples: Submit two carpet tiles illustrating color and pattern design for each carpet color selected.
- D. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
 - 1. See Section 016000 - Product Requirements, for additional provisions.
 - 2. Extra Carpet Tiles: Quantity equal to 5 percent of total installed of each color and pattern installed.

1.03 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing specified carpet tile with minimum three years documented experience.
- B. Installer Qualifications: Company specializing in installing carpet tile with minimum three years documented experience and approved by carpet tile manufacturer.

1.04 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. Basis of Design: Carpet specification is written around Patcraft. Other carpet manufacturers may be acceptable provided they meet project requirements. Carpet construction and performance requirements for required type of carpet are as follows: evaluation criteria may include yarn, type, color selection, texture, etc.
- B. Tile Carpet – Basis of Design is Patcraft:

1. CPT-01: Patcraft – Inspired – Influence 10563 – Affinity 00550
 - a. JJ Flooring – Cosmos
 - b. Mannington – Creased Paper
 - c. Tarkett – Savuer – Tarkett Commercial
2. CPT-02: Patcraft – Deconstructed Felt - Topstitch 10539 – 00900 Purple
 - a. JJ Flooring – Adapt
 - b. Mannington Phenomena
 - c. Tarkett – Light Shift
3. CPT-03: Patcraft: Deconstructed Form - Texture Slant 10602 – 100150 Contour
 - a. JJ Flooring: Artistry
 - b. Mannington – Valley Fold
 - c. Tarkett – Cultivate Growth
4. CPT-04: Patcraft: Deconstructed Felt - Binary 00950 - Purple Platinum
 - a. JJ Flooring – Quill
 - b. Mannington – Multiplexer
 - c. Tarkett – Create Balance
5. WOC-01: Patcraft: Walk Forward – Connecting 1035 / Saunter 00560
 - a. JJ Flooring
 - b. Mannington
 - c. Tarkett

2.02 ACCESSORIES

- A. Subfloor Filler: White premix latex; type recommended by flooring material manufacturer.
- B. Edge Strips: Embossed aluminum, color matched
- C. Carpet Tile Adhesive: Recommended by carpet tile manufacturer; releasable type.

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 subfloor surfaces are dust-free and free of substances that could impair bonding of adhesive materials to subfloor surfaces.

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.
- 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. Fully adhere carpet tile to substrate.
- G. Trim carpet tile neatly at walls and around interruptions.
- H. 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

SECTION 097200 - WALL COVERINGS

PART 1 GENERAL

1.01 Section Includes

- A. Wall coverings.

1.02 Submittals

- A. See Section 013000 - Administrative Requirements for submittal procedures.
- B. Product Data: Manufacturer's data sheets for wall covering and adhesive. Indicate compliance with specified flame spread and smoke developed ratings.
- C. Shop Drawings: Indicate wall elevations with seaming layout.
- D. Samples: Submit two samples of wall covering, 6 by 6 inches (152 by 152 mm) in size, illustrating color, finish, and texture.

1.03 Quality Assurance

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with minimum 3 years of documented experience.
- B. Installer Qualifications: Company specializing in performing work of type specified, with minimum 3 years of documented experience.

PART 2 PRODUCTS

2.01 Wall Coverings

- A. Wall Covering – Type VWC-01: Basis of Design: 3M Envision Print Wrap Film
 - 1. Comply with ASTM F793/F793M, Category V, Type II.
 - 2. Color: Custom Graphics
 - 3. Pattern: As indicated on drawings.
 - 4. Surface Texture: Smooth Matte Canvas.

2.02 Accessories

- A. Adhesive: Type recommended by wall covering manufacturer.

PART 3 EXECUTION

3.01 Examination

- A. Verify substrate surfaces are primed and meet manufacturer's requirements to receive work.
- B. Measure moisture content of substrates with electronic moisture meter. Do not apply wall coverings if moisture content of substrate exceeds level recommended by wall covering manufacturer.
- C. Verify flatness tolerance of surfaces does not vary more than 1/8 inch in 10 feet (3 mm in 3 m) or at rate greater than 1/16 inch/ft (5 mm/m).
- D. Notify Architect of detrimental conditions affecting wall covering installation.
- E. Correct detrimental conditions before starting installation.

3.02 Preparation

- A. Remove wall plates and accessories impeding wall covering installation.
- B. Substrate Priming and Preparation – Prep to Leve 5 Finish
 - 1. Fill cracks in substrate and correct irregularities with filler; sand smooth.
 - 2. For marks capable of bleeding through surface finishes, seal with shellac.
 - 3. Apply one coat of primer sealer to substrate surfaces. Allow to dry. Lightly sand smooth.
- C. Wash impervious surfaces with tetra-sodium phosphate; rinse and neutralize; wipe dry.
- D. Surface Appurtenances: Remove or mask electrical plates, hardware, light fixture trim, escutcheons, and fittings before preparing surfaces or finishing.
- E. Correct surface defects affecting work of this section and clean surfaces. Remove existing coatings exhibiting loose surface defects.
- F. Vacuum surfaces to remove loose particles.

3.03 Installation

- A. Apply adhesive and wall covering in accordance with manufacturer's instructions.
- B. Apply adhesive to wall immediately before applying wall covering.
- C. Use wall covering in roll number sequence.
- D. Razor trim edges of wall covering. Do not razor trim on gypsum board surfaces.
- E. Smoothly apply wall covering without wrinkles, gaps, or overlaps. Eliminate air pockets and ensure full bond to substrate surface.
- F. Horizontal seams are not permitted.
- G. Do not seam within 2 inches (51 mm) of internal corners or within 6 inches (152 mm) of external corners.
- H. Cover spaces above and below windows and above doors in pattern sequence from roll.

- I. Where wall covering tucks into reveals, metal wallboard, or plaster stops, use contact adhesive within 6 inches (152 mm) of wall covering termination. Ensure complete contact bond.
- J. Remove excess adhesive from seams while wet and before proceeding to next wall covering sheet.
- K. Reinstall wall plates and accessories removed to accommodate work of this section.

3.04 Protection

- A. Protect installed products from damage until mm-dd-yyyy.

END OF SECTION

SECTION 097800 - INTERIOR WALL PANELING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Metal interior wall paneling.

1.02 SUBMITTALS

- A. See Section 013000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Submit manufacturer's descriptive literature for each specified product; include data to indicate _____. Include anchorage devices specific to project substrate types.
- C. Samples: Submit two samples 12 by 12 inches (300 by 300 mm) in size, indicating finish, surface design, and color for each type of panels; _____.
- D. Manufacturer's Instructions: Provide manufacturer's installation instructions.

1.03 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with at least five years of documented experience.
- B. Installer Qualifications: Company specializing in installing work of the type specified in this section, and with at least three years of documented experience.

1.04 Delivery, Storage, and Handling

- A. Deliver products to project site in manufacturer's original packaging, marked with manufacturer's product identification.
- B. Store panels flat, indoors, on a clean, dry surface. Remove packaging and allow panels to acclimate to room temperature for 48 hours prior to installation.

1.05 Warranty

- A. See Section 017800 - Closeout Submittals for additional warranty requirements.
- B. Extended Correction Period: Correct defective work within a 5-year period for commencing on the Date of Substantial Completion.

PART 2 PRODUCT

2.01 METAL INTERIOR WALL PANELING

- A. Metal Wall Panel System: - SSWP-01

1. Applications: Wall cladding.
 2. Panel Size: 4 by 8 feet (1.2 by 2.4 m).
 3. Thickness: 20 Gauge
 4. Finish: Stainless Steel
- B. Materials: High-pressure laminate with aluminum sheet facing.
 - C. Fabrication: Shop fabricate to greatest extent possible.
 - D. Adhesive: Type recommended by panel manufacturer.
 - E. See Food Service Drawings and Specifications for additional information.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify existing conditions and substrate flatness before starting work.
- B. Verify that substrate surfaces for adhered items are clean and smooth.
 1. Test painted or wall covering surfaces for adhesion in inconspicuous area, as recommended by manufacturer.
- C. Start of installation constitutes acceptance of project conditions.

3.02 INSTALLATION

- A. Install panels in accordance with manufacturer's instructions.
- B. Apply adhesive to back side of panel using trowel recommended by adhesive manufacturer.
- C. Apply panels to wall with vertical joints plumb and horizontal joints level and pattern aligned with adjoining panels.
- D. Using a roller, apply pressure to panel face to ensure proper adhesion between surfaces.
- E. Install panels with manufacturer's recommended gaps for panel field and corner joints.
- F. Install trim with adhesive.
- G. Seal joints at wall base and between panels with approved sealant to prevent moisture intrusion.
- H. Remove excess sealant after paneling is installed and prior to curing.

3.03 Adjusting

- A. Replace paneling installed out of plumb and/or not aligned with adjacent panels or construction.

3.04 CLEANING

- A. Clean panel faces using cleaning agents and methods recommended by manufacturer to remove soiling.

3.05 PROTECTION

- A. Protect installed interior wall paneling from subsequent construction operations.

END OF SECTION

SECTION 098430 - SOUND-ABSORBING WALL AND CEILING UNITS

PART 1 GENERAL

1.01 Section Includes

- A. Sound-absorbing panels.
- B. Mounting accessories.

1.02 Submittals

- A. See Section 013000 - Administrative Requirements for submittal procedures.
- B. Product Data: Manufacturer's printed data sheets for products specified.
- C. Selection Samples: Manufacturer's color charts for fabric covering, indicating full range of fabrics, colors, and patterns available.

1.03 Quality Assurance

- A. Manufacturer Qualifications: Company specializing in manufacturing products of the type specified in this section, with at least three years of documented experience.

1.04 Delivery, Storage, and Handling

- A. Protect acoustical units from moisture during shipment, storage, and handling. Deliver in factory-wrapped bundles; do not open bundles until units are needed for installation.
- B. Store units flat, in dry, well-ventilated space; do not stand on end.
- C. Protect edges from damage.

PART 2 PRODUCTS

2.01 DIRECT-ATTACH TECTUM WALL PANELS (AWP-1, AWP-4, AWP-5, AWP-6, AWP-7, AWP-08)

- A. Basis of Design: The specifications were written around "Tectum – Direct Attach wall panels" Other manufacturers may be approved provided they meet project requirements.
- B. Materials: Tectum Wood Fiber
- C. Colors: Custom Color : SW 6559 Concord Grape, PT-02 for AWP-07 & AWP-08 Only.
- D. Panel Thickness: 1"
- E. Panel Size: See Finish Schedule
- F. Fire Rating: Class A

2.02 BACK-MOUNTED, EDGE-REINFORCED ACOUSTICAL WALL PANELS WITH GLASS-FIBER BOARD CORE (AWP-2)

- A. Basis of Design: The specifications were written around Guildford of Maine/Duvaltext. Other manufacturers may be approved provided they meet project requirements.
- B. Panel Size: As indicated in Drawings
- C. Panel Thickness: 2"
- D. Color: Spinel 3582 - Obsidian 021
- E. Acceptable Alternate MFR.
 - 1. Carnegie
 - 2. Designtex

2.03 BACK-MOUNTED, EDGE-REINFORCED ACOUSTICAL WALL PANELS WITH GLASS-FIBER BOARD CORE (AWP-3)

- A. Basis of Design: The specifications were written around Guildford of Maine/Duvaltext. Other manufacturers may be approved provided they meet project requirements.
- B. Panel Size: As indicated in Drawings
- C. Panel Thickness: 2"
- D. Color: Marlstone 2194 – Amethyst 929
- E. Acceptable Alternate MFR.
 - 1. Carnegie
 - 2. Designtex

PART 3 EXECUTION

3.01 Examination

- A. Examine substrates for conditions detrimental to installation of acoustical units. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 Installation

- A. Install acoustical units in locations as indicated, following manufacturer's installation instructions.
- B. Install mounting accessories and supports in accordance with shop drawings.
- C. Suspend ceiling baffles at locations and heights as indicated.
- D. Install acoustical units to construction tolerances of plus or minus 1/16 inch (1.6 mm) for the following:
 - 1. Plumb and level.

2. Flatness.

3.03 Cleaning

- A. Clean 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

SECTION 099000 - PAINTING AND COATING - K-12 EDUCATION FACILITY GUIDE

SPECIFICATION - SHERWIN-WILLIAMS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Surface preparation.
- B. Interior painting and coating systems.
- C. Exterior painting and coating systems.
- D. Scope:
 - 1. Finish surfaces exposed to view, unless fully factory-finished and unless otherwise indicated, including the following:
 - a. Exterior:
 - 1) Concrete: Cementitious siding, Flexboard, Transite, non-roof shingles, common brick, stucco, tilt-up concrete, precast, and cast-in-place concrete.
 - 2) Masonry: Concrete masonry units or concrete brick.
 - 3) Metal, Miscellaneous: Iron, ornamental iron, structural iron and steel, and other ferrous metal.
 - b. Interior:
 - 1) Concrete, Walls and Ceilings: Cast-in-place concrete, precast concrete, unglazed brick, fiber cement board, tilt-up, and plaster.
 - 2) Concrete Masonry Units: Concrete, split face, scored, smooth, high density, low density, and fluted.
 - 3) Metal, Galvanized: Ceilings and ductwork.
 - 4) Metal: Structural steel columns, joists, trusses, beams, miscellaneous and ornamental iron, structural iron, and other ferrous metal.
 - 5) Drywall: Walls, ceilings, gypsum board, and similar items.

1.02 RELATED REQUIREMENTS

- A. Section 055000 - Metal Fabrications: Shop-primed items.
- B. Section 071900 - Water Repellents.

1.03 REFERENCE STANDARDS

- A. SSPC-SP 1 - Solvent Cleaning; 2015, with Editorial Revision (2016).
- B. SSPC-SP 2 - Hand Tool Cleaning; 2024.
- C. SSPC-SP 6/NACE No.3 - Commercial Blast Cleaning; 2006.
- D. SSPC-SP 13/NACE No.6 - Surface Preparation of Concrete; 2018.

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. Product characteristics.
 - 2. Surface preparation instructions and recommendations.
 - 3. Primer requirements and finish specification.
 - 4. Storage and handling requirements and recommendations.
 - 5. Application methods.
 - 6. Clean-up information.

1.05 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, product name, product code, color designation, VOC content, batch date, environmental handling, surface preparation, application, and use instructions.
- C. Paint Materials: Store at a minimum 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. Handling: Maintain a clean, dry storage area to prevent contamination or damage to materials.

1.06 FIELD CONDITIONS

- A. Do not apply materials when environmental conditions are outside the ranges required by manufacturer.
- B. Follow manufacturer's recommended procedures for producing the best results, including testing substrates, moisture in substrates, and humidity and temperature limitations.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Basis of Design Products: Subject to compliance with requirements, provide Sherwin-Williams Company (The) products indicated; www.sherwin-williams.com/#sle.
- B. Comparable Products: Products of approved manufacturers will be considered in accordance with 016000 - Product Requirements, and the following:

2.02 PAINTINGS AND COATINGS

- A. General:
 - 1. Provide factory-mixed coatings unless otherwise indicated.

2. Do not reduce, thin, or dilute coatings or add materials to coatings unless specifically indicated in manufacturer's instructions.
- B. Accessory Materials: Provide primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials as required for final completion of painted surfaces.

2.03 Paint Systems - Exterior

- A. Metal, Miscellaneous: Iron, ornamental iron, structural iron and steel, ferrous metal.
 1. Alkyd Systems, Water-Based:
 - a. Semi-Gloss Finish:
 - 1) 1st Coat: Sherwin-Williams Pro Industrial Pro-Cryl Universal Primer, B66-1310 Series: www.sherwin-williams.com/#sle.
 - (a) 5 mils wet, 2 mils dry per coat.
 - 2) 2nd and 3rd Coat: Sherwin-Williams Pro Industrial Water Based Alkyd Urethane Enamel Semi-Gloss, B53-1150 Series: www.sherwin-williams.com/#sle.
 - (a) 4 to 5 mils wet, 1.4 to 1.7 mils dry per coat.

2.04 Paint Systems - INTERIOR

- A. Concrete, Walls and Ceilings: Poured concrete, precast concrete, unglazed brick, cement board, tilt-up, cast-in-place concrete, and plaster.
 1. Latex Systems:
 - a. Semi-Gloss Finish:
 - 1) 1st Coat: Sherwin-Williams Loxon Concrete and Masonry Primer Sealer, LX02W50 Series: www.sherwin-williams.com/#sle.
 - (a) 8 mils wet, 3.2 mils dry per coat.
 - 2) 2nd and 3rd Coat: Sherwin-Williams ProMar 200 Zero VOC Latex Semi-Gloss, B31-2600 Series: www.sherwin-williams.com/#sle.
 - (a) 4 mils wet, 1.5 mils dry per coat.
 2. Epoxy Systems, Water-Based:
 - a. Semi-Gloss Finish:
 - 1) 1st Coat: Sherwin-Williams Loxon Concrete and Masonry Primer Sealer, LX02W50: www.sherwin-williams.com/#sle.
 - (a) 8 mils wet, 3.2 mils dry.
 - 2) 2nd and 3rd Coat: Sherwin-Williams Pro Industrial Pre-Catalyzed Waterbased Epoxy, K46 Series: www.sherwin-williams.com/#sle.
 - (a) 4 mils wet, 1.5 mils dry per coat.
- B. Masonry CMU: Concrete, split face, scored, smooth, high density, low density, and fluted.
 1. Latex Systems:
 - a. Semi-Gloss Finish:

- 1) 1st Coat: Sherwin-Williams PrepRite Block Filler, B25W25: www.sherwin-williams.com/#sle.
- (a) 75 to 125 sq ft/gal (1.8 to 3.1 sq m/L).
- 2) 2nd and 3rd Coat: Sherwin-Williams ProMar 200 Zero VOC Latex Semi-Gloss, B31-2600 Series: www.sherwin-williams.com/#sle.
- (a) 4 mils wet, 1.5 mils dry per coat.
2. Epoxy Systems, Water-Based:
 - a. Semi-Gloss Finish:
 - 1) 1st Coat: Sherwin-Williams Loxon Block Surfacers, LX01W200: www.sherwin-williams.com/#sle.
 - (a) 50 to 100 sq ft/gal (1.2 to 2.5 sq m/L).
 - 2) 2nd and 3rd Coat: Sherwin-Williams Pro Industrial Pre-Catalyzed Waterbased Epoxy, K46 Series: www.sherwin-williams.com/#sle.
 - (a) 4 mils wet, 1.5 mils dry per coat.
- C. Metal, Galvanized: Ceilings and ductwork.
 1. Dryfall Waterborne Topcoats:
 - a. Flat Finish:
 - 1) 1st and 2nd Coat: Sherwin-Williams Pro Industrial Waterborne Acrylic Dryfall, B42-181 Series: www.sherwin-williams.com/#sle.
 - (a) 6 mils wet, 1.7 mils dry per coat.
- D. Metal: Structural steel columns, joists, trusses, beams, miscellaneous and ornamental iron, structural iron, and ferrous metal.
 1. Alkyd Systems, Water-Based:
 - a. Semi-Gloss Finish:
 - 1) 1st Coat: Sherwin-Williams Pro Industrial Pro-Cryl Universal Primer, B66-1310 Series: www.sherwin-williams.com/#sle.
 - (a) 5 mils wet, 2 mils dry per coat.
 - 2) 2nd and 3rd Coat: Sherwin-Williams Pro Industrial Water Based Alkyd Urethane Enamel Semi-Gloss, B53-1150 Series: www.sherwin-williams.com/#sle.
 - (a) 4 to 5 mils wet, 1.4 to 1.7 mils dry per coat.
 2. Dryfall Waterborne Topcoat:
 - a. Flat Finish:
 - 1) 1st Coat: Sherwin-Williams Pro Industrial Pro-Cryl Universal Primer, B66-1310 Series: www.sherwin-williams.com/#sle.
 - (a) 5 mils wet, 2 mils dry per coat.
 - 2) 2nd and 3rd Coat: Sherwin-Williams Pro Industrial Waterborne Acrylic Dryfall, B42-181 Series: www.sherwin-williams.com/#sle.
 - (a) 6 mils wet, 1.7 mils dry per coat.
 - E. Drywall: Walls, ceilings, gypsum board, and similar items.
 1. Latex Systems:

- a. Semi-Gloss Finish:
 - 1) 1st Coat: Sherwin-Williams ProMar 200 Zero VOC Interior Latex Primer, B28W2600: www.sherwin-williams.com/#sle.
 - (a) 4 mils wet, 1.5 mils dry per coat.
 - 2) 2nd and 3rd Coat: Sherwin-Williams ProMar 200 Zero VOC Latex Semi-Gloss, B31-2600 Series: www.sherwin-williams.com/#sle.
 - (a) 4 mils wet, 1.5 mils dry per coat.
- 2. Epoxy Systems, Water-Based:
 - a. Semi-Gloss Finish:
 - 1) 1st Coat: Sherwin-Williams ProMar 200 Zero VOC Interior Latex Primer, B28W2600: www.sherwin-williams.com/#sle.
 - (a) 4 mils wet, 1.5 mils dry per coat.
 - 2) 2nd and 3rd Coat: Sherwin-Williams Pro Industrial Pre-Catalyzed Waterbased Epoxy, K46 Series: www.sherwin-williams.com/#sle.
 - (a) 4 mils wet, 1.5 mils dry per coat.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that surfaces are ready to receive work as instructed by the product manufacturer.
- B. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially affect proper application.
- C. Test shop-applied primer for compatibility with subsequent cover materials.

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. Concrete:
 - 1. Remove release agents, curing compounds, efflorescence, and chalk.
 - 2. Fill bug holes, air pockets, and other voids with cement patching compound.
 - 3. Prepare concrete in accordance with SSPC-SP 13/NACE No.6.
- D. Masonry: Remove efflorescence and chalk.
- E. Gypsum Board: Fill minor defects with filler compound; sand smooth and remove dust prior to painting.
- 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. Shop-Primed Surfaces: Sand and scrape to remove loose primer and rust. Feather edges to make touch-up patches inconspicuous. Prime bare steel surfaces.
3. Remove rust, loose mill scale, and other foreign substances using methods recommended by paint manufacturer and blast cleaning in accordance with SSPC-SP 6/NACE No.3. 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.
- C. Apply coatings at spread rate required to achieve manufacturer's recommended dry film thickness.
- D. Regardless of number of coats specified, apply additional coats until complete hide is achieved.

3.04 Priming

- A. Apply primer to all surfaces unless specifically not required by coating manufacturer. Apply in accordance with coating manufacturer's instructions.
- B. Primers specified in painting schedules may be omitted on items factory primed or factory finished items if acceptable to top coat manufacturers.

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 coatings from damage until completion of project.
- B. Touch-up damaged finishes after Substantial Completion.

PAINT SCHEDULE

1. HPC-01: Sherwin Williams – SW7006 EXTRA WHITE, EPOXY
2. HPC-02: Sherwin Williams – SW XXX IRON ORE, EPOXY
3. HPC-03: Sherwin Williams – SW 6559 CONCORD GRAPE, EPOXY
4. PT-01: Sherwin Williams - SW 7006 EXTRA WHITE
5. PT-02: Sherwin Williams - SW 7006 EXTRA WHITE
6. PT-03: Sherwin Williams – SW 7069 IRON ORE

7. PT-05: Sherwin Williams - SW 6271 - EXPRESSIVE PLUM
8. PWC-01: Sherwin Williams – CUSTOM – FUTURE CUSTOM GRAPHICS

END OF SECTION

SECTION 099300 - STAINING AND TRANSPARENT FINISHING

PART 1 GENERAL

1.01 Section Includes

- A. Field application of stains.

1.02 REFERENCE STANDARDS

- A. MPI (APSM) - Master Painters Institute Architectural Painting Specification Manual; Current Edition.

1.03 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 catalog number, and general product category.
- C. Samples: Two samples on actual wood substrate to be finished, ____ by ____ inch (____ by ____ mm) in size, indicating selected colors and sheens for each system, with specified coats cascaded.
- 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 Stock Materials: Stain and transparent finish materials, 1 gal (4 L) of each color and type; store where directed.
 - a. Label each container with color and type in addition to the manufacturer's label.

1.04 Quality Assurance

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section, with at least three years of documented experience.
- B. Applicator 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 products to site in sealed and labeled containers; inspect to verify acceptability.
- B. Container Label: Include manufacturer's name, type of stain or transparent finish, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.

- C. Stain and Transparent Finish 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.

1.06 Field Conditions

- A. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by manufacturer of stains and transparent finishes.
- B. Follow manufacturer's recommended procedures for producing best results, including testing of substrates, moisture in substrates, and humidity and temperature limitations.
- C. Do not apply materials when relative humidity exceeds 85 percent, at temperatures less than 5 degrees F (3 degrees C) above the dew point, or to damp or wet surfaces.
- D. Minimum Application Temperature: 50 degrees F (10 degrees C) unless required otherwise by manufacturer's instructions.
- E. Provide lighting level of 80 fc (860 lux) measured mid-height at substrate surface.

PART 2 PRODUCTS

2.01 Manufacturers

- A. Provide finishes used in any individual system from the same manufacturer; no exceptions.
- B. Transparent Finishes:
 - 1. Sherwin-Williams Company; _____: www.sherwin-williams.com/#sle.
 - 2. _____.
 - 3. Substitutions: See Section 016000 - Product Requirements.
- C. Stains:
 - 1. Sherwin-Williams Company; _____: www.sherwin-williams.com/#sle.
 - 2. _____.
 - 3. Substitutions: See Section 016000 - Product Requirements.

2.02 Stains and Transparent Finishes - General

- A. Finishes:
 - 1. Provide finishes 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 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 finish material in quantity required to complete entire project's work from a single production run.
 - 4. Do not reduce, thin, or dilute finishes or add materials unless such procedure is specifically described in manufacturer's product instructions.

2.03 Interior Stain and Transparent Finish Systems

A. Finish on Wood - Vertical Surfaces:

1. Stain: Semi-transparent stain for wood, solvent based.
 - a. Products:
 - 1) _____.
 - 2) Substitutions: Section 016000 - Product Requirements.
2. Top Coat: Polyurethane varnish, high build.
 - a. Products:
 - 1) Sherwin-Williams MinWax High Build Polyurethane, Satin.
 - 2) _____.
 - 3) Substitutions: Section 016000 - Product Requirements.
3. Top Coat Sheen:
 - a. Satin: MPI gloss level 4; use this sheen at all locations.

2.04 Accessory Materials

- A. Accessory Materials: Cleaning agents, cleaning cloths, sanding materials, and clean-up materials as required for final completion of finished surfaces.

PART 3 EXECUTION

3.01 Examination

- A. Do not begin application of stains 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.

3.02 Preparation

- A. Clean surfaces thoroughly and correct defects prior to application.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
- C. Remove or mask surface appurtenances, including electrical plates, hardware, light fixture trim, escutcheons, and fittings, prior to preparing surfaces or finishing.
- D. Wood Surfaces to Receive Transparent Finish: Wipe off dust and grit prior to sealing, seal knots, pitch streaks, and sappy sections with sealer. Fill nail holes and cracks after sealer has dried; sand lightly between coats. Prime concealed surfaces with gloss varnish reduced 25 percent with thinner.

3.03 Application

- A. Apply products in accordance with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual".
- B. Do not apply finishes to surfaces that are not dry. Allow applied coats to dry before next coat is applied.
- C. Apply each coat to uniform appearance in thicknesses specified by manufacturer.
- D. Wood to Receive Transparent Finishes: Tint fillers to match wood. Work fillers into the grain before set. Wipe excess from surface.
- E. Reinstall items 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

SECTION 101100 - VISUAL DISPLAY UNITS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Markerboards.
- B. Tackboards
- C. Support Systems for visual display boards

1.02 REFERENCE STANDARDS

- A. ANSI A208.1 - American National Standard for Particleboard; 2022.
- B. ASTM A424/A424M - Standard Specification for Steel, Sheet, for Porcelain Enameling; 2025.

1.03 SUBMITTALS

- A. See Section 013000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide manufacturer's data on glass markerboard, tackboard, tackboard surface covering, trim, and accessories.
- C. Shop Drawings: Indicate wall elevations, dimensions, joint locations , special anchor details.

1.04 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

1.05 WARRANTY

- A. See Section 017800 - Closeout Submittals, for additional warranty requirements.
- B. Provide five year warranty for markerboard to include warranty against discoloration due to cleaning, crazing or cracking, and staining.

PART 2 PRODUCTS

2.01 PORCELAIN ENAMEL STEEL MARKERBOARDS:

- A. Manufacturers:
 - 1. Claridge Products and Equipment, Inc – Basis of Design
 - 2. Forbo
 - 3. Koroseal

- B. Particleboard Core: 1/2 inch (13 mm) thick; with 0.013-inch- (0.35-mm-) thick, galvanized-steel sheet backing.
- C. Laminating Adhesive: Manufacturer's standard, moisture-resistant thermoplastic type.

2.02 TACKBOARD ASSEMBLIES

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Claridge
 - 2. Forbo
 - 3. Koroseal
- B. Vinyl-Fabric-Faced Tackboard: Vinyl fabric factory laminated to 1/2-inch- (13-mm-) thick fiberboard backing.

2.03 MATERIAL

- A. Porcelain Enameled Steel Sheet: ASTM A424/A424M, Type I, Commercial Steel, with fired-on vitreous finish.
- B. Particleboard: ANSI A208.1; wood chips, set with waterproof resin binder, sanded faces.
- C. Foil Backing: Aluminum foil sheet, 0.005 inch thick (0.13 mm thick).

2.04 ACCESSORIES

- A. Map Rail: Extruded aluminum, manufacturer's standard profile, with cork insert and runners for accessories; 1 inch wide overall (; 25 mm wide overall) , full width of frame.
- B. Marker Tray: Aluminum, manufacturer's standard profile, one piece full length of markerboard, molded ends, concealed fasteners, same finish as frame.
- C. Mounting Brackets: Concealed.

2.05 VISUAL DISPLAY SURFACE SCHEDULE

- A. Visual Display Board: (MB) Factory assembled.
 - 1. MBD-01: Claridge – Porcelain Enamel Steel – White, Magnetic – 4'x8'
 - 2. MBD-02: Claridge – Porcelain Enamel Steel – White, Magnetic – 4'x4'
 - 3. MBD-03: Clarus – Wall2Wall – Color to Match SW 6271 – 4'x7'
 - 4. Corners: Square
 - 5. Mounting: Wall.
 - 6. Mounting Height: As directed by Architect.
 - 7. Field-Applied Aluminum Trim: Manufacturer's standard with clear anodic finish.
 - 8. Accessories:
 - a. Chalktray: Box type.
 - b. Map rail with display rail, end stops, hooks and clips and flag holder.
- B. Tackboard (TB): Factory Assembled

1. Basis of Design: Claridge
 - a. Koroseal
 - b. Forbo
2. TBD-01: Claridge – Bulletin Board – Cork 1103 Oyster/Trim Slate Gray – 36"x72"
3. TBD-02: Claridge – Bulletin Board – Cork: 1103 Oyster/Trim Slate Gray – 24"x72"
4. TBD-03: Claridge – Bulletin Board – Cork: 1103 Oyster/Trim Slate Gray – See Elevations
5. Mounting: Wall.
6. Mounting Height: As directed by Architect.
7. Edges: Concealed by trim.
 - a. Factory-Applied Aluminum Trim

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.

3.03 CLEANING

- A. Clean board surfaces in accordance with manufacturer's instructions.

END OF SECTION

SECTION 101200 - DISPLAY CASES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Recessed display cases.

1.02 RELATED REQUIREMENTS

- A. Section 092216 - Non-Structural Metal Framing: Concealed supports in metal stud walls.

1.03 SUBMITTALS

- A. See Section 013000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Submit complete printed data and installation details indicating products to be provided as specified.
- C. Shop Drawings: Submit complete installation details. Include dimensioned elevations.
- D. Samples: Submit samples of material and trim to illustrate finish, color, and texture.

1.04 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with at least three years of documented experience.

1.05 DELIVERY, STORAGE AND HANDLING

- A. Deliver display cases and materials to the Project site with manufacturer's protective crate covering and do not open until ready for use.
- B. Protect display cases before, during, and after installation. In case of damage, immediately provide necessary repairs and replacements.

1.06 FIELD CONDITIONS

- A. Field Measurements: Verify field measurements for recessed application for display cases before preparation of shop drawings and before fabrication to ensure proper installation.

1.07 WARRANTY

- A. See Section 017800 - Closeout Submittals, for additional warranty requirements.
- B. Provide five year manufacturer warranty against defects and in materials, finish product and workmanship.

PART 2 PRODUCTS

2.01 DISPLAY CASES

- A. Custom Fabricated Display Cases as detailed in drawings.
 - 1.
- B. Recessed Display Case: Factory-fabricated wood-framed display case with adjustable glass shelves, finished interior, and aluminum trim on face to cover edge of recessed opening.

2.02 COMPONENTS

- A. Wood Case Construction: 3/4 inch (19 mm) plywood with p-lam per drawings.
- B. Aluminum Framed Case Construction: extruded aluminum tube frame with tempered glass, laminate-faced, and stained veneer plywood infill panels.
- C. Aluminum Case Construction: Aluminum side, bottom, and top panels fabricated from extruded aluminum shapes.
- D. Face Frame Trim for Recessed Installation: 2 inch (51 mm) flat face dimension extruded aluminum trim mitered with corner clips and mechanical fasteners.
- E. Glazed Sliding Doors: See Details on plans for additional information.
- F. Glass Shelves: 1/4" Tempered Glass
- G. Shelf Standards and Brackets: See details on plans for additional information.
- H. Tackable Back Panel: Fabric Wrapped per DC-01 & DC-02 of the finish schedule

2.03 MATERIALS

- A. Aluminum Extrusions for Framing and Trim: Alloy as recommended by manufacturer for construction and specified finish; nominal 1/8 inch (3.2 mm) wall thickness.
- B. Plywood: Softwood plywood with veneer core, waterproof glue, 3/4 inch (19 mm) thick.

PART 3 EXECUTION

3.01 PREPARATION

- A. Rough openings, electrical pre-wiring, and final finishing are by other trades.

3.02 ADJUSTING AND CLEANING

- A. Verify that all accessories are installed as detailed for each unit.
- B. At completion of work, clean glass surfaces, back panels and trim.

3.03 CLOSEOUT ACTIVITIES

- A. See Section 017800 - Closeout Submittals, for closeout submittals.

END OF SECTION

SECTION 101419 - DIMENSIONAL LETTER SIGNAGE

PART 1 GENERAL

1.01 Section Includes

- A. Dimensional letter signage.

1.02 Submittals

- A. See Section 013000 - Administrative Requirements for submittal procedures.
- B. Product Data: Manufacturer's product literature for each type of dimensional letter sign, indicating style, font, colors, locations, and overall dimensions of each sign.
- C. Shop Drawings:
 - 1. Include dimensions, locations, elevations, materials, text and graphic layout, and attachment details.
- D. Samples: Submit one sample of each type of dimensional letter sign of size similar to that required for project, indicating sign style, font, and method of attachment.

1.03 Quality Assurance

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years of documented experience.

1.04 Delivery, Storage, and Handling

- A. Package dimensional letter signs as required to prevent damage before installation.
- B. Store under cover and elevated above grade.

PART 2 PRODUCTS

2.01 Manufacturers

- A. Dimensional Letter Signs:
 - 1. Inpro Corporation: www.inprocorp.com/#sle.
 - 2. Takeform: www.takeform.net/#sle.
 - 3. Substitutions: See Section 016000 - Product Requirements.

2.02 Dimensional Letters

- A. Applications: Building identification.
 - 1. Use individual metal letters.
 - 2. Mounting Location: Exterior as indicated on drawings.

3. Metal Letters:
 4. Material: Aluminum
 5. Thickness: Manufacturer's standard for letter size.
 6. Letter Height: As Shown on drawings
 7. Text and Typeface:
 - a. Character Font: Helvetica font..
 8. Finish: Brushed, satin.
 9. Color: As selected.
 10. Mounting: Projected mount with collars.
- B. Applications: Interior Signage
1. Use individual metal letters.
 2. Mounting Location: Interior as indicated on drawings.
 3. Metal Letters:
 4. Material: Aluminum
 5. Thickness: Manufacturer's standard for letter size.
 6. Letter Height: As Shown on drawings
 7. Text and Typeface:
 - a. Character Font: Helvetica font..
 8. Finish: Brushed, satin.
 9. Color: As selected.
 10. Mounting: Projected mount with collars.

2.03 Accessories

- A. Concealed Screws: Noncorroding metal; stainless steel, galvanized steel, chrome plated, or other.

PART 3 EXECUTION

3.01 Examination

- A. Verify that substrate surfaces are ready to receive work.
- B. Notify Architect if conditions are not suitable for installation of signs; do not proceed until conditions are satisfactory.

3.02 Installation

- A. Install in accordance with manufacturer's instructions.
- B. Install with horizontal edges level.
- C. Protect from damage until mm-dd-yyyy; repair or replace damaged items.

END OF SECTION

SECTION 101423 - PANEL SIGNAGE

PART 1 GENERAL

1.01 Section Includes

- A. Panel signage.
- B. Cast Plaque Sign.

1.02 Reference Standards

- A. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.
- B. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2017.

1.03 Submittals

- A. See Section 013000 - Administrative Requirements for submittal procedures.
- B. Product Data: Manufacturer's product literature for each type of panel sign, indicating styles, font, foreground and background colors, locations, and overall dimensions of each sign.
- C. Shop Drawings:
 - 1. Include dimensions, locations, elevations, materials, text and graphic layout, attachment details, and schedules.
 - 2. Schedule: Provide information sufficient to completely define each panel sign for fabrication, including room number, room name, other text to be applied, sign and letter sizes, fonts, and colors.
 - a. When room numbers to appear on signs differ from those on drawings, include the drawing room number on schedule.
 - b. 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.
 - c. Submit for approval by Owner through Architect prior to fabrication.
- D. Verification Samples: Submit samples showing colors, materials, and finishes specified.
- E. Manufacturer's qualification statement.

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.
- B. Package room and door signs in sequential order of installation, labeled by floor or building.

- C. Store tape adhesive at normal room temperature.

PART 2 PRODUCTS

2.01 Manufacturers

A. Panel Signage:

1. Best Sign Systems, Inc: www.bestsigns.com/#sle.
2. FASTSIGNS International, Inc: www.fastsigns.com/#sle.
3. Inpro Corporation: www.inprocorp.com/#sle.
4. Mohawk Sign Systems, Inc: www.mohawksign.com/#sle.
5. Seton Identification Products: www.seton.com/aec/#sle.
6. Takeform: www.takeform.net/#sle.
7. Vista System LLC: www.vistasystem.com/#sle.
8. Substitutions: See Section 016000 - Product Requirements.

2.02 Regulatory Requirements

- A. Accessibility Requirements: Comply with ADA Standards and ICC A117.1 and applicable building codes, unless otherwise indicated; in the event of conflicting requirements, comply with the most restrictive requirements.

2.03 Panel Signage

A. Typical Interior Signage:

1. Application: Room and door signs.
2. Description: Flat signs with engraved panel media, tactile characters.
3. Sign Size: See Drawing Schedule.
4. Total Thickness: 1/8 inch (3 mm).
5. Color and Font, unless otherwise indicated:
 - a. Character Font: Helvetica
 - b. Character Case: As scheduled.
 - c. Background Color: As scheduled.
 - d. Character Color: As scheduled.
6. Material: Laminated colored plastic engraved.
7. Profile: Flat panel.
8. Tactile Letters: Raised 1/32 inch minimum.
9. Braille: Grade II, ADA-compliant.

2.04 Cast Plaque Sign

A. Dedication Signage.

1. Application: Dedication Plaque at Front of Building
2. Description: Flat signs with engraved panel media, tactile characters.
3. Sign Size: See Drawing Schedule.
4. Color and Font, unless otherwise indicated:

- a. Character Font: As Scheduled.
- b. Character Case: As scheduled.
- c. Background Color: As scheduled.
- d. Character Color: As schedulesd.

2.05 SIGNAGE SCHEDULE

- A. See drawings for Signage Schedule

2.06 Accessories

- A. Concealed Screws: Noncorroding metal; stainless steel, galvanized steel, chrome plated, or other.
- B. Tape Adhesive: Double-sided tape, permanent adhesive.

PART 3 EXECUTION

3.01 Examination

- A. Verify that substrate surfaces are ready to receive work.
- B. Notify Architect if conditions are not suitable for installation of signs; do not proceed until conditions are satisfactory.

3.02 Installation

- A. Install in accordance with manufacturer's instructions.
- B. Install with horizontal edges level.
- C. Locate panel signs and mount at heights indicated on drawings and in accordance with ADA Standards and ICC A117.1.
- D. Protect from damage until final completion; repair or replace damaged items.

END OF SECTION

SECTION 102113.19 - PLASTIC TOILET COMPARTMENTS

PART 1 GENERAL

1.01 Section Includes

- A. Solid plastic toilet compartments.

1.02 Related Requirements

- A. Section 102800 - Toilet, Bath, and Laundry Accessories.

1.03 Submittals

- A. See Section 013000 - 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, floor, and ceiling supports, and door swings.
- D. Samples: Two sample blocks, 6 by 6 inches (152 by 152 mm) in size, illustrating partition panel finish, color, and sheen.

1.04 Quality Assurance

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with minimum 3 years of documented experience.

1.05 Delivery, Storage, And Handling

- A. See Section 017419 - Construction Waste Management and Disposal for packaging waste requirements.
- B. Do not deliver materials or begin installation until building is enclosed, with complete protection from outside weather, and building temperature maintained at minimum of 60 degrees F (15.6 degrees C).
- C. Do not store where ambient temperature exceeds 120 degrees F (49 degrees C).

1.06 Field Conditions

- A. Ambient Conditions: Maintain environmental conditions, such as 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 017800 - Closeout Submittals for additional warranty requirements.
- B. Manufacturer Warranty: Provide 10-year manufacturer warranty for material against breakage, corrosion, and delamination. Complete forms in Owner's name and register with manufacturer.

PART 2 PRODUCTS

2.01 Manufacturers

- A. Solid Plastic Toilet Compartments:
 - 1. All American Metal Corp - AAMCO: www.allamericanmetal.com/#sle.
 - 2. ASI Accurate Partitions: www.asi-accuratepartitions.com/#sle.
 - 3. ASI Global Partitions: www.asi-globalpartitions.com/#sle. Basis of Design: Aged Ash
 - 4. Partition Systems International of South Carolina;

2.02 Design Criteria

- A. Accessibility: Comply with ICC A117.1 and ADA Standards.

2.03 Solid Plastic Toilet Compartments

- A. General Description: Factory-fabricated doors, pilasters, and divider panels made of solid, molded, high-density polyethylene (HDPE); floor and ceiling anchored.
- B. Color: As selected by Architect.
- C. Doors:
 - 1. Thickness: 1 inch (25 mm).
 - 2. Width: 24 inches (610 mm).
 - 3. Width for Handicapped Use: 36 inches (915 mm), outswinging.
 - 4. Height: 55 inches (1397 mm).
- D. Panels:
 - 1. Thickness: 1 inch (25 mm).
 - 2. Height: 55 inches (1397 mm).
- E. Pilasters:
 - 1. Thickness: 1 inch (25 mm).
 - 2. Width: As required to fit space; minimum 3 inches (76 mm).
- F. Urinal Screens: Without doors; to match compartments; mounted to wall with two panel brackets with vertical support or bracing same as compartments.

2.04 Fabrication

- A. Fabricate toilet compartment components to sizes indicated in shop drawings.
- B. Coordinate requirements and provide cutouts for through-partition toilet accessories.

- C. Provide shoes and caps at pilasters and posts to conceal anchorage, supports, and leveling mechanisms.
- D. Provide manufacturer's standard corrosion-resistant supports, leveling mechanisms, anchors, and anchoring assemblies for pilasters and posts.
- E. Floor-Anchored, Overhead-Braced Units: Provide supports, leveling mechanisms, and anchors at pilasters to suit floor conditions.
- F. Floor-and-Ceiling-Anchored Units: Provide anchoring assemblies with leveling adjustment at tops and bottoms of pilasters.

2.05 Materials

- A. Aluminum Castings: ASTM B26/B26M.
- B. Aluminum Extrusions: ASTM B221 (ASTM B221M).
- C. High-Density Polyethylene (HDPE):
 - 1. Composition: Formed from waterproof, nonabsorbent, HDPE resins.
 - 2. Properties: Mark-resistant, self-lubricating surface.
 - 3. Material Fire Ratings: ICC (IBC), Class B.
- D. Stainless Steel Sheet, Plate, and Bar: ASTM A240/A240M or ASTM A666/A666M, Type 304, stretcher-leveled standard of flatness.
- E. Stainless Steel Castings: ASTM A743/A743M.

2.06 Accessories

- A. Pilaster Shoes: Stainless steel, satin finish, 3 inches (76 mm) high; concealing floor fastenings.
- B. Wall and Pilaster Brackets: Stainless steel; continuous type.
- C. Attachments, Screws, and Bolts: Stainless steel, tamper-proof type.
- D. Hinges: Stainless steel, manufacturer's standard finish.
 - 1. Continuous-type hinge, self-closing.
- E. Door Hardware: Stainless steel, manufacturer's standard finish.
 - 1. Door Latch: Slide type with exterior emergency access feature.

PART 3 EXECUTION

3.01 Examination

- A. Verify dimensions, tolerances, and interfaces with other work.
- B. Verify actual locations of toilet fixtures, walls, columns, ceilings, and other construction contiguous with toilet compartments by field measurements before fabrication.
- C. Verify location of built-in framing, anchorage, and bracing.
- D. Verify substrate and site conditions for product installation are installed in accordance with manufacturer's written instructions.

3.02 Installation

- A. Install partitions secure, rigid, plumb, and level in accordance with manufacturer's written instructions.
- B. Maintain 3/8-to-1/2-inch (10 to 12 mm) space between wall and panels and between wall and end pilasters.
- C. Attach panel brackets securely to walls using anchor devices.
- D. Attach panels and pilasters to brackets. Locate headrail joints at pilaster center lines.
- E. Replace damaged or scratched materials with new materials. Do not touch up scratches or damaged finish in field.

3.03 Tolerances

- A. Maximum Variation from True Position: 1/4 inch (6 mm).
- B. Maximum Variation from Plumb: 1/8 inch (3 mm).

3.04 Adjusting

- A. Adjust and align hardware to uniform clearance at vertical edge of doors, not exceeding 3/16 inch (5 mm).

END OF SECTION

SECTION 102123 - CUBICLE CURTAINS AND TRACK

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Surface mounted overhead curtain track and guides.
- B. Cubicle curtains.

1.02 RELATED REQUIREMENTS

- A. Section 011000 - Summary: Owner-installed curtains.
- B. Section 095100 - Acoustical Ceilings: Suspended ceiling system to support track.

1.03 REFERENCE STANDARDS

- A. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2024.
- B. NFPA 701 - Standard Methods of Fire Tests for Flame Propagation of Textiles and Films; 2023, with Errata.

1.04 SUBMITTALS

- A. See Section 013000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data for curtain fabric characteristics.
- C. Shop Drawings: Indicate a reflected ceiling plan view of curtain track, hangers and suspension points, attachment details, schedule of curtain sizes.
- D. Samples: Submit 12 by 12 inch (300 by 300 mm) sample patch of curtain cloth with representative top, bottom, and edge hem stitch detail, heading with reinforcement and carrier attachment to curtain header.
- E. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
 - 1. See Section 016000 - Product Requirements, for additional provisions.
 - 2. Extra Curtains: Two of each type and size.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Accept curtain materials on site and inspect for damage.
- B. Store curtain materials on site and deliver to Owner for installation when requested.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Cubicle Track and Curtains:

1. Inpro: www.inprocorp.com/#sle.
2. Tana Tex – Integral Mesh Fabric – Horizon – Feldspar: Basis of Design.
3. Substitutions: See Section 016000 - Product Requirements.

2.02 TRACKS AND TRACK COMPONENTS

A. Tracks: Extruded aluminum sections; one piece per track run.

1. Profile: Channel.
2. Mounting: Surface.
3. Track End Stop: To fit track section.
4. Finish on Exposed Surfaces: Clear anodized.

B. Curtain Carriers: Nylon rollers, size and type compatible with track; designed to eliminate bind when curtain is pulled; fitted to curtain to prevent accidental curtain removal.

C. Installation Accessories: Types required for specified mounting method and substrate conditions.

2.03 CURTAINS

A. Cubicle Curtains:

1. Material: Close weave polyester; anti-bacterial, self deodorizing, sanitized, and preshrunk.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that surfaces and supports above ceiling are ready to receive work of this Section.
- B. Verify that field measurements are as indicated.

3.02 INSTALLATION

- A. Install curtain track to be secure, rigid, and true to ceiling line.
- B. Secure track to ceiling system.
- C. Install end cap and stop device.
- D. Install curtains on carriers ensuring smooth operation.

END OF SECTION

SECTION 102239 - FOLDING PANEL PARTITIONS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Top-supported folding panel partitions, horizontal opening.

1.02 RELATED REQUIREMENTS

1.03 REFERENCE STANDARDS

- A. ASTM C1396/C1396M - Standard Specification for Gypsum Board; 2024.
- B. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements; 2023.
- C. ASTM E413 - Classification for Rating Sound Insulation; 2022.
- D. ASTM E557 - Standard Guide for Architectural Design and Installation Practices for Sound Isolation Between Spaces Separated by Operable Partitions; 2012 (Reapproved 2020).
- E. ASTM F793/F793M - Standard Classification of Wall Coverings and Ceiling Coverings by Use Characteristics; 2025.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Preinstallation Meeting: Convene at project site seven calendar days prior to scheduled beginning of construction activities of this section to review section requirements.

1.05 SUBMITTALS

- A. See Section 013000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on partition materials, operation, hardware and accessories, electric operating components, track switching components, and colors and finishes available.
- C. Design Data: Design calculations, bearing seal and signature of structural engineer licensed to practice in the State in which the Project is located, showing loads at points of attachment to the building structure.
- D. Shop Drawings: Indicate opening sizes, track layout, details of track and required supports, static and dynamic loads, location and details of pass door and frame, adjacent construction and finish trim, and stacking depth.
- E. Samples for Selection: Submit two samples of full manufacturer's color range for selection of colors.

- F. Samples for Review: Submit two samples of surface finish, 12 by 12 inches (300 by 300 mm) size, illustrating quality, colors selected, texture, and weight.
- G. Maintenance Data: Include recommended cleaning methods, cleaning materials, and stain removal methods. Describe cleaning materials detrimental to finish surfaces and hardware finish.

1.06 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified this section with minimum three years of documented experience.
- B. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years of documented experience.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's unopened packaging until installation.

1.08 WARRANTY

- A. See Section 017800 - Closeout Submittals, for additional warranty requirements.
- B. Correct defective Work within 20 year period after Date of Substantial Completion.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Folding Panel Partitions - Horizontal Opening:
 - 1. Modernfold, a DORMA Group Company Acousti-Seal Encore - Paired Panel (932) manually operated paired panel operable partition: www.modernfold.com/#sle.
 - 2. Substitutions: See Section 016000 - Product Requirements.

2.02 FOLDING PANEL PARTITIONS - HORIZONTAL OPENING

- A. Folding Panel Partitions: Center opening; paired panels; side stacking; motor operated.
- B. Panel Construction:
 - 1. Frame: 16 gauge, thick formed sheet steel frame top, bottom, jambs, and intermediates; welded construction, with acoustical insulation fill.
 - 2. Substrate: Gypsum board.
- C. Panel Finishes:
 - 1. Facing: Full height steel markerboard work surface.
- D. Panel Seals:
 - 1. Panel to Panel Seals: Grooved and gasketed astragals, with continuous flexible ribbed vinyl seal fitted to panel edge construction; color to match panel finish.

2. Acoustic Seals: Flexible acoustic seals at jambs, meeting mullions, ceilings, retractable floor and ceiling seals, and above track to structure acoustic seal.
- E. Suspension System:
 1. Track: Formed steel; 1-1/4 by 1-1/4 inch (32 by 32 mm) size; thickness and profile designed to support loads, steel sub-channel and track connectors, and track switches.
 2. Carriers: Nylon wheels on trolley carrier at top of every second panel, sized to carry imposed loads, with threaded pendant bolt for vertical adjustment.
- F. Performance:
 1. Acoustic Performance:
 - a. Sound Transmission Class (STC): 56 calculated in accordance with ASTM E413, based on tests conducted in accordance with ASTM E90, on panel size of 100 sq ft (9.3 sq m).
 2. Installed partition system track capable of supporting imposed loads, with maximum deflection of 1/360 of span.
- G. Accessories:
 1. Pass Door: Single door, 36 inch (____ mm) wide by 84 inch (____ mm) high opening; same design and construction as panel; fit door with perimeter acoustic gaskets, concealed closer, keyed lock, and tool operated floor seal.
 2. Acoustic Sealant: As recommended by partition manufacturer.

2.03 MATERIALS

- A. Markerboard: White enamel on steel, bonded to the face of the panel with horizontal trim without exposed fasteners. Trim is not acceptable on vertical edges to provide uninterrupted work surface.
- B. Acoustic Insulation:
 1. Type: As required for acoustic performance indicated.
 2. Thickness: As required for acoustic performance indicated.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that field measurements are as indicated.
- B. Verify track supports are laterally braced and will permit track to be level within 1/4 inch (6.4 mm) of required position and parallel to the floor surface.

3.02 INSTALLATION

- A. Install partition in accordance with manufacturer's instructions and ASTM E557.
- B. Install acoustic sealant to achieve required acoustic performance.
- C. Coordinate electrical connections.

3.03 ADJUSTING

- A. Adjust partition assembly to provide smooth operation from stacked to full open position. Do not over-compress acoustic seals.
- B. Visually inspect partition in full extended position for light leaks to identify a potential acoustical leak.
- C. Adjust partition assembly to achieve lightproof seal.

3.04 CLEANING

- A. Clean finish surfaces and partition accessories.

3.05 CLOSEOUT ACTIVITIES

- A. Demonstrate operation of partition and identify potential operational problems.

END OF SECTION

SECTION 102800 - 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 REFERENCE STANDARDS

- A. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.
- B. ASTM C1036 - Standard Specification for Flat Glass; 2025.
- C. ASTM C1503 - Standard Specification for Silvered Flat Glass Mirror; 2024.
- D. ASTM F2285 - Standard Consumer Safety Performance Specification for Diaper Changing Tables for Commercial Use; 2022.

1.03 SUBMITTALS

- A. See Section 013000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Submit data on accessories describing size, finish, details of function, and attachment methods.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Commercial Toilet, Shower, and Bath Accessories:
 - 1. American Specialties, Inc: www.americanspecialties.com/#sle.
 - 2. Bradley Corporation: www.bradleycorp.com/#sle.
 - 3. Georgia-Pacific Professional: www.gppro.com/#sle.
 - 4. Kimberly-Clark Corporation; Kimberly-Clark Professional ICON Collection: www.kcprofessional.com/#sle.
 - 5. Palmer Fixture: www.palmerfixture.com/#sle.
 - 6. Tork (District Standard).
 - 7. Substitutions: Section 016000 - Product Requirements.
- B. Diaper Changing Stations:
 - 1. American Specialties, Inc: www.americanspecialties.com/#sle.
 - 2. Bradley Corporation: www.bradleycorp.com/#sle.
 - 3. Diaper Deck & Company: www.diaperdeck.com/#sle.
 - 4. Foundations Worldwide, Inc: www.foundations.com/#sle.

5. Koala Kare Products: www.koalabear.com/#sle.
 6. Saniflow Hand Dryer Corporation: www.saniflowcorp.com/#sle.
 7. Safe-Strap Company, Inc: www.diaperdepot.com/#sle.
 8. Substitutions: 016000 - Product Requirements.
- C. Provide products of each category type by single manufacturer.

2.02 MATERIALS

- A. Accessories - General: Shop assembled, free of dents and scratches and packaged complete with anchors and fittings, steel anchor plates, adapters, and anchor components for installation.
1. Grind welded joints smooth.
 2. Fabricate units made of metal sheet of seamless sheets with flat surfaces.
- B. Keys: Provide 2 keys for each accessory to Owner; master key lockable accessories.
- C. Mirror Glass: Annealed float glass, ASTM C1036 Type I, Class 1, Quality Q2, with silvering, protective and physical characteristics complying with ASTM C1503.

2.03 Commercial Toilet Accessories

- A. Toilet Paper Dispenser: Double roll, surface mounted, for cored or coreless type rolls.
1. Products:
 - a. American Specialties, Inc: www.americanspecialties.com/#sle.
 - b. Kimberly-Clark Corporation: www.kcprofessional.com/#sle.
 - c. Palmer Fixture; RD0057 – Premium Twin 9 inch Jumbo Tissue: www.palmerfixture.com/#sle.
 - d. Tork (56TR) - District Standard.
 - e. Substitutions: Section 016000 - Product Requirements.
- B. Paper Towel Dispenser: Manual, roll paper type.
1. Material: Thermoplastic polymer.
 2. Paper Discharge: Manual dispense by lever operation.
 3. Capacity: 8-inch diameter roll.
 4. Mounting: Surface mounted.
 5. Refill Indicator: Transparent viewing slot.
 6. Products:
 - a. Tork 77282 - District Standard.
 - b. Substitutions: Section 016000 - Product Requirements.
- C. Soap Dispenser: Liquid soap dispenser, wall-mounted, surface,
1. Products:
 - a. Foamy IQ - District Standard.
 - b. Substitutions: Section 016000 - Product Requirements.
- D. Mirrors: Stainless steel framed, 1/4 inch (6 mm) thick annealed float glass; ASTM C1036.
1. Annealed Float Glass: Silvering, protective and physical characteristics in compliance with ASTM C1503.
 2. Size: As indicated on drawings.
 3. Frame: 0.05 inch (1.3 mm) angle shapes, with mitered and welded and ground corners, and tamperproof hanging system; satin finish.

4. Backing: Full-mirror sized, minimum 0.03 inch (0.8 mm) galvanized steel sheet and nonabsorptive filler material.
5. Products:
 - a. American Specialties, Inc: www.americanspecialties.com/#sle.
 - b. Substitutions: Section 016000 - Product Requirements.
- E. Grab Bars: Stainless steel, smooth surface.
 1. Standard Duty Grab Bars:
 - a. Push/Pull Point Load: 250 pound-force (1112 N), minimum.
 - b. Dimensions: 1-1/4 inch (32 mm) outside diameter, minimum 0.05 inch (1.3 mm) wall thickness, exposed flange mounting, 1-1/2 inch (38 mm) clearance between wall and inside of grab bar.
 - c. Finish: Satin.
 - d. Length and Configuration: As indicated on drawings.
 - e. Products:
 - 1) American Specialties, Inc: www.americanspecialties.com/#sle.
 - 2) PROFLO: www.ferguson.com/#sle.
 - 3) Seachrome Corporation: www.seachrome.com/#sle.
 - 4) Standard Metal Hardware Manufacturing, Ltd: www.smhardware.com/#sle.
 - 5) Substitutions: Section 016000 - Product Requirements.
- F. Sanitary Napkin Disposal Unit: Stainless steel, surface-mounted, self-closing door, locking bottom panel with full-length stainless-steel piano-type hinge, removable receptacle.
 1. Products:
 - a. Substitutions: Section 016000 - Product Requirements.

2.04 Commercial Shower and Bath Accessories

- A. Shower Curtain Rod: Stainless steel tube, 1 inch (25 mm) outside diameter, 0.04 inch (1.0 mm) wall thickness, satin-finished, with 3 inch (75 mm) outside diameter, minimum 0.04 inch (1.0 mm) thick satin-finished stainless-steel flanges, for installation with exposed fasteners.
 1. Products:
 - a. American Specialties, Inc: www.americanspecialties.com/#sle.
 - b. Substitutions: Section 016000 - Product Requirements.
- B. Shower Curtain:
 1. Material: Opaque vinyl, 0.008 inch (0.2 mm) thick, matte finish, with antibacterial treatment, flameproof and stain-resistant.
 2. Grommets: Stainless steel; pierced through top hem on 6 inch (150 mm) centers.
- C. Folding Shower Seat: Wall-mounted surface; welded tubular seat frame, structural support members, swing-down legs, hinges, and mechanical fasteners of Type 304 stainless steel, L-shaped, right-hand seat.
 1. Seat: Phenolic or polymeric composite one-piece seat or seat slats, of white color.
 2. Size: ADA Standards compliant.
 3. Products:
 - a. Seachrome Corporation; Accessibility Seats, L-Shaped Transfer with Swing-down Legs, Reversible: www.seachrome.com/#sle.

- b. Substitutions: Section 016000 - Product Requirements.
- D. Towel Pin: Stainless steel, 3 inch (75 mm) extension from wall; rectangular-shaped bracket and backplate for concealed attachment, satin finish.
 - 1. Products:
 - a. Substitutions: Section 016000 - Product Requirements.
- E. Robe Hook: Heavy-duty stainless steel, single-prong, rectangular-shaped bracket and backplate for concealed attachment, satin finish.
 - 1. Products:
 - a. Substitutions: Section 016000 - Product Requirements.

2.05 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 (113.4 kg).
 - 5. Products:
 - a. Foundations Worldwide, Inc; Origin Horizontal Recessed Changing Station with Flange: www.foundations.com/#sle.
 - b. Rubbermaid Commercial Products; FG781988 Baby Changing Station Vertical: www.rubbermaidcommercial.com/#sle.
 - c. Saniflow Hand Dryer Corporation; Babymedi Horizontal: www.saniflowcorp.com/#sle.
 - d. Substitutions: 016000 - Product Requirements.

2.06 Utility Room Accessories

- A. Combination Utility Shelf/Mop and Broom Holder: 0.05 inch (1.3 mm) thick stainless steel, Type 304, with 1/2 inch (12 mm) returned edges, 0.06 inch (1.6 mm) steel wall brackets.
 - 1. Drying rod: Stainless steel, 1/4 inch (6 mm) diameter.
 - 2. Hooks: Two, 0.06 inch (1.6 mm) stainless steel rag hooks at shelf front.
 - 3. Mop/broom holders: Three spring-loaded rubber cam holders at shelf front.
 - 4. Length: 36 inches (900 mm).
 - 5. Products:
 - a. American Specialties, Inc: www.americanspecialties.com/#sle.
 - b. Substitutions: 016000 - Product Requirements.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Verify exact location of accessories for installation.

- C. For electrically-operated accessories, verify that electrical power connections are ready and in the correct locations.

3.02 PREPARATION

- A. 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.

3.04 PROTECTION

- A. Protect installed accessories from damage due to subsequent construction operations.

END OF SECTION

SECTION 104400 - FIRE PROTECTION SPECIALTIES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Fire extinguishers.
- B. Fire extinguisher cabinets.
- C. Accessories.

1.02 REFERENCE STANDARDS

- A. ASTM E814 - Standard Test Method for Fire Tests of Penetration Firestop Systems; 2024.
- B. NFPA 10 - Standard for Portable Fire Extinguishers; 2022.

1.03 SUBMITTALS

- A. See Section 013000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide extinguisher operational features.
- C. Shop Drawings: Indicate locations of cabinets and cabinet physical dimensions.

1.04 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. Activar Construction Products Group, Inc. - JL Industries; Cosmic Extinguisher - Multipurpose Chemical: www.activarcpg.com/#sle.
 - 2. Ansul, a Tyco Business; ____: www.ansul.com/#sle.
 - 3. Fire-End & Croker Corporation: www.croker.com/#sle.
 - 4. Kidde, a unit of United Technologies Corp; ____: www.kidde.com/#sle.
 - 5. Oval Brand Fire Products; Oval Dry Chemical Fire Extinguisher - Multipurpose ABC: www.ovalfireproducts.com/#sle.
 - 6. Potter-Roemer; ____: www.potterroemer.com/#sle.
 - 7. Pyro-Chem, a Tyco Business; ____: www.pyrochem.com/#sle.
 - 8. Substitutions: See Section 016000 - Product Requirements.
- B. Fire Extinguisher Cabinets and Accessories:
 - 1. Activar Construction Products Group, Inc. - JL Industries; Ambassador Series: www.activarcpg.com/#sle.

2. Fire-End & Croker Corporation: www.croker.com/#sle.
3. Kidde, a unit of United Technologies Corp; _____: www.kidde.com/#sle.
4. Larsen's Manufacturing Co; _____: www.larsensmfg.com/#sle.
5. Oval Brand Fire Products; Cabinets for Low Profile Extinguishers: www.ovalfireproducts.com/#sle.
6. The Williams Brothers Corporation of America; Classic Economy Series: www.wbdoors.com/#sle.
7. Substitutions: See Section 016000 - Product Requirements.

2.02 FIRE EXTINGUISHERS

- A. Fire Extinguishers - General: Comply with product requirements of NFPA 10 and applicable codes, whichever is more stringent.
- B. Multipurpose Dry Chemical Type Fire Extinguishers: Carbon steel tank, with pressure gauge.
 1. Cartridge Operated: Spun shell.
 2. Stored Pressure Operated: Deep Drawn.
 3. Class: A:B:C type.
 4. Size: 20 pound (9.1 kg).
 5. Finish: Baked polyester powder coat, _____ color.
 6. Temperature range: Minus 65 degrees F (Minus 54 degrees C) to ____ degrees F (____ degrees C).
- C. Dry Chemical Type Fire Extinguishers: Stainless steel tank, with pressure gauge.
 1. Class: K type.
 2. Size: 1.6 gallons (6 L).
 3. Size and classification as scheduled.
 4. Temperature range: Minus 20 degrees F (Minus 29 degrees C) to 120 degrees F (49 degrees C).

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.
- C. Fire Rated Cabinet Construction: One-hour fire rated.
- D. Cabinet Configuration: Surface mounted type.
 1. Size to accommodate accessories.
- E. Door: 0.036 inch (0.9 mm) metal thickness, reinforced for flatness and rigidity with nylon catch. Hinge doors for 180 degree opening with two butt hinges.
- F. Door Glazing: Float glass, clear, 1/8 inch (3 mm) thick, and set in resilient channel glazing gasket.
- G. Cabinet Mounting Hardware: Appropriate to cabinet, with pre-drilled holes for placement of anchors.
- H. Fabrication: Weld, fill, and grind components smooth.
- I. Finish of Cabinet Exterior Trim and Door: No.4 - Brushed stainless steel.

- J. Finish of Cabinet Interior: White colored enamel.

2.04 ACCESSORIES

- A. Lettering: "FIRE EXTINGUISHER" decal, or vinyl self-adhering, prespaced black lettering in accordance with authorities having jurisdiction (AHJ).

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify rough openings for cabinet are correctly sized and located.

3.02 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install cabinets plumb and level in wall openings, ____ inches (____ mm) from finished floor to inside bottom of cabinet.
- C. Secure rigidly in place.

END OF SECTION

SECTION 105113 - METAL LOCKERS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Metal lockers.

1.02 RELATED REQUIREMENTS

- A. Section 033000 - Cast-in-Place Concrete: Concrete base construction.

1.03 REFERENCE STANDARDS

- A. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.
- B. 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; 2024.
- C. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2017.

1.04 SUBMITTALS

- A. See Section 013000 - Administrative Requirements for submittal procedures.
- B. Product Data: Manufacturer's published data on locker construction, sizes, and accessories.
- C. Shop Drawings: Indicate locker plan layout, numbering plan and combination lock code.
- D. Samples: Submit two samples ___ by ___ inches (___ by ___ mm) in size showing color and finish of metal locker material.

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: www.artmetalproducts.com/#sle.
 - 2. ASI Storage SolutionsPro Collection: www.asi-storage.com/#sle.
 - 3. DeBourgh Manufacturing Co: www.debourgh.com/#sle. – Basis of Design
 - 4. Substitutions: See Section 016000 - Product Requirements.

2.02 LOCKER APPLICATIONS

- A. PE Metal lockers, with matching closed base.
 - 1. Width: 12 inches (305 mm).
 - 2. Depth: 12 inches (305 mm).
 - 3. Height: 72 inches (1830 mm).
 - 4. Configuration: Three tier.
 - 5. Fittings: Size and configuration as indicated on drawings.
 - a. Hooks: Two single prong.
 - 6. Ventilation: Louvers at top and bottom of door panel.
 - 7. Locking: Padlock hasps, for padlocks provided by Owner.
 - 8. Provide sloped top.
 - 9. Color: Smoke.
- B. Athletic Lockers: Metal lockers, mounted on base indicated on drawings.
 - 1. Width: 18 inches (457 mm).
 - 2. Depth: 18 inches (457 mm).
 - 3. Height: 4'-9"
 - 4. Configuration: Double tier.
 - 5. Fittings: Size and configuration as indicated on drawings.
 - a. Upper shelf.
 - b. Coat rod.
 - c. Hooks: One single prong.
 - 6. Ventilation: Louvers at top and bottom of door panel.
 - 7. Locking: Padlock hasps, for padlocks provided by Owner.
 - 8. Provide sloped top.
 - 9. Color: Smoke.
- C. LT-01 through LT-05
 - 1. Width: Shown on Drawings
 - 2. Depth: Shown on Drawings.
 - 3. Height: Shown on Drawings.
 - 4. Configuration: Shown on Drawings.
 - 5. Color: Smoke.

2.03 METAL LOCKERS

- A. Accessibility: Design units indicated on drawings as 'accessible' to comply with ICC A117.1 and ADA Standards.
- B. Locker Case Construction:
 - 1. Heavy-Duty, Welded Construction: Made of formed and welded together sheet steel; metal edges finished smooth without burrs; baked enamel or powder coat finished inside and out.
 - a. Assembly: Do not use bolts, screws, or rivets to assemble locker bodies.
 - b. Locker Body Components: Formed and flanged from steel sheet of the following type and minimum thicknesses:

- 1) Unperforated Steel Sheet: Commercial Steel (CS), Type B, supplied for exposed applications and complying with ASTM A1008/A1008M and the following:
 - 2) Body and Shelves: 16 gauge, 0.0598 inch (1.52 mm).
 - 3) Backs: 18 gauge, 0.0478 inch (1.21 mm).
- C. Doors: Channel edge; welded construction, manufacturer's standard stiffeners, grind and finish edges smooth.
1. Door Thickness: 16 gauge, 0.0598 inch (1.52 mm), minimum.
 2. Form recess for operating handle and locking device.
- D. Latches and Door Handles: Manufacturer's standard.
1. Latching: Manufacturer's standard for locking arrangement selected.
- E. Hinges: Continuous piano hinge with powder coat finish to match locker color.
- F. Sloped Top: 20 gauge, 0.0359 inch (0.91 mm), with closed ends.
- G. Coat Hooks: Stainless steel or zinc-plated steel.
- H. Locks: Locker manufacturer's standard type indicated in Applications article above.
- I. Built-In Lock Boxes: Same material as locker, manufacturer's standard size, with padlock hasps, for padlocks provided by Owner.

2.04 Locker Room Benches

- A. Basis of Design: Debourgh Manufacturing Benches & Pedestals
1. BENCHES: Provide manufacturer's standard 1-1/4" thick x 9-1/2" wide mixed hardwood bench tops in varying lengths. Bench tops to be double-coated with a satin gloss sealer for protection on tops and sides with one coat of sealer on underside. Provide all fastening hardware.
 2. ADA BENCHES: Provide benches 24" wide x 48" long which are attached to the wall along the longer dimension with two brackets. Two heavy duty pedestals are required below the front edge of each bench top. If brackets are not provided, an acceptable alternative is to use four heavy duty pedestals (one at each corner).
 3. HEAVY DUTY PEDESTAL: Provide heavy duty, bell-shaped, cast iron pedestals. Base diameter of 8" is threaded for 1-1/2" pipe. The pedestal is secured to the floor with a 1/2" x 5" concealed concrete anchor. Overall pedestal height is 16". Ash Gray powder coat is standard with color choice available.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that prepared bases are in correct position and configuration.
- B. Verify bases and embedded anchors are properly sized.

3.02 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Place and secure on prepared base.
- C. Install lockers plumb and square.
- D. Secure lockers with anchor devices to suit substrate materials. Minimum Pullout Force: 100 pounds (445 N).
- E. Bolt adjoining locker units together to provide rigid installation.
- F. Install end panels, filler panels, and sloped tops.
- G. Install fittings if not factory installed.
- H. Replace components that do not operate smoothly.

3.03 CLEANING

- A. Clean locker interiors and exterior surfaces.

END OF SECTION

SECTION 107516 - GROUND-SET FLAGPOLES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes ground-set flagpoles made from aluminum as follows:
 - 1. At new high school building entry (west side) and built to accommodate up to two (2) 4'x6' flags.
 - 2. Manufacturer / Installer to provide delegated foundation design.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include construction details, material descriptions, dimensions of individual components and profiles, operating characteristics, fittings, accessories, and finishes for flagpoles.
 - 2. Installer to provide engineered delegated stamped foundation design for review only. If soils dictate a larger than standard foundation or a larger ground sleeve, contractor / installer is responsible for all costs associated with this design.

1.3 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For flagpoles to include in operation and maintenance manuals.

1.4 SUBSTITUTIONS

- A. Products specified herein shall be considered the Basis of Design. Substitutions for specific materials will be accepted except under the following conditions. Alternative proposals must be fully supported by necessary documentation showing compatibility/comparability with specific materials. Substitution requests must also comply with the General Conditions.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Source Limitations: Obtain flagpoles as complete units, including fittings, accessories, bases, and anchorage devices, from single source from single manufacturer.

2.2 PERFORMANCE REQUIREMENTS

- A. Structural Performance: Flagpole assemblies, including anchorages and supports, shall withstand design loads indicated within limits and under conditions indicated.
 - 1. Wind Loads: Determine according to NAAMM FP 1001. Basic wind speed for Project location is 110 mph, in three (3) second plots.

2.3 ALUMINUM FLAGPOLES

- A. Aluminum Flagpoles: Tapered flagpoles fabricated from seamless extruded tubing complying with ASTM B 241/B 241M, Alloy 6063, with a minimum wall thickness of 3/16 inch.
 - 1. Basis of Design: Eagle Mountain Flag & Flagpole
 - 2. Exposed Height:
 - a. 30'-0" - Model / SKU: FP-INT-GS-30x6x188-1-CB-SAT
 - 3. Pole Finish: See 2.6 below.
 - 4. Quantity: One (1)
- B. Metal Foundation Tube: Manufacturer's standard corrugated-steel foundation tube, 0.060-inch (1.52-mm) wall thickness with 3/16-inch (4.8-mm) steel bottom plate and support plate; 3/4-inch- (19-mm-) diameter, steel ground spike; and steel centering wedges welded together. Galvanize foundation tube after assembly. Furnish loose hardwood wedges at top of foundation tube for plumbing pole. See detail on the drawing.
- C. Manufacturer:
 - 1. Eagle Mountain Flag & Flagpole
www.emflag.com
ph: 512.847.0010 email: info@emflag.com
Quote Requests: quotes@emflag.com
 - 2. Flagpoles Etc,
www.flagpolesetc.com
ph: 888.735.5591
 - 3. Concord American Flagpole
www.concordamericanflagpole.com
ph: 800.527.3902
 - 4. Acceptable Alternates / Substitutions: See 1.4 above.

2.4 FITTINGS and ACCESSORIES

- A. Flagpole Ball: Gold anodized Heavy Duty – sized as recommended by Manufacturer for pole height specified above.
 - 1. 0.063-inch (1.6-mm) spun aluminum, finished to match flagpole.
- B. Internal Halyard, Winch System: Manually operated winch with control stop device and removable handle, stainless-steel cable halyard, and concealed revolving truck assembly with plastic-coated counterweight and sling. Furnish flush access door secured with cylinder lock. Finish truck assembly to match flagpole.

- C. Polyester flags – 4'x6' Professional grade
 - 1. United States (1)
 - 2. State of Wyoming (1)

2.5 MISCELLANEOUS MATERIALS

- A. Drainage Material: Crushed stone, or crushed or uncrushed gravel; coarse aggregate.
- B. Sand: ASTM C 33/C 33M, fine aggregate.
- C. Elastomeric Joint Sealant: Sealant complying with requirements in Section 07 92 00 "Joint Sealants."
- D. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D 1187/D 1187M.

2.6 ALUMINUM FINISHES

- A. Natural Satin Finish: AA-M32, fine, directional, medium satin polish; buff complying with AA-M20; seal aluminum surfaces with clear, hard-coat wax.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Prepare uncoated metal flagpoles that are set in foundation tubes by painting below-grade portions with a heavy coat of bituminous paint.
- B. Foundation Excavation: Excavate to neat clean lines in undisturbed soil. Remove loose soil and foreign matter from excavation and moisten earth before placing concrete. Place and compact drainage material at excavation bottom.
- C. Foundation Tube: Place foundation tube, center, and brace to prevent displacement during concreting. Place concrete. Plumb and level foundation tube and allow concrete to cure.
- D. Place concrete, as specified in Section 03 30 00 "Cast-in-Place Concrete." Compact concrete in place by using vibrators. Moist-cure exposed concrete for no fewer than seven (7) days or use non-staining curing compound.
- E. Trowel exposed concrete surfaces to a smooth, dense finish, free of trowel marks, and uniform in texture and appearance. Provide positive slope for water runoff to perimeter of concrete base.

3.2 FLAGPOLE INSTALLATION

- A. General: Install flagpole(s) where indicated in Plans and according to Manufacturer's written instructions.
- B. Foundation Tube: Place flagpole in tube, seated on bottom plate between steel centering wedges, and install hardwood wedges to secure flagpole in place. Place and compact sand in foundation tube and remove hardwood wedges. Seal top of foundation tube with a 2-inch (50-

mm) layer of elastomeric joint sealant and cover with flashing collar. See typical detail in the Drawings.

END OF SECTION

SECTION 111316 - LOADING DOCK SEALS AND SHELTERS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Compression door seals.
- B. Stationary dock shelters.

1.02 SUBMITTALS

- A. See Section 013000 - Administrative Requirements for submittal procedures.
- B. Shop Drawings: Indicate framed wall opening, dimensions and tolerances, adjacent construction and fittings required for anchorages, and anchor points.
- C. Operation Data: Provide operating instructions and identify unit limitations.
- D. Maintenance Data: Provide unit maintenance information, lubrication cycles, and spare parts manual.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Loading Dock Seals and Shelters:
 - 1. Blue Giant Equipment Corporation: www.bluegiant.com/#sle.
 - 2. Chalfant Sewing Fabricators, Inc: www.chalfantusa.com/#sle.
 - 3. Fairborn USA, Inc: www.fairbornusa.com/#sle.
 - 4. Hörmann Flexon NA, LLC: www.hormann.us/#sle.
 - 5. Rite-Hite Corp: www.ritehite.com/#sle.
 - 6. Substitutions: See Section 016000 - Product Requirements.

2.02 COMPONENTS

- A. Door Seal: Compressible construction:
 - 1. Cushion: Closed cell foam for full depth of seal; straight jambs.
 - 2. Covering Material: Vinyl impregnated waterproof nylon fabric; with supplementary high abrasion resistant wear layer, to remain flexible to minus 65 degrees F (minus 54 degrees C).
- B. Stationary Dock Shelter:
 - 1. Frame Construction (Top and Sides): Treated wood.
 - 2. Side and Top Covering Material: Vinyl impregnated waterproof nylon fabric; with supplementary high abrasion resistant wear layer, to remain flexible to minus 65 degrees F (minus 54 degrees C).
 - 3. Seams: Molded without mechanical stitching; double ply at exposed face.
- C. Fasteners: Galvanized permitting site adjustment and alignment.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that opening sizes, tolerances, and conditions are acceptable.
- B. Verify that rough-in wall opening and anchors are acceptable, correctly sized, and aligned to proper tolerances.
- C. Verify that frames installed in concrete and masonry are correctly located.
- D. Start of installation constitutes acceptance of project conditions.

3.02 INSTALLATION

- A. Install seal and shelter components in accordance with manufacturer's instructions.
- B. Set plumb and level.
- C. Attach anchors and fittings to prepared wall construction and opening frame.

3.03 ADJUSTING

- A. Adjust installed unit for smooth and balanced operation.

END OF SECTION

SECTION 111319 - STATIONARY LOADING DOCK EQUIPMENT

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Recessed loading dock levelers.

1.02 RELATED REQUIREMENTS

- A. Section 031000 - Concrete Forming and Accessories: Placement of leveler frame and safety lock frame into concrete loading dock.
- B. Section 033000 - Cast-in-Place Concrete.
- C. Section 055000 - Metal Fabrications: Curb angles at concrete pit.
- D. Section 111316 - Loading Dock Seals and Shelters.

1.03 REFERENCE STANDARDS

- A. ANSI MH30.1 - Design, Testing, and Utilization of Dock Leveling Devices; 2022.
- B. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2024.
- C. ASTM D2240 - Standard Test Method for Rubber Property--Durometer Hardness; 2015 (Reapproved 2021).
- D. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2025, with Amendment (2026).

1.04 SUBMITTALS

- A. See Section 013000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide materials and finish, installation details, roughing-in measurements, and operation of unit and safety lock device.
- C. Shop Drawings: Indicate required opening dimensions and tolerances, perimeter conditions of construction, placement dimensions of safety lock devices, and diagrams for power, signal, and control wiring.
- D. Manufacturer's Qualification Statement.
- E. Installer's Qualification Statement.
- F. Operation Data: Provide operating instructions, and identify unit limitations.
- G. Maintenance Data: Provide unit maintenance information, lubrication cycles, and spare parts manual.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with at least five years of documented experience.
- B. Welder Qualifications: Welding processes and welding operators qualified within previous 12 months in accordance with AWS D1.1/D1.1M.

1.06 FIELD CONDITIONS

- A. Existing Conditions: Field verify dimensions of construction related to stationary loading dock equipment prior to fabrication, including recessed pit dimensions, slope of inclined dock approach, dock height, and height and width of dock door openings.

1.07 WARRANTY

- A. See Section 017800 - Closeout Submittals, for additional warranty requirements.
- B. Manufacturer agrees to correct defective work within five year period from Date of Substantial Completion.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Recessed Loading Dock Levelers:
 - 1. Blue Giant Equipment Corporation: www.bluegiant.com/#sle.
 - 2. Chalfant Dock Equipment: www.chalfantusa.com/#sle.
 - 3. Hörmann Flexon NA, LLC: www.hormann.us/#sle.
 - 4. Kelley, an Assa Abloy Group company; _____: www.kelleydocksolutions.com/#sle.
 - 5. Rite-Hite CorpRHH-4000 DOCK LEVELER: www.ritehite.com/#sle.
 - 6. Substitutions: See Section 016000 - Product Requirements.

2.02 RECESSED LOADING DOCK LEVELERS

- A. Recessed Loading Dock Levelers: Provide manufacturer's standard loading dock levelers, in compliance with ANSI MH30.1 requirements, and of capacity, size, and construction as indicated, consisting of a nonslip steel platform, complete with controls, safety devices, and required accessories.
 - 1. Recessed Concrete Pit: Provide preformed concrete pit sized to fit dimensions of specified loading dock levelers.
 - a. Ensure concrete slab is reinforced as required to support dock leveler.
 - b. See Section 033000 for additional cast concrete requirements.
 - 2. Rated Capacity: Capable of supporting 30,000 lbs (13,608 kg) without permanent deflection or distortion.

3. Platform Width: As indicated on drawings.
 4. Platform Length: As indicated on drawings.
 5. Frame: Manufacturer's standard.
 6. Toe Guards: Provide open sides of dock leveler with metal toe guards, equipped for entire upper operating-range.
 7. Range of Operating: Dock levelers to compensate for height differences between truck bed and loading platform, as follows; 6 inches (152 mm) above dock level, and 6 inches (152 mm) below dock level.
 8. Automatic Vertical Compensation: Floating travel of dock leveler ramp edge extended to automatically compensate for upward and downward movement of truck bed during loading and unloading operations.
 9. Automatic Lateral Compensation: Tilting of dock leveler ramp edge extended and resting on truck bed to automatically compensate for canted truck bed up to 4 inches (102 mm) over width of ramp.
 10. Ramp Edge Operation: Manufacturer's standard mechanism that automatically extends and supports hinged ramp edge and rests on truck bed over dock leveler's working range, allows ramp edge to yield under incoming truck impact and automatically retracts ramp edge when truck departs.
- B. Hydraulic Operating System: Electric control from remote-control location, with fully hydraulic operation; electric-powered hydraulic raising and lowering of platform.
1. Electrical Power Requirements: ____ volts, three phase.
 2. Packaged Unit: Provide leveler with unitized, totally enclosed, non-ventilated electric motor, pump, manifold reservoir, and valve assembly of required size, type, and capacity for operation of dock leveler indicated.
 3. Independent Hinged Ramp Edge Operation: Provide electric-powered hydraulic raising and lowering of hinged ramp edge, controlled independent of platform raising and lowering.
- C. Construction: Fabricate loading dock leveler frame, edge and platform supports from structural and formed steel shapes, with platform and hinged edge welded to supports, chamfer edge to minimize obstructing material-handling vehicles, and ensure entire assembly is fabricated to withstand deformation during operation and storage phases of service.
1. Ramp Traffic Support: Provide support for ramp at platform level in stored position with ramp edge retracted, and means to release supports allowing ramp to descend below platform level.
 2. Ramp Maintenance Support: Provide mechanism in framework to support ramp in up position during dock leveler maintenance.
- D. Integral Molded Rubber Dock Bumpers: Fabricate from 4 inch (102 mm) thick, heavy-duty molded rubber reinforced compound; with Type A Shore durometer hardness of 80, plus or minus 5, when tested in accordance with ASTM D2240.
1. Provide two dock bumpers for each loading dock leveler, anchored to face of loading dock with expansion bolts.
 2. Profile: Manufacturer's standard.
- E. Finish: Manufacturer's standard paint applied to factory-assembled and tested loading dock levelers prior to shipment.
1. Color of Surfaces: Manufacturer's standard color.

2. Color of Toe Guards: Paint with yellow and black stripes.

2.03 MATERIALS

2.04 FINISHES

- A. Galvanizing: Hot-dip galvanize to minimum requirements of ASTM A123/A123M.
 1. Touch up abraded areas after fabrication using specified touch-up primer for galvanized surfaces.
- B. Metal Plate Platform: Hot-dip galvanized to 1.25 oz/sq ft finish (Hot-dip galvanized to 380 gm/sq m finish).
- C. Frame: Factory enameled finish.
- D. Railing: Factory enameled finish.
- E. Pit Frame: Hot-dip galvanized to 1.25 oz/sq ft finish (Hot-dip galvanized to 380 gm/sq m finish).

2.05 ACCESSORIES

- A. Loading Dock Seals and Shelters: See Section 111316.
- B. Curb Angles at Edge of Recessed Leveler Pit: 3 inch by 3 inch (76 mm by 76 mm) galvanized steel angle, 1/4 inch (6.4 mm) thick, anchored to top edge of recessed leveler pit with 1/2 inch (12.7 mm) diameter by 6 inch (152 mm) long concrete anchors welded to angle at 6 inch (152 mm) on center.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Examine loading dock equipment area for compliance with requirements for installation tolerances and other conditions related to this work.
- B. Examine rough-in for electrical systems of loading dock equipment to verify openings and locations are acceptable prior to installation of equipment.
- C. Examine walls and floors of loading dock equipment concrete pits for suitable conditions, verify that pits are plumb and square, and properly sloped back to front of loading dock for drainage.
- D. Proceed with installation after unsatisfactory conditions have been corrected.

3.02 PREPARATION

- A. Prepare loading dock equipment for size and locations as indicated, and provide anchoring devices with templates, diagrams, and installation instructions.
- B. Prepare metal curb angles along concrete edges of recessed pits with top flush with loading platform, and fit exposed ends together to form smooth hairline joints.

3.03 INSTALLATION

- A. Install loading dock leveler unit in prepared opening in accordance with manufacturer's written instructions.
 - 1. Set square and level.
 - 2. Anchor unit securely, flush with dock, and weld back of leveling dock to pit frame; touch-up welds with primer.
 - 3. Install electrical connections as required for fully operational system.

3.04 ADJUSTING

- A. Adjust installed loading dock equipment and safety devices for smooth and balanced operation, and lubricate as recommended by manufacturer.
- B. Test dock levelers for vertical travel within operating range as indicated, and adjust as necessary for proper operation.

3.05 CLEANING

- A. Clean recessed pits of debris.

3.06 CLOSEOUT ACTIVITIES

- A. See Section 017800 - Closeout Submittals, for closeout submittals.

SECTION 11 4000 - FOODSERVICE EQUIPMENT

PART 1 GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
- B. It is specifically noted that the Foodservice Consultant's work is limited to the planning and design of all CSI Section 11400 foodservice equipment and related items (as defined by the Construction Specifications Institute). This excludes the actual construction or installation of the equipment, as well as work by other divisions, including but not limited to millwork, interior design elements (furniture, bars, bar tops and dies, service stations), graphics, signage, lighting, audio/visual systems, structural elements, and all base building mechanical, electrical, and plumbing work not directly associated with Section 11400 equipment and specifically called out on the project construction documents.
- C. Prior to installation, all work shall be field verified by the Kitchen Equipment Contractor. Construction documentation shall be considered "for planning and guidance" only. Fully dimensioned and field-verified construction documents will be provided by the Kitchen Equipment Contractor as part of the submittal process.
- D. The following information is provided for reference only and may not be totally inclusive for each trade. It is the responsibility of each trade to ensure that all elements of its work that may affect the final food service equipment installation are properly addressed.
- E. No responsibility is accepted by the Architect or Consultant for the placement, relocation, or replacement of equipment by the Owner or others; nor for its utilities or structural impact on the project when such equipment is furnished by others (including the Owner) outside of this contract, or where existing equipment is reused, moved, or remains in the same location and has been designated as NIC (Not in Contract) at any time during the project.

1.02 SUMMARY

- A. This Section includes equipment for foodservice facilities indicated on the Foodservice Drawings.
 - B. Kitchen Equipment Contractor/Foodservice Equipment Contractor furnished equipment.
1. Furnishing and installation includes the work as follows, but not limited to:
- a. Furnish all labor, materials and services necessary for the assembly and setting in place of the equipment in strict compliance and in accordance with the contract documents. Coordinate requirements for wall reinforcements and special support locations.

- b. Provide stands and support for equipment requiring such. In areas requiring seismic bracing and providing special support to comply with seismic standards. (Such support shall be approved by the structural engineer.)
 - c. Cut holes; provide sleeves for pipes in equipment, for drains, electrical work, plumbing work, etc., as required for proper installation. Any base building work required to be coordinated through the Contractor.
 - d. Repair any damage to equipment or to work of other trades resulting from installation according to the methods defined in the specification section of the work that is damaged.
 - e. Remove all debris resulting from this installation, clean, repair, and adjust all equipment for operation, as well as provide an acceptance test to the Owner.
- C. Owner-Furnished Equipment: Where indicated, Owner will furnish equipment items.
- D. Related Sections include the following:
- 1. Division 03 Section "Cast-in-Place Concrete" for the following:
 - a. Equipment bases.
 - b. Requirements for slab depressions.
 - c. Insulated slabs beneath walk-in refrigeration units.
 - d. 4" (at least) curbs for roof mounted refrigeration.
 - 2. Division 05 Section "Metal Fabrications" for equipment support.
 - 3. Division 06 Section "Interior Architectural Woodwork" for custom casework and countertops.
 - 4. Division 07 Section "Roof Accessories" for roof curbs and equipment supports.
 - 5. Division 09 Section "Tiling" for floor finishes in walk-in refrigeration units.
 - 6. Division 21, 22, and 23 Sections for supply and exhaust fans; exhaust ductwork; service roughing-ins; drain traps; atmospheric vents; valves, pipes, and fittings; fire-extinguishing systems; and other materials required to complete foodservice equipment installation.
 - 7. Division 23 Section "Air Curtains" for air curtains protecting foodservice facility entranceways.
 - 8. Division 23 Section "Commercial Kitchen Hoods" for ventilation hoods.
 - 9. Division 26 Sections for connections to fire alarm systems, wiring, disconnect switches, and other electrical materials required to complete foodservice equipment installation.
- E. Foodservice Contract Documents:

1. Equipment drawings are for design intent only and shall not be used as construction/installation documents or shop details.
2. Drawings and equipment specifications are intended to complement each other. Therefore, neither should be considered complete without the other.
3. Drawings are for reference, assistance and guidance only. Drawings indicate the preferred final location of equipment. The exact final location will be dictated by the building conditions
4. Reproduction of Contract documents prepared by either the Architect or Consultant by any means will not be acceptable as Shop Drawings. Drawings submitted as original KEC drawings having the appearance of copies or modified versions of the original Contract Documents will be returned as being non-conforming to submittal requirements
5. Any party requesting electronic/editable version of YoungCaruso documents must complete the “Data Transfer Form” and follow the conditions listed in this form.

1.03 SUBMITTALS

A. Product Data for each type of product/item indicated. Include the following:

1. Manufacturer's model number.
2. Options, accessories, and components that will be included for Project.
3. Clearance requirements for access and maintenance.
4. Utility service connections for water, drainage, power, and fuel; include roughing-in dimensions.
5. Cut Sheet Book: Assemble Adobe pdf set of Foodservice Equipment Technical Brochure books as part of the submittal. Every item of equipment will have a cut sheet. The words ‘See Drawing’ are not acceptable. Improperly prepared or incomplete cut sheet books will be returned without comment. Each brochure must clearly show actual model of the submitted item, if brochure lists multiple models – mark the submitted one.

B. Provide Shop Drawings and Kitchen Equipment Contractor Rough-In Drawings prepared by highly skilled people in preparation and presentation of architectural and engineering type drawings, charts, schedules and other related graphic illustrations and representations. Include plans, elevations, sections, roughing-in dimensions, fabrication details, utility service requirements, and attachments to other work. The shop details rough-in drawings and any other submittals for this section are to be submitted at the same time in a single package. Partial submittals will be held without action until the remainder of the submittals has been received. The consultant reserves the right to withhold action on submittals requiring cross-coordination with other submittal items until related submittals are received. If after 10 days there is no direction given, the Architect will be contacted for return instructions.

1. Shop Details: Submit one Adobe PDF set of shop drawings of all fabricated equipment at minimum 1/4" = 1'-0" scale. Include with all custom fabrication drawings dimensions, fabrication methods, materials, thickness, details of construction, installation, method of noted field joints, and a full Bill of Materials (BOM). Shop details must indicate reinforcements, methods of anchorage and quality of finishing. Set of PDFs will be reviewed, marked, stamped with required action noted and returned for appropriate action and copying for distribution. Contractor shall verify all field dimensions and incorporate them into shop drawings. Shop drawings must be project specific
 2. Rough-in Drawings: Submit one PDF set of complete and detailed rough-in drawings. Drawings will be professionally drawn and will be at a scale of 1/4" = 1'-0", and shall show every piece of equipment, all dimensions for rough-in points for electrical, plumbing, steam, exhaust, gas, thermos-fluid, refrigeration, wash down hoods, as well as concrete curbs, sleeves, supports, etc. and all core drilling needed. PDFs will be marked, stamped with required action noted and returned for appropriate action and copying for distribution.
 3. Record drawings, if required by the owner, will be prepared in Autodesk Revit, within 10 working days of the final punch. Drawings will be submitted electronically to the consultant for inclusion in the record drawing set not later than 15 working days from the final punch date.
 4. Equipment drawings are for design intent only and shall not be used as construction documents or shop details
- C. Allow sufficient time for review so that the installation will not be delayed because of the time required to process submittals, including time for re-submittals.
1. Within 15 working days of award of contract, submittals are required to be submitted.
 2. Allow 15 working days for initial review. Allow additional time if processing requires additional submittal material for coordination (incomplete submittals). Consultant will advise the Architect in a timely manner when additional time is necessary to process submittals, including the reason for the delay.
 3. Allow 15 working days for initial review. Allow additional time if processing requires additional submittal material for coordination (incomplete submittals). Consultant will advise the Architect in a timely manner when additional time is necessary to process submittals, including the reason for the delay.
 4. Intermediate submittals are processed on the same time basis as the initial submittal.
 5. Allow 10 days for reproduction of submittal materials.
 6. No extension of Contract Time will be allowed because of failure of the Kitchen Equipment Contractor to transmit submittals complete and on time for the Architect and Consultant to properly process submittals.

7. Review of the shop drawings/submittals will be for general conformance with the design intent and contract documents only. KEC/FSEC is responsible for field verification of all job site conditions/dimensions and coordination of work between all applicable trades. In way will the review relieve the KEC/FSEC of compliance with all requirements of the contract documents.

D. Coordination Drawings: For foodservice facilities.

1. Indicate locations of foodservice equipment and connections to utilities.
2. Key equipment using same designations (item numbers) as indicated on Design Drawings.
3. Include plans and elevations; clearance requirements for equipment access and maintenance; wall backing, details of support for equipment; and utility service characteristics.
4. Include details of seismic bracing for equipment as required by local authority.

E. Provide samples for Initial Selection: For units with factory-applied color finishes.

F. Samples for Verification: For each factory-applied color-finish required, in manufacturer's standard sizes.

G. Operation and Maintenance Data: For foodservice equipment to include in emergencies, operation, and maintenance manuals. In addition to items specified in Division 01 include the following:

1. Within ten (10) working days from Final Punch, furnish and deliver to the General Contractor a PDF set of service/parts and maintenance manuals for all equipment supplied as part of this contract. The General Contractor will route a copy to the Consultant for review. This copy will be returned with comments as necessary.
2. Product Schedule: For each foodservice equipment item, include the following:
 - a. Designation indicated on Drawings.
 - b. Manufacturer's name and model number.
 - c. Prepare a list of service agencies authorized by each manufacturer to service its equipment. Include within this listing the name of the person to contact and a telephone number for reference purposes. All contacts must be near the project location.

H. Warranty: Special warranty specified in this Section.

1.04 QUALITY ASSURANCE

- A. NSF Standards: Provide equipment that bears NSF Certification Mark or UL Classification Mark, permanently affixed to the device or equipment, certifying compliance with applicable NSF/ANSI standards.

- B. BISSC Standards: Provide bakery equipment that complies with BISSC's "Sanitation Standards for the Design and Construction of Bakery Equipment and Machinery."
- 1. Provide BISSC-certified equipment.
- C. UL Certification: Provide electric and fuel-burning equipment and components that are evaluated by UL for fire, electric shock, and casualty hazards according to applicable safety standards and that are UL certified for compliance and labeled for intended use.
- D. Steam Equipment: Provide steam-generating and direct-steam heating equipment that is fabricated and labeled to comply with ASME Boiler and Pressure Vessel Code.
- E. Check and confirm that drawings and specifications meet all Federal, State and local government regulations. The drawings and specifications govern wherever they have larger sizes or higher standards than required by such regulations. Applicable regulations will govern when they are more restrictive or require higher standards than requested by the Contract Documents. All costs for compliance with said regulations shall be borne by the Kitchen Equipment Contractor regardless of what is contained in the Contract Documents
- F. Subway grating when used on floor troughs must comply with the current edition of the International Building Code (IBC), ICC A117.1 (2017) Chapter 4, and the 2010 ADA Standards for Accessible Design (Section 302.3).
- G. Regulatory Requirements: Install equipment to comply with the following:
 - 1. ASHRAE Standard15 - 2024, " Safety Standard for Refrigeration Systems."
 - 2. NFPA 54-2024 "National Fuel Gas Code / ANSI Z223.1".
 - 3. NFPA 70-2026 "National Electrical Code / NEC".
 - 4. NFPA 96-2027 "Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations".
 - 5. U.S. Public Health Service (USPHS).
 - 6. Local County Health Department.
 - 7. O.S.H.A
 - 8. National Sanitation Foundation (N.S.F.)
 - 9. A.G.A
 - 10. A.S.M.E.
 - 11. A.S.T.M.

12. ADA (CFR Part 36).
 13. Any other jurisdictional agency not listed.
- H. Seismic Restraints: Comply with SMACNA's "Kitchen Ventilation Systems and Food Service Equipment Fabrication and Installation Guidelines," Appendix A, "Seismic Restraint Details," unless otherwise indicated.
1. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination."

1.05 PROJECT CONDITIONS

- A. Field Measurements: Indicate measurements on Coordination Drawings.
- B. Kitchen Equipment Contractor/Foodservice Equipment Contractor will verify all building conditions and coordinate with the General Contractor proper access of large equipment to the building prior to closing of bidding. Costs for any specific items or equipment required for the movement of large, heavy or bulky equipment including rigging, cartage, etc. is solely the responsibility of the Kitchen Equipment Contractor
- C. It is assumed by the Consultant that all dimensioned submitted documents reflect the verification of field conditions.

1.06 COORDINATION

- A. Coordinate food service equipment layout and installation with other work, including lighting fixtures, HVAC equipment, and fire-suppression system components.
- B. Coordinate location and requirements of utility service connections.
- C. Coordinate size, location, and requirements of the following:
 1. Overhead equipment supports.
 2. Equipment bases.
 3. Floor depressions.
 4. Insulated floors.
 5. Floor areas with positive slopes to drains.
 6. Floor sinks and drains serve food service equipment.
 7. Roof curbs, equipment supports, and penetrations.

- D. Refrigeration Compressor Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace compressors that fail in materials or workmanship within specified warranty period.
 - E. Refrigeration systems should include start-up and a 13-month parts-and-labor warranty, plus an additional four-year equipment warranty covering all refrigeration systems. This requirement applies to refrigerators, ice cream cabinets, icemakers, freezers, dispensers, and all other refrigerated equipment. Service maintenance contracts are excluded from this scope of work and may be provided at the Owner's discretion.
- 1. Failure includes, but is not limited to, inability to maintain set temperature.
 - 2. Minimum Warranty Period for all equipment supplied by the Kitchen Equipment Contractor will be parts and labor for one (1) year and (1) one (1) month after acceptance and delivery to owner. Kitchen Equipment Contractor fabricated equipment will be warranted against defects in workmanship and material for one (1) year and (1) one month after acceptance and delivery to owner. All repairs and replacements will be made as required without charge to the owner.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Supplemental to the base bid for the prime equipment as specified, the Contractor may propose substitute (alternate) equipment other than that specified. The Contractor must clearly and separately state that they are offering an alternate. The Contractor shall submit a letter of explanation addressing the advantages of the substitution for each piece of equipment to be substituted, no less than seven (7) working days prior to the close of bidding. This submission must include one copy of the original manufacturer's cut sheet, complete illustrations, specifications, capacities, utilities, and all applicable operational data for all proposed alternates, as well as the applicable price differences. It is the Contractor's responsibility to prove that the item(s) submitted as alternates are equal to the prime specified items. The Owner, with counsel from the Food Service Consultant, will be the final determining authority as to the acceptability or equality of alternates. Items of standard equipment must be the latest model and new at the time of delivery. 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. The net savings (gross foodservice equipment price deduct less base building/engineering modifications) resulting from the use of alternate equipment will be a factor in the evaluation of the acceptability of the alternates. Upon approval, a list of approved alternates not requiring further approval will be published and distributed to all bidders at least five (5) days prior to the close of bidding. It is understood that the alternate equipment will be provided "same-as" that originally specified.
- B. The base bid shall include all prime equipment specified. Including specific manufacturer, model number, size, utilities requirements, capacities, etc., as well as options and accessories.
- C. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:

1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, products specified.
2. Products: Subject to compliance with requirements, provide one of the products specified.
3. Available Manufacturers: Subject to compliance with requirements, acceptable manufacturers include those specified and others offering products that may be incorporated into the Work.
4. Manufacturers: Subject to compliance with requirements, provide products by one of the manufacturers specified.
5. Basis-of-Design Product: The design for foodservice equipment item is based on the product named. Subject to compliance with requirements, provide either the named product or a comparable product by one of the other manufacturers specified.

2.02 FABRICATED EQUIPMENT

A. Materials:

1. Stainless Steel: ASTM A 666. Stainless Steel: Stainless steel shall be of U.S. Standard gauges as indicated, but not less than 20-gauge, Type 304 with No. 4 finish.
2. Galvanized Steel: ASTM A 653/A 653M. Galvanized Steel: Galvanized Steel shall be of 14 gauge or as otherwise indicated on drawings or specifications and shall be hot dipped -galvanized. Galvanized steel may be used in all non-exposed areas, areas with no contact with food or serving items and in framework. When used in framework, galvanized steel shall be of welded construction (welding is to be done before galvanizing). Use of galvanized steel will be subject to final approval during submittal check. K.E.C. fabrication drawings will clearly identify location(s) of all galvanized components.
3. Insulation Materials: For normal temperature applications, such as custom fabricated under-counter refrigerators, use extruded polystyrene material 2 in. (50 mm) thick, bonded at all joints.
4. For low temperature applications, such as ice bins, cold pans, or custom fabricated under counter freezers, use urethane, rigid foam board or foamed-in-place, not less than 2 in. (50 mm) thick, except that vertical surfaces of cold pans and ice bins may be 1 in. (25 mm) thick. Bond insulation at joints to prevent condensation on exterior.
5. At counter tops subject to heat from cooking equipment and/or refrigeration compressors, use 1 in. (25 mm) thick Manville Martinite 36, or equal, to insulate underside of top. Also add Martinite material between freezer or refrigerator and 14 gauge (1.98 mm) stainless steel top.
6. Fiberglass insulation materials shall not be used. Insulation shall be bonded to all surfaces.

B. Miscellaneous Metals:

1. Kitchen Equipment Contractor will provide and install 22 ga stainless steel wall flashing from the top of floor cove base to under the lowest point of the exhaust hood(s). Flashing will extend the full width

of the exhaust hood. 22ga stainless steel wall flashing will be installed from the top of the backsplash to the base of wall shelves at all sinks and worktables with sinks unless otherwise stated. Corner Guards (14ga Stainless Steel, 48" high, 4" x 4", broke at 90°, with a 5° return brake) will be installed at all outside corners of the foodservice areas. 90° brake angles will be adjusted to match the actual angle of the walls. Base of the corner guards will be at the top of the floor cove base. KEC will provide and install all necessary trim panels and closures, including cosmetic coverings. Equipment closures will match the individual equipment's finishes.

C. General requirements for fabricated equipment:

1. Fabrication methods shall conform to all generally accepted conventions and requirements of the food service industry and shall meet or exceed the latest National Sanitation Foundation standards including all revisions.
2. Fabricated equipment will be manufactured to meet the intended needs of the final application. The Kitchen Equipment Contractor is responsible for reviewing the submittal drawings and monitoring the progress of the equipment during fabrication to ensure that adequate oversight is maintained. Any potential variance from the design or intended purpose must be reported to the General Contractor immediately. The Foodservice Contractor is specifically charged with providing a fully functional, maintainable, and purpose-completed device that meets the expectations of the owner.
3. Fabricated equipment approved as an alternate to specified factory manufactured will be constructed to match exactly the prime specified equipment.
4. Metal tops to be one-piece 14-gauge stainless steel welded construction or as indicated on drawings or specifications, including field joints. Tops to be secured to a full perimeter galvanized steel channel frames except at wood top tables, drain boards and dish table where channel frames shall be stainless steel and cross braced not farther than 30 in. (760 mm) on center. Fasten top with stud bolts or tack welds. Coat underside of tops with a minimum 1/16 in. (1.6 mm) thick approved hard-drying, sound-deadening, mastic material. Apply all coatings by spreading after top has been secured to frame, such that top and frame are covered and sealed. Tabletops must not deflect or distort when fully loaded.
5. Fabricate bases from not less than 18-gauge (1.27 mm) steel reinforced by forming metal ends and shelves. Partitions to be constructed of stainless steel. The ends and vertical partitions can be of single wall construction; with a 2 in. (50 mm) face partitions and sides shall be welded at intersections and be flush with the bottom edge of the bottom shelf
6. Unexposed cabinet backs and structural members will be stainless steel.
7. Legs and cross rails to be of 1 5/8 in. diameter (941 mm), 16 gauge (1.59 mm) seamless stainless-steel tubing. All cross rails to be continuously welded, ground and polished. Tack welds or other methods of connection are not acceptable. Bottoms of legs to be wedged inward and fitted with a stainless-steel bullet-type foot with not less than 2 in. adjustment. Freestanding legs are to be pegged to floor with 1/4 in (6 mm) diameter stainless steel rods.

8. Stainless steel gussets shall not be less than 3 in (76 mm) diameter and 3/4 in. (95 mm) long. Outer shell to be 16-gauge (1.59 mm) stainless steel reinforced with 12 gauge (2.78 mm) mild steel insert welded to interior of shell. Gusset to be large enough to accommodate a 1-5/8 in. (41 mm) tube and shall have an Allen screw fastener.
9. Low counter legs shall be constructed of stainless-steel exterior and shall be 5 3/4 in. (146 mm) minimum height or 7 in. (178 mm) maximum height with 3 1/2 in. (89 mm) square plate with four countersunk holes, welded to the top for fastening.
10. Adjustable feet to be constructed of stainless steel 1/2 in. (38 mm) diameter tapered at the bottom to 1 in. (25 mm) diameter, fitted with a 3/4 in. (19 mm) cold-rolled rod threaded for minimum of 1/2 in. (38 mm) for fitting into a threaded plug welded to leg. A push-in foot is not acceptable. Tables with utilities will have flanged feet and will be securely bolted to the floor with stainless steel fasteners as required by local code.
11. When legs are fastened to equipment, the following methods must be used:
 - a. Sinks: Gussets shall be welded to triangular stainless-steel plates, which in turn shall be welded to the underside of sink.
 - b. Metal Top Table or Dish table: Gussets shall be welded to 14 gauge or heavier channel reinforcing.
 - c. Wood Top: Gusset shall be welded to a stainless-steel channel of not less than 14-gauge stainless steel (1.98 mm), secured to the top with screws through slotted holes.
12. Shelves:
 - a. When shelves are part of the fixture, the following must take place:
 - 1) Open base type shelf shall be notched around the leg and continuously welded to the leg.
 - 2) Cabinet base type shelf shall be turned up 2" on the back side with a minimum of 1/4 in (6 mm) radius to ensure a tight fit to enclosure panels.
13. Wall mounted shelves:
 - a. The KEC will ensure and obtain written verification that the General Contractor provides and installs wall backing of sufficient size and strength to support the intended fixture when fully loaded or at full capacity. KEC will also provide a separate dimensioned drawing for approval that outlines the location of all walls backing required and the material intended to be used.
14. Sinks, Steam Tables, and Bain Maries:
 - a. When multiple compartments are part of the design, they shall be continuous on the exterior without applying strips or panels. Bottoms of each compartment to be creased to ensure complete drainage to waste opening.

- b. Partitions between compartments to be double thickness, continuous and welded.
- c. Where sink bowls are exposed, the exterior shall be polished to a number 4 finish.
- d. Faucets will be by T & S Brass or equal by Krowne Metal or Chicago shipped loose for installation by the Plumbing Contractor.
- e. Furnish faucets for all sinks, water stations and other fixtures as specified.
- f. Provide backflow preventers/vacuum breakers on equipment requiring them as furnished under this contract in accordance with governing codes.

15. Refrigeration Compressors and Evaporators:

- a. All Walk-In refrigeration condensing units and evaporator coil assemblies shall include pre-wiring, pre-piping, crankcase regulator, head pressure regulator/pressure relieve valve, factory-installed suction line accumulator, phased loss protection, interconnecting refrigerant lines, five year warranty, main fuse disconnect, structural steel frame and weather-proof carbon steel body panel with epoxy paint finish, and refrigerant leak detection with alarm.
- b. Evaporators shall be provided with copper drain lines by plumbing contractor.

2.03 BY PURVEYOR, BY OPERATOR, OR EXISTING EQUIPMENT

- A. Any and all food service equipment and equipment systems noted as "by owner", "by purveyor", "by operator" or "existing" in the food service construction documents are presented for reference only. These representations must be verified in writing by the kitchen equipment contractor, owner, operator, and/or general contractor prior to the release of "for construction" documentation. It will be the general contractor's responsibility to further verify and coordinate all necessary information pertaining to this equipment or systems making up, or relating to, this equipment including, but not limited to, local health department regulations, local sanitation code requirements, mechanical, structural, plumbing and electrical requirements prior to commencement of construction. Consultant or Architect take no responsibility for design, intent, function, performance, utility requirements, or code compliance of non-specified equipment.
- B. Equipment listed as 'Existing' and identified for re-use will be removed from current location, thoroughly cleaned (steam cleaning preferred), refinished (including, but not limited to polishing and painting), lubricated, adjusted, functionally tested, and all knobs, handles, and fixtures replaced. Equipment will have the appearance of extensive reconditioning and be ready to be placed into service.

2.04 MISCELLANEOUS MATERIALS

- A. Installation Accessories, General: NSF certified for end-use application indicated.

B. Elastomeric Joint Sealant: ASTM C 920; Type S (single component), Grade NS (nonsag), Class 25, Use NT (nontraffic) related to exposure, and Use M, G, A, or O as applicable to joint substrates indicated.

C. Public Health and Safety Requirements:

1. Sealant is certified for compliance with NSF standards for end-use application indicated.
2. Washed and cured sealants comply with the FDA's regulations for use in areas that encounter food.
3. Cylindrical Sealant Backing: ASTM C 1330, Type C, closed-cell polyethylene, in diameter larger than joint width.

D. Trimming and sealing equipment:

1. Any space between units to walls, ceilings, floors and adjoining non-portable units shall be completely sealed against entrance of food particles or vermin by means of trim strips, welding, soldering, or commercial joint material suitable to the nature of the equipment and acceptable to Architect.

2.05 OTHER CUSTOM FABRICATED COMPONENTS

A. Casters: Shall be heavy-duty type, ball-bearing, solid or disc wheel with non-marking greaseproof rubber, neoprene or polyurethane tires as specified.

B. Wheels shall be 5 in. (127 mm) diameter or as specified, minimum width of tread 2 1/2 in. (30 mm), with a minimum capacity per caster of 250 lbs. (113.4 kg), unless otherwise specified.

C. Solid material wheels shall be provided with stainless steel rotating wheel guards.

D. Shall be sanitary, have sealed wheel and swivel bearings and polished plate finish (per N.S.F.-7).

E. Doors: Metal doors shall be double-cased stainless steel. Outer pan shall be 18 gauge (1.27 mm) stainless steel with corners welded, ground smooth, and polished. Inner pan shall be 20 gauge (.95 mm) stainless steel fitted tightly into outer pan with a sound-deadening material such as Celotex or extruded polystyrene used as a core. The two pans shall be tack-welded together and joints solder-filled. Doors shall be finished approximately 3/4 in. (19 mm) thick and be fitted with flush recessed type stainless steel door pulls.

F. Sliding doors shall be self-closing, mounted on large, quiet ball-bearing rollers in 14 gauge (1.98 mm) stainless steel overhead tracks and be removable without the use of tools. Bottom of cabinet to have stainless steel guide-pins and not channel tracks for doors.

G. Wood doors to be custom fabricated as detailed. All sides and edges shall be laminated.

H. Hinged doors to be mounted on heavy-duty N.S.F. approved hinges, Model #2970-1010-1250 by Standard Keil or as noted on plans or specifications.

- I. Hardware: Shall be solid, heavy-duty type.
- J. Identify manufacturer's name and number so that broken or worn parts may be replaced.
- K. Submit samples for approval, when requested.
- L. Drawer Assemblies: Assemblies shall consist of removable drawer body mounted in a ball bearing slide assembly with padlock hasp.
- M. Slide assembly shall consist of one pair of stainless-steel rollers bearing, self-closing extension slides with side and back enclosure panels, front spacer angle, two drawer carrier angles secured to slides and stainless-steel front.
- N. Drawers intended shall hold food products to be removable with 12" x 20" (305 mm X 508 mm) stainless steel assembly.
- O. Drawer fronts shall be double cased, 3/4 in. (19 mm) thick, with an 18 gauge (1.27 mm) stainless steel welded and polished front pan. The stainless-steel back pan shall be tightly fitted and tack welded. The drawer shall be sound deadened with rigid insulation.
- P. Provide all drawers with replaceable soft neoprene bumpers or, for refrigerated drawers, a full perimeter soft gasket.

2.06 CUSTOM FABRICATED WORKMANSHIP

- A. Items of especially custom fabricated equipment must be custom fabricated by an acceptable manufacturer, who is N.S.F. approved and custom fabricated in an approved manner to the complete and final satisfaction of the Contractor.
- B. Welding and Soldering: Materials 18 gauge (1.27 mm) or heavier, shall be welded.
- C. Seams and joints shall be shop-welded or soldered as the nature of the material will require.
- D. Welds shall be ground smooth and polished to match original finish.
- E. Where galvanizing has been burned off, the weld shall be cleaned and touched up with high-grade aluminum paint.
- F. Fasteners and Joints, the following are not permitted:
 - 1. Exposed screw or bolt heads.
 - 2. Rivets.
- G. Butt-joints made by riveting straps under seams and then filled with solder.
- H. All fasteners exposed to moisture will be stainless steel.

- I. Rolled Edges: Rolled edges to be as detailed, with corners bullnosed, ground and polished.
- J. Coved Corners: All stainless-steel food service equipment shall have 3/4 in. (15 mm) or larger radius coves in all horizontal and vertical corners and intersections per N.S.F-7. Standards.
- K. Closures: Where ends of fixtures, backsplashes, shelves, etc. are open, fill by forming the metal, or weld sections, if necessary, to close entire opening flush to walls or adjoining fixtures.
- L. Fabricated equipment having a specified manufacturer, if fabricated by another manufacturer; It shall be specifically understood that all standard accessories, construction details, and features, whether stated or not, will be met, and/or provided by the current manufacturer.
- M. All shelves, counter, or other penetrations will have properly sized grommets installed and secured to prevent accidental removal.

2.07 OPERATIONAL REQUIREMENTS

- A. Insure quiet operation of food service and related equipment. Provide sound deadening on all tables, counters, undershelves, sinks and drain boards.
- B. Ensure bumper gaskets, stops, and any other protection is installed on all custom fabricated equipment as needed.

2.08 CONNECTION TERMINALS

- A. All custom fabricated equipment shall be provided with standard connection terminals to allow other contractors to make final connections on job site.

2.09 EXHAUST HOODS, WALK-IN COOLERS AND DISHMACHINES

- A. Verify size and location of all connections required before fabrication.
- B. Check job site prior to installation of walk-in coolers to verify proper dimensions and for required trim.
- C. Provide all stainless-steel duct connections and collars.
- D. 22 Gauge Stainless Steel Wall Flashing is required from the lowest point of the Exhaust Hood to the top of the cove base, and full width of the hood. All seams and edges will be fully finished. Overlap seams or raw edges are not acceptable.
- E. Fire dampers, if required, are to be provided by the KEC and installed by the Mechanical Contractor, and subject to the requirements of prevailing local codes.

2.10 INSERT PANS

- A. All cut-outs, openings, drawers, and equipment specified or detailed to hold stainless steel insert pans shall be provided with a full complement of pans as follows:
 - 1. One (1) stainless steel, 20-gauge (.95 mm) minimum, solid stainless steel insert pan for each space, sized per plans, details, and specifications.
- B. Where pan sizes are not indicated in plans, details, or specifications, provide one full-size stainless-steel pan to securely fit each opening.
- C. Provide a maximum size depth pan to suit each application and space allocated for same.
- D. Provide 18 gauge (1.27 mm) removable stainless steel adapter bars where applicable.

2.11 TRAY SLIDES

- A. Verify the following before fabrication of counters with tray slides:
 - 1. Configuration of all corners, turns, and shape of tray slides for proper support and safe guidance of trays.
 - 2. Size and shape of tray to be used in operation – request sample for owner/operator if needed.

2.12 ENCLOSURES

- A. Provide and install enclosure panels secured or removable as specified for any item which houses equipment with movable parts, i.e. compressors, pumps, etc. Also, cover and provide protection for any exposed steam line or condensate line, which may be within reach of operating personnel.
- B. Provide stainless-steel matching enclosures for hoods, walk-in boxes and other items to conceal gaps between the equipment and the walls and ceilings.

2.13 DISPENSER (SELF-LEVELING)

- A. Verify make of ware, their dimensions, and weight and submit to the dispenser manufacturer at earliest possible date so that springs may be properly calibrated.

2.14 WATER FILTER-PURIFIER

- A. Furnish in-line water filter-purifiers to remove contaminants, minerals, taste, or odors from beverage system, coffee urns, and icemakers, and steamers, manufactured by Everpure or equal. Provide proper size filter - purifier for equipment being supplied. Locate to ensure easy access for cartridge replacement.
- B. Obtain water testing kit from filtration company, test water and confirm that specified filter will work with water available at the project site.

2.15 ELECTRICAL WORK - GENERAL REQUIREMENTS

- A. Before ordering equipment, confirm with the Contractor, all pertinent electrical requirements such as actual voltages available, number of phases and number of wires in the system.
- B. Electrical work for custom fabricated equipment shall be completely wired by this Contractor to a junction or pull box, easily accessible, mounted on the equipment. Wiring shall be labeled for outlet or item served.
- C. Components and assemblies shall bear the U.L. label or be approved by the prevailing authority.
- D. Provide custom fabricated and standard refrigerated units with vapor tight receptacles, shatterproof lamps and automatic switches. All wiring to be concealed.
- E. Electrical Contractor shall provide all code conforming electrical receptacles serving applicable Section 114000 Foodservice Equipment.
- F. Electrical Contractor shall provide and install shunt trip breakers as required.
- G. Electrical Contractor shall provide and install disconnects for high voltage equipment.
- H. Electrical Contractor shall provide and install spiral wrap heat tape at the rate of 6W per foot on condensate drain lines in all walk-in freezers.
- I. Electrical Contractor shall provide and install spiral wrap heat tape at the rate of 6W per foot on condensate drain lines in all walk-in freezers.

2.16 INTERNAL WIRING OF FIXTURES AND EQUIPMENT

- A. Contractors shall be responsible for internal wiring of electrical devices and shall build them into or form them as an integral part of the custom fabricated equipment items. Wiring to be placed in metal conduit into a pull box tagged for intended use. Check with the Contractor for color-coding of wiring.
- B. Each standard item shipped in sections shall be properly connected internally and verified.
- C. Provide dishwashers and conveyors internally wired to junction box or distribution panel as specified, including push button switches, motors, immersion heaters, solenoids, etc.
- D. Where light fixtures are specified or detailed as part of counters, cases or fixtures, light fixtures and lamps to be provided unless otherwise specified. If fluorescent light fixtures are specified, all ballasts shall be included.
- E. Wiring for built-in strip heaters or immersion-type elements shall be provided as follows:
- F. In heat zone, have U.L. has approved insulation and not less than 300 volt rated with nickel wire.
- G. Connection wiring extended in raceway or conduit to junction or pull box shall not be less than 600 volts rated A.V.A. insulation covered wire, U.L. approved, or equal.

- H. Wiring for custom fabricated refrigerator and freezer cabinets shall be U.L. approved, insulated cable from exterior junction box to internal components within insulation, unless code requires metallic conduit:
- I. Conduit shall be Electrical Metallic Tubing, rigid or flexible (Greenfield). For freezer applications, Seal Tite Flex or approved equal shall be used.
- J. Internal wiring shall be U.L. approved rubber covered 600 volt rated conductor except door heaters, which shall be nichrome wire with silicone braided jacket having resistance of 10.4 watts per lineal foot.
- K. Convenience outlets, lighting receptacles (rubber or porcelain), and door switches shall be mounted in approved boxes. Convenience outlets for evaporators shall be twist-lock type. Solid connections as for freezer evaporators shall be made vapor tight.
- L. Exposed flexible steel conduit on kitchen equipment shall be neoprene jacketed "Seal-Tite" conduit equal to Anaconda type "UV" U.L. approved, complete with approved liquid-tight connectors on each end, designed to provide electrical grounding continuity.
- M. Exposed electrical conduit used in kitchen wet area applications, except for flexible connections, shall be rigid galvanized steel. Thin wall conduit (EMT) will not be permitted for wet areas. Exposed outlet boxes shall be liquid-tight with thread hubs.

2.17 CONVENIENCE AND POWER OUTLETS

- A. Make cut-outs and install appropriate boxes or outlets in custom fabricated fixtures complete with wiring conduit, outlet and cover plate.
- B. All outlets and plugs shall conform to NEMA standards. Convenience (and all 120V outlets) will be NEMA 5-20R, horizontally mounted.
- C. All electrical outlets and devices shall be first quality "Specification Grade."

2.18 PLUGS AND CORDS

- A. Where cords and plugs are used, they must comply with National Electrical Manufacturer's Association (NEMA.) requirements.

2.19 HEATING EQUIPMENT

- A. Electric and heating equipment to be ready to be readily cleanable or easily removable for cleaning.
- B. Steam-heated custom fabricated equipment shall be of self-contained assembly complete with control valves located in an accessible position.

2.20 STARTERS, SWITCHES AND CONTROLS

- A. Furnish all starters, motor controls, remote controls and transformers as required.
- B. Locate all switches out of heat zone.
- C. All starters, switches and controls shall have white on black phenolic plastic identification plates with stainless steel screws conspicuously located on adjacent surfaces.

2.21 REFRIGERATION

- A. Compressors and related components must be fully accessible for service and maintenance.
- B. Obsolete or soon to be obsolete refrigerants must not be used.

2.22 COLD PANS

- A. Ice pans, refrigerated pans, and cabinets shall be provided with breaker strips where adjoining top or cabinet face materials to prevent the transfer of cold.
- B. Plumbing contractor to provide copper drain line to floor sink.

2.23 VENTILATION OF REFRIGERATED EQUIPMENT

- A. Adequate air supply and exhaust shall be provided for all self-contained or remote refrigeration condensing units, both custom fabricated and standard, as required for proper operation.
- B. If additional ventilation is required to ensure correct operating temperatures, so state in a letter to the Contractor for evaluation and decision before purchase/fabrication.

2.24 COMPONENTS

- A. Coils: Coils for standard and custom fabricated refrigerators to have vinyl plastic coatings, stainless steel housings and should be installed in such a manner as to be replaceable.
- B. Expansion Valves: Standard reach-in refrigerators and freezers, for remote refrigeration systems, shall be complete with thermostatic expansion valves at the evaporator.
- C. Thermometers: Refrigerated compartments, custom fabricated and standard shall be fitted with flush digital type thermometers with chrome-plated bezels.
- D. Thermometers to be calibrated after installation.
- E. Thermometers shall have an accuracy of + 2oF. (1oC).
- F. Walk-in boxes will have digital alarms as noted in itemized specifications.
- G. Hardware: Refrigerator hardware for standard and custom fabricated refrigerator compartments shall be solid, heavy-duty components.

- H. Hinges must be self-closing.
- I. Latches shall be magnetic edge mount-type unless specified or detailed otherwise.
- J. Locks: Doors and drawers for reach-in refrigerated compartments, both custom fabricated and standard, to be fitted with cylinder locking type latches, and provided with master keys.

2.25 MANUFACTURERS' ITEMIZED EQUIPMENT

- A. The following equipment is to be provided with all necessary components and accessories necessary for operation unless otherwise stated. This includes but is not limited to; Hoses, disconnects, cords, plugs, adapters, regulators, back flow prevention devices, filters, isolation mounts, seals, closures, fillers, or restraints.
- B. All fasteners will be stainless steel, and fastener heads will be burr-free.
- C. Each of the following items is to be complete with all factory accessories and options included in the specified model as well as options, modifications, or accessories as listed. Each item will be of the size and shape as shown on the plan. Each will meet all applicable federal, state, and local code requirement(s).
- D. Equipment will be set in place per plan and be fully operational unless otherwise directed.
- E. Equipment listed as existing will be thoroughly cleaned and inspected for functional serviceability. Defects will be noted and reported to owner for disposition.
- F. Equipment that attaches to walls, and has legs, will be attached to the wall under the backsplash with 'Z' clips every 32" or closer, and the legs pinned to the floor with stainless steel pins. All wall mounted equipment must have wall backing at the mounting points. Tables with utilities will have flanged feet bolted to the floor. The General Contractor will provide suitable wall backing located by the K.E.C. on the Building Conditions Plan Sheet(s).
- G. K.E.C. will provide and install wall bumpers wherever impact damage from mobile equipment is possible in addition to locations pre-designated on drawings.
- H. Gas connections will be 3/4" rear entry unless otherwise noted with gas pressure regulator. Connection will be with a properly installed, correct length, (by Dormont or equal) and an approved safety restraint cable.
- I. Shelving will be assembled on the first shelf ten inches (10") off floor, or as required by local code, with the balance of shelves equally spaced to top of post.
- J. All work must meet all applicable federal, state, and local laws, rules, regulations, and codes.
- K. Plate lowerators, tray dispensers, and other dispensing-type devices. The KEC must confirm the container or tray sizes required by the Owner or Operator.

- L. Gas supply cut-off valves (considered part of the fire suppression system) will be supplied by the KEC and installed by the Mechanical Contractor. In every case the valves will be electrically tripped and manually reset. Electric or automatic reset valves are not permitted. Gas supply cut-off valves (considered part of the fire suppression system) will be supplied by the KEC and installed by the Mechanical Contractor. In every case the valves will be electrically tripped and manually reset. Electric or automatic reset valves are not permitted.

ITEMIZED EQUIPMENT

DRAWING: FS1.1 – LOADING DOCK

ITEM NO. 1 - SANITIZING SYSTEM W/ SPRAY WAND – CONTROL UNIT FISHER, MODEL: 1801

Components: Item to be complete with all standard factory features and accessories, including the following options and modifications:

- Wall-mount design.
- Stainless steel cabinet enclosure.
- Dual check backflow preventer.
- Water hammer silencer.
- 90-degree panel lock with padlock hasp and finger latch.
- 1/2-in. NPT female inlets and outlets.
- Overall length: 14 in.
- Controls item 2.

ITEM NO. 2 - HOSE REEL FISHER, MODEL: 29801

Components: Item to be complete with all standard factory features and accessories, including the following options and modifications:

- Wall-mount design.
- Designed to withstand high-volume use and promotes sanitation.
- 30' x 3/8" Reel Hose.
- 3-Ply "Aircraft" Hydraulic Hose - Lasts three time longer.
- 3-Ply Aircraft Hydraulic Hose - Lasts three time longer.
- Extended Length Threaded Insert - Securely Seals Inner Hose.
- 3/8" Female NPT Inlet.
- Wall Mounted Reel Rinse.

ITEM NO. 3 - FLOOR TROUGH EAGLE GROUP, MODEL: FT-1260-SG

Components: Item to be complete with all standard factory features and accessories, including the following options and modifications:

- Confirm site condition prior installation.
- 14-gauge stainless style grate with 1" clearance between bars.

ITEM NO. 4 - FORK LIFT - BY GENERAL CONTRACTOR

ITEM NO. 5 - PALLET TRUCK - BY GENERAL CONTRACTOR

ITEM NO. 6 - STAGING WALK IN COOLER

BALLY REFRIGERATED BOXERS, MODEL: FABRICATED

Components: Item to be complete with all standard factory features and accessories, including the following options and modifications:

- Size and configuration as shown on plan.
- 16'-0" overall height.
- 33° - 38° temperature range.
- No floor insulation for walk-in cooler.
- Wall, ceiling, and floor panel insulation shall be a full 4" Class 1 foamed-in-place urethane with a K factor of at least .125. All panels to be built with 4" high density urethane structural rails at the perimeter with cam locks along each side and two cam locks at the ceilings and floor connections. Ceilings shall support a minimum 10# live load measured at L/180.
- Exposed exterior – shall be .040 stucco aluminum with baked on white finish, diamond plate to 48" above floor level.
- Exposed exterior, closure panels, and trim strips to adjacent walls shall be .040 stucco aluminum with baked on white finish. Exposed interior should be .040 stucco aluminum with baked on white finish. Unexposed exterior shall be 26-gauge stucco galvanized steel.
- Include press switch with pilot light and weather-proof cover plate. All conduits to be run concealed inside panels and stubbed through the ceiling for electrical connections.
- The exposed exterior shall be covered in 48" high above finished floor .10 aluminum diamond tread wainscoting, cut and pre-drilled for field installation by Food Service Equipment Contractor.
- Vertical closures and removable ceiling closures to be provided to seal off open air space around and above the walk-in. Closures to be constructed of same material as exposed exterior of walk-ins.
- LED interior lighting. Interior and exterior light switches. Light levels meet or exceed code (50 fc). Provide extra lighting beyond manufacturer's standards.
- Temperature alarm mounted flush with panel interior face. Basic digital display with audible temperature alarm.
- New detailed Shop Drawings for approval prior to fabrication.
- Provide electronically operated 6'x10' high cooler sliding door with 15 second automatic timed close in location and quantity as shown on drawings. Doors to include 14"x24" viewport.
- Provide bi-parting impact doors.
- Provide actuator near the door inside and out of walk-in cooler.
- Provide interior and exterior goal post style door protection painted yellow at each sliding door location.
- Provide heavy-duty steel cooler door sills and contraction joints to prevent concrete chips out.

- Walk-in installer:
 - Steve Stock and Associates:
 - 303-295-2856, Email: steve@stevestock.com

**ITEM NO. 7 - STAGING WALK IN COOLER REMOTE REFRIGERATION UNIT
BALLY REFRIGERATED BOXERS, MODEL: BEZA030H9-HT4E**

Components: Item to be complete with all standard factory features and accessories, including the following options and modifications:

- Self-contained refrigeration.
- Item located on the roof of the building on at least 4" curb (curb by general contractor).
- Condensing units shall be provided with an enclosure that prevents the entry of birds or hail into the compressor/coil area (this includes the face of the condenser coil).
- Refrigerant piping within the cooled space shall be minimized in favor of placing long or complicated runs in ceiling void above the walk-in box.
- Escutcheons shall be provided for all refrigerant and condensate piping penetrations in walk-in walls or ceilings.
- Item sized to serve item 6 – staging cooler.
- 3/8" Tubing coil construction.
- Adjustable pressure fan cycling control on 2 fan models.
- Anti-short cycle time delay.
- Copper tubing secured with cushion clamps.
- Discharge line temperature sensor.
- Fan guard.
- Fan motors with internal overloads.
- Pre-formed piping.
- Receiver with fusible plug and liquid shut off valve.
- Suction service valve.
- Adjustable flooded head pressure control.
- Units are shipped with Helium holding charge.
- Weatherproof electrical control box with compressor contactor and fused control circuit.
- Welded hermetic scroll compressor.
- Adjustable low-pressure control with flex hose/fixed high-pressure control.
- High efficiency enhanced copper tube and aluminum coil design.
- A2L Compatible refrigerant.
- Foam refrigerant line insulation shall not be directly exposed to weather.
- Refrigerant leak detection compliant with A2L refrigerant.
- All electrical interconnections to be completed by Refrigeration installers.
- Refrigeration installer:
 - Steve Stock and Associates:
 - 303-295-2856, Email: steve@stevestock.com

ITEM NO. 8 - WALK-IN EVAPORATOR COIL

BALLY REFRIGERATED BOXERS, MODEL: MBP124MA-S4E

Components: Item to be complete with all standard factory features and accessories, including the following options and modifications:

- Refrigeration from item 7.
- Designed and installed to serve item 6.
- 3/8" tubing coil construction.
- Factory installed solenoid valve wire harness.
- Heavy gauge textured aluminum cabinet construction to resist scratches/corrosion.
- NSF approved "flush to ceiling mount".
- Unit to be shipped upright for handling and installation.
- Totally enclosed, internally protected, ball bearing motors.
- Schrader connection on suction header.
- Hinged access panels to spacious electrical and header compartments.
- Ultra efficient Electronically Commutated Motor (ECM).
- ECM with SmartSpeed technology.
- High efficiency enhanced copper tube and aluminum fin coil design.
- Compatible with A2L.
- Condensate lines shall be routed to minimize exposure to temperatures below 32 degrees. Condensate lines located within a space expected to fall below 32 degrees Fahrenheit are to be heat taped and then insulated. These lines shall also be pitched to the greatest extent possible but under no circumstance less than 1/4" per foot. Condensate lines located within space expected to fall below 32 degrees Fahrenheit may not have a trap located within the refrigerated space.

ITEM NO. 9 - SPARE NUMBER

ITEM NO. 10 - SPARE NUMBER

ITEM NO. 11 - TRANSPORT CART

F.W.E., MODEL: ETC-UA-13INS

Components: Item to be complete with all standard factory features and accessories, including the following options and modifications:

- Full height.
- Insulated.
- (13) 18-in. x 26-in. bun tray or (26) 12-in. x 20-in. tray capacity.
- Holds trays on universal tray slides that can be removed.
- Adjustable slides.
- Slides are mounted on 4 1/2-in. centers.
- 1 door with a push bar handle.
- 20-ga. stainless steel exterior with 22-ga. stainless steel interior.
- 2 rigid and 2 swivel and braking casters provide mobility.
- Overall dimensions: 29 3/4 in. W x 34 in. D x 69 1/2 in. H.

ITEM NO. 12 - SPARE NUMBER

ITEM NO. 13 - SPARE NUMBER

ITEM NO. 14 - WASHER - BY GENERAL CONTRACTOR

ITEM NO. 15 - SPARE NUMBER

ITEM NO. 16 - DRYER - BY GENERAL CONTRACTOR

ITEM NO. 17 - SPARE NUMBER

ITEM NO. 18 - SPARE NUMBER

ITEM NO. 19 - SPARE NUMBER

ITEM NO. 20-50 - SPARE NUMBER

DRAWING: FS2.1 – STORAGE

ITEM NO. 51 - BULK WALK IN COOLER

BALLY REFRIGERATED BOXERS, MODEL: FABRICATED

Components: Item to be complete with all standard factory features and accessories, including the following options and modifications:

- Size and configuration as shown on plan.
- 16'-0" overall height.
- 33° - 38° temperature range.
- No floor insulation for walk-in cooler.
- Wall, ceiling, and floor panel insulation shall be a full 4" Class 1 foamed-in-place urethane with a K factor of at least .125. All panels to be built with 4" high density urethane structural rails at the perimeter with cam locks along each side and two cam locks at the ceilings and floor connections. Ceilings shall support a minimum 10# live load measured at L/180.
- Exposed exterior – shall be .040 stucco aluminum with baked on white finish, diamond plate to 48" above floor level.
- Exposed exterior, closure panels, and trim strips to adjacent walls shall be .040 stucco aluminum with baked on white finish Exposed interior should be .040 stucco aluminum with baked on white finish. Unexposed exterior shall be 26-gauge stucco galvanized steel.
- Include press switch with pilot light and weather-proof cover plate. All conduits to be run concealed inside panels and stubbed through the ceiling for electrical connections.
- The exposed exterior shall be covered in 48" high above finished floor .10 aluminum diamond tread wainscoting, cut and pre-drilled for field installation by Food Service Equipment Contractor.
- Vertical closures and removable ceiling closures to be provided to seal off open air space around and above the walk-in. Closures to be constructed of same material

- as exposed exterior of walk-ins.
- LED interior lighting. Interior and exterior light switches. Light levels meet or exceed code (50 fc). Provide extra lighting beyond manufacturer's standards.
- Temperature alarm mounted flush with panel interior face. Basic digital display with audible temperature alarm.
- New detailed Shop Drawings for approval prior to fabrication.
- Provide electronically operated 6'x10' high cooler sliding doors with 15 second automatic timed close in location and quantity as shown on drawings. Doors to include 14"x24" viewport.
- Provide bi-parting impact doors.
- Provide actuator near the door inside and out of walk-in cooler.
- Provide interior and exterior goal post style door protection painted yellow at each sliding door location.
- Provide heavy-duty steel cooler door sills and contraction joints to prevent concrete chips out.
- Walk-in installer:
 - Steve Stock and Associates:
 - 303-295-2856, Email: steve@stevestock.com

**ITEM NO. 52 - BULK WALK IN COOLER EVAPORATOR COIL
BALLY REFRIGERATED BOXERS, MODEL: BMP248MA-S4E**

Components: Item to be complete with all standard factory features and accessories, including the following options and modifications:

- Refrigeration from item 53.
- Designed and installed to serve item 51.
- 3/8" tubing coil construction.
- Factory installed solenoid valve wire harness.
- Heavy gauge textured aluminum cabinet construction to resist scratches/corrosion.
- NSF approved "flush to ceiling mount".
- Unit to be shipped upright for handling and installation.
- Totally enclosed, internally protected, ball bearing motors.
- Schrader connection on suction header.
- Hinged access panels to spacious electrical and header compartments.
- Ultra efficient Electronically Commutated Motor (ECM).
- ECM with SmartSpeed technology.
- High efficiency enhanced copper tube and aluminum fin coil design.
- Compatible with A2L.
- Condensate lines shall be routed to minimize exposure to temperatures below 32 degrees. Condensate lines located within a space expected to fall below 32 degrees Fahrenheit are to be heat taped and then insulated. These lines shall also be pitched to the greatest extent possible but under no circumstance less than 1/4" per foot. Condensate lines located within space expected to fall below 32 degrees Fahrenheit may not have a trap located within the refrigerated space.

ITEM NO. 53 - BULK WALK IN COOLER REFRIGERATION SYSTEM

BALLY REFRIGERATED BOXERS, MODEL: BEZA06H9-HT4E

Components: Item to be complete with all standard factory features and accessories, including the following options and modifications:

- Self-contained refrigeration.
- Items (quantity of 2) located on the roof of the building on at least 4" curb (curb by general contractor).
- Condensing units shall be provided with an enclosure that prevents the entry of birds or hail into the compressor/coil area (this includes the face of the condenser coil).
- Refrigerant piping within the cooled space shall be minimized in favor of placing long or complicated runs in ceiling void above the walk-in box.
- Escutcheons shall be provided for all refrigerant and condensate piping penetrations in walk-in walls or ceilings.
- Item sized to serve item 51 – bulk walk-in cooler.
- 3/8" Tubing coil construction.
- Adjustable pressure fan cycling control on 2 fan models.
- Anti-short cycle time delay.
- Copper tubing secured with cushion clamps.
- Discharge line temperature sensor.
- Fan guard.
- Fan motors with internal overloads.
- Pre-formed piping.
- Receiver with fusible plug and liquid shut off valve.
- Suction service valve.
- Adjustable flooded head pressure control.
- Units are shipped with Helium holding charge.
- Weatherproof electrical control box with compressor contactor and fused control circuit.
- Welded hermetic scroll compressor.
- Adjustable low-pressure control with flex hose/fixed high-pressure control.
- High efficiency enhanced copper tube and aluminum coil design.
- A2L Compatible refrigerant.
- Foam refrigerant line insulation shall not be directly exposed to weather.
- Refrigerant leak detection compliant with A2L refrigerant.
- All electrical interconnections to be completed by Refrigeration installers.
- Refrigeration installer:
 - Steve Stock and Associates:
 - 303-295-2856, Email: steve@stevestock.com

ITEM NO. 54 - PALLET RACK (PUSH BACK AND STATIC) SYSTEM

BALLY REFRIGERATED BOXERS, MODEL: CUSTOM

Components: Item to be complete with all standard factory features and accessories, including the following options and modifications:

- Two (2) tier design.

- Double deep racks on the plan to be push-back.
- Single deep racks to be static.
- Size and configuration as shown on plan. Verify with site conditions.
- Provide and install complete 2 tier/level push back rack pallet rack system per drawings.
- Provide bumpers at corners.
- Coordinate forklift configuration with system.
- Verify if fire protection is required within racking system. Coordinate and make accommodation if required.

ITEM NO. 55 - SPARE NUMBER

ITEM NO. 56 - BULK WALK IN FREEZER

BALLY REFRIGERATED BOXERS, MODEL: FABRICATED

Components: Item to be complete with all standard factory features and accessories, including the following options and modifications:

- Size and configuration as shown on plan.
- 16'-0" overall height.
- 0° - (-10°) temperature range.
- Floor insulation for freezer per detail on FS2.2. with glycol heated floor.
- Wall, ceiling, and floor panel insulation shall be a full 4" Class 1 foamed-in-place urethane with a K factor of at least .125. All panels to be built with 4" high density urethane structural rails at the perimeter with cam locks along each side and two cam locks at the ceilings and floor connections. Ceilings shall support a minimum 10# live load measured at L/180.
- Exposed exterior – shall be .040 stucco aluminum with baked on white finish, diamond plate to 48" above floor level.
- Built-in blast chillers/freezers.
- Exposed exterior, closure panels, and trim strips to adjacent walls shall be .040 stucco aluminum with baked on white finish Exposed interior should be .040 stucco aluminum with baked on white finish. Unexposed exterior shall be 26-gauge stucco galvanized steel.
- Include press switch with pilot light and weather-proof cover plate. All conduits to be run concealed inside panels and stubbed through the ceiling for electrical connections.
- The exposed exterior shall be covered in 48" high above finished floor .10 aluminum diamond tread wainscoting, cut and pre-drilled for field installation by Food Service Equipment Contractor.
- Vertical closures and removable ceiling closures to be provided to seal off open air space around and above the walk-in. Closures to be constructed of same material as exposed exterior of walk-ins.
- LED interior lighting. Interior and exterior light switches. Light levels meet or exceed code (50 fc). Provide extra lighting beyond manufacturer's standards.
- Temperature alarm mounted flush with panel interior face. Basic digital display with audible temperature alarm.

- New detailed Shop Drawings for approval prior to fabrication.
- Provide electronically operated 6'x10' high cooler sliding doors with 15 second automatic timed close in location and quantity as shown on drawings. Doors to include 14"x24" viewport.
- Provide bi-parting impact doors.
- Provide actuator near the door inside and out of walk-in cooler.
- Provide interior and exterior goal post style door protection painted yellow at each sliding door location.
- Provide heavy-duty steel cooler door sills and contraction joints to prevent concrete chips out.
- Walk-in installer:
 - Steve Stock and Associates:
 - 303-295-2856, Email: steve@stevestock.com

**ITEM NO. 57 - BULK WALK IN FREEZER EVAPORATOR COIL
BALLY REFRIGERATED BOXERS, MODEL: BMP233LE-S4E**

Components: Item to be complete with all standard factory features and accessories, including the following options and modifications:

- Refrigeration from item 58.
- Designed and installed to serve item 56.
- 3/8" tubing coil construction.
- Factory installed solenoid valve wire harness.
- Heavy gauge textured aluminum cabinet construction to resist scratches/corrosion.
- NSF approved "flush to ceiling mount".
- Unit to be shipped upright for handling and installation.
- Totally enclosed, internally protected, ball bearing motors.
- Schrader connection on suction header.
- Hinged access panels to spacious electrical and header compartments.
- Ultra efficient Electronically Commutated Motor (ECM).
- ECM with SmartSpeed technology.
- High efficiency enhanced copper tube and aluminum fin coil design.
- Compatible with A2L.
- Condensate lines shall be routed to minimize exposure to temperatures below 32 degrees. Condensate lines located within a space expected to fall below 32 degrees Fahrenheit are to be heat taped and then insulated. These lines shall also be pitched to the greatest extent possible but under no circumstance less than 1/4" per foot. Condensate lines located within space expected to fall below 32 degrees Fahrenheit may not have a trap located within the refrigerated space.

**ITEM NO. 58 - BULK WALK IN FREEZER REFRIGERATION SYSTEM
BALLY REFRIGERATED BOXERS, MODEL: BEZA085L9-HT4E**

Components: Item to be complete with all standard factory features and accessories, including the following options and modifications:

- Self-contained refrigeration.
- Items (quantity of 3) located on the roof of the building on at least 4" curb (curb by

general contractor).

- Condensing units shall be provided with an enclosure that prevents the entry of birds or hail into the compressor/coil area (this includes the face of the condenser coil).
- Refrigerant piping within the cooled space shall be minimized in favor of placing long or complicated runs in ceiling void above the walk-in box.
- Escutcheons shall be provided for all refrigerant and condensate piping penetrations in walk-in walls or ceilings.
- Item sized to serve item 56 – bulk walk-in freezer.
- 3/8” Tubing coil construction.
- Adjustable pressure fan cycling control on 2 fan models.
- Anti-short cycle time delay.
- Copper tubing secured with cushion clamps.
- Discharge line temperature sensor.
- Fan guard.
- Fan motors with internal overloads.
- Pre-formed piping.
- Receiver with fusible plug and liquid shut off valve.
- Suction service valve.
- Adjustable flooded head pressure control.
- Units are shipped with Helium holding charge.
- Weatherproof electrical control box with compressor contactor and fused control circuit.
- Welded hermetic scroll compressor.
- Adjustable low-pressure control with flex hose/fixed high-pressure control.
- High efficiency enhanced copper tube and aluminum coil design.
- A2L Compatible refrigerant.
- Foam refrigerant line insulation shall not be directly exposed to weather.
- Refrigerant leak detection compliant with A2L refrigerant.
- All electrical interconnections to be completed by Refrigeration installers.
- Refrigeration installer:
 - Steve Stock and Associates:
 - 303-295-2856, Email: steve@stevestock.com

ITEM NO. 59 - SPARE NUMBER

ITEM NO. 60 - SPARE NUMBER

ITEM NO. 61 - PALLET RACK

BALLY REFRIGERATED BOXERS, MODEL: CUSTOM

Components: Item to be complete with all standard factory features and accessories, including the following options and modifications:

- Two (2) tier design.
- Double deep racks on the plan to be push-back.
- Single deep racks to be static.

- Size and configuration as shown on plan. Verify with site conditions.
- Provide and install complete 2 tier/level push back rack pallet rack system per drawings.
- Provide bumpers at corners.
- Coordinate forklift configuration with system.
- Verify if fire protection is required within racking system. Coordinate and make accommodation if required.

ITEM NO. 62 - BLAST CHILLER/FREEZER

BALLY REFRIGERATED BOXERS, MODEL: CUSTOM

Components: Item to be complete with all standard factory features and accessories, including the following options and modifications:

- Floorless design.
- Holds 500 lbs. of product.
- Stainless steel exterior.
- 4-in.-thick poured-foam insulation.
- Universal rack compatibility.
- 2 rack assemblies.
- 36-in. x 78-in. hinged door.
- 3 probes.
- Audio-visual alarm.
- Air-cooled, side-mounted system.
- Electronic controller with HACCP software.
-

ITEM NO. 63 - UTILITY RACK

NEW AGE, MODEL: 1335

Components: Item to be complete with all standard factory features and accessories, including the following options and modifications:

- Bun pan rack, mobile, full height, end loading, with open sides.
- Rack accommodates twenty (18) 18" x 26" pans, slides on 3" centers.
- All welded aluminum construction.
- Includes non-marking resilient 5" platform casters.

ITEM NO. 64 - BLAST CHILLER REFRIGERATION SYSTEM

BALLY REFRIGERATED BOXERS, MODEL: CUSTOM

Components: Item to be complete with all standard factory features and accessories, including the following options and modifications:

- Self-contained refrigeration.
- Items (quantity of 2) located on the roof of the building on at least 4" curb (curb by general contractor).
- Condensing units shall be provided with an enclosure that prevents the entry of birds or hail into the compressor/coil area (this includes the face of the condenser coil).
- Refrigerant piping within the cooled space shall be minimized in favor of placing long or complicated runs in ceiling void above the walk-in box.

- Escutcheons shall be provided for all refrigerant and condensate piping penetrations in walk-in walls or ceilings.
- Item sized to serve item 62 – Blast chiller.
- 3/8” Tubing coil construction.
- Adjustable pressure fan cycling control on 2 fan models.
- Anti-short cycle time delay.
- Copper tubing secured with cushion clamps.
- Discharge line temperature sensor.
- Fan guard.
- Fan motors with internal overloads.
- Pre-formed piping.
- Receiver with fusible plug and liquid shut off valve.
- Suction service valve.
- Adjustable flooded head pressure control.
- Units are shipped with Helium holding charge.
- Weatherproof electrical control box with compressor contactor and fused control circuit.
- Welded hermetic scroll compressor.
- Adjustable low-pressure control with flex hose/fixed high-pressure control.
- High efficiency enhanced copper tube and aluminum coil design.
- A2L Compatible refrigerant.
- Foam refrigerant line insulation shall not be directly exposed to weather.
- Refrigerant leak detection compliant with A2L refrigerant.
- All electrical interconnections to be completed by Refrigeration installers.
- Refrigeration installer:
 - Steve Stock and Associates:
 - 303-295-2856, Email: steve@stevestock.com

ITEM NO. 65 – BLAST CHILLER EVAPORATOR COIL
BALLY, MODEL: CUSTOM

Components: Item to be complete with all standard factory features and accessories, including the following options and modifications:

- Refrigeration from item 64.
- Designed and installed to serve item 62.
- 3/8” tubing coil construction.
- Factory installed solenoid valve wire harness.
- Heavy gauge textured aluminum cabinet construction to resist scratches/corrosion.
- NSF approved “flush to ceiling mount”.
- Unit to be shipped upright for handling and installation.
- Totally enclosed, internally protected, ball bearing motors.
- Schrader connection on suction header.
- Hinged access panels to spacious electrical and header compartments.
- Ultra efficient Electronically Commutated Motor (ECM).
- ECM with SmartSpeed technology.

- High efficiency enhanced copper tube and aluminum fin coil design.
- Compatible with A2L.
- Condensate lines shall be routed to minimize exposure to temperatures below 32 degrees. Condensate lines located within a space expected to fall below 32 degrees Fahrenheit are to be heat taped and then insulated. These lines shall also be pitched to the greatest extent possible but under no circumstance less than 1/4" per foot. Condensate lines located within space expected to fall below 32 degrees Fahrenheit may not have a trap located within the refrigerated space.

ITEM NO. 66 - WAREHOUSE WORKSTATION - MILLWORK/BY G.C.

ITEM NO. 67 - PALLET RACK

BALLY REFRIGERATED BOXERS, MODEL: CUSTOM

Components: Item to be complete with all standard factory features and accessories, including the following options and modifications:

- Three (3) tier design.
- Provide drive-under area as per plan.
- Size and configuration as shown on plan. Verify with site conditions.
- Provide and install complete 3 tier static pallet rack system per drawings.
- Provide bumpers at corners.
- Coordinate forklift configuration with system.
- Verify if fire protection is required within racking system. Coordinate and make accommodation if required.

ITEM NO. 68 - FLOOR HEATING SYSTEM

BALLY REFRIGERATED BOXERS, MODEL: CUSTOM

Components: Item to be complete with all standard factory options and accessories, including the following modifications:

- Provide and install glycol floor heating support system, with all components necessary for a complete and operational system. Verify with site conditions.
- Provide heat exchangers, refrigeration system pumps, manifolds, temperature alarm, floor temperature sensor with access hub, glycol fluid, and piping for a complete and operational system.
- See glycol shop drawings for details or routing and support equipment
- Support equipment pump, heat exchange, manifold, valves, etc. to be located in the Electrical/Glycol System Building.
- Coordinate installation with site conditions.

ITEM NO. 69-70 – SPARE NUMBERS

ITEM NO. 71 – 20 GAUGE FLASHING

CUSTOM FABRICATOR, MODEL: CUSTOM

Components: Item to be complete with all standard factory options and accessories, including the following modifications:

- Construction shall be of 304 type stainless steel, number 4 finish, not less than 22

- gauge.
- 22 Gauge Stainless Steel Wall Flashing is required from the lowest point of the finished ceiling to the top of the cove base, and full width as shown on plans. All seams and edges will be fully finished. Overlap seams or raw edges are not acceptable. Provide and install all necessary trim panels and closures, including cosmetic coverings.
- Fabrication methods shall conform to all generally accepted conventions and requirements of the food service industry and shall meet or exceed the latest National Sanitation Foundation standards including all revisions.
- Refer to design drawings for the location and shape of this item. Contractor to verify field conditions and dimensions prior manufacturing.

ITEM NO. 72-100 - SPARE NUMBER

DRAWING: FS3.1 – KITCHEN AND SERVERY

ITEM NO. 101 - HAND SINK

KROWNE, MODEL: HS-5

Components: Item to be complete with all standard factory features and accessories, including the following options and modifications:

- One piece, seamless, all welded type 304 stainless steel construction.
- Splash mount faucet with removable scrap basket.
- Add water restrictor device to faucet output spigot to reduce gpm flow rate as required by local codes or regulations.
- Wall mount bracket and hardware. Verify wall mount method with General Contractor.
- Wall backing to be provided by General Contractor per indicated on FS drawings.
- Soap and towel dispenser at this wall sink unit to be provided by Owner's supply vendor.
- Faucets and mixing valves to be certified/listed as lead free.

ITEM NO. 102 - WORK TABLE W/ SINK

EAGLE GROUP, MODEL: SMPT30108

Components: Item to be complete with all standard factory features and accessories, including the following options and modifications:

- Size and configuration per plan (34" drain board top 30" front to back x 108" long).
- 14-gauge type 304 stainless steel tabletop with 10" high back splash.
- 18" wide x 24" front to back x 12" deep integral stainless-steel sinks with welded cutting board holders (rods).
- T&S splash 3253 mount swing faucet.
- Add water restrictor devices to faucet output spigot to reduce gpm flow rate as required by local codes or regulations.
- Sinks fitted with T&S Lever type waste valve with drain lever bracket.
- 1" (25mm) dia. (stainless steel cross bracing and 1-5/8" (41mm) dia. stainless steel legs with adjustable feet with open base below sinks.

- Left and right end 18-gauge type 304 stainless steel under shelves.
- 20" x 20" x 5" NSF-approved stainless-steel drawer with full-length front pull flange.
- Removable 1/2" poly cutting board and holder and standard drawer section at right end
- Faucets and mixing valves to be certified/listed as lead free.

ITEM NO. 103 - WALL SHELF

EAGLE GROUP, MODEL: WS12108-14/3

Components: Item to be complete with all standard factory features and accessories, including the following options and modifications:

- 16-gauge stainless steel type 304 with 1-1/2" turn up at back/ends (12" x 108" long).
- Wall mount bracket and hardware. Verify wall mount method with General Contractor.
- Wall backing to be provided by General Contractor.

ITEM NO. 104 - MOBILE WORKTABLE

EAGLE GROUP, MODEL: T30108SE-CA

Components: Item to be complete with all standard factory features and accessories, including the following options and modifications:

- Size and configuration as shown on plan (35" high work top x 30" wide x 108" long).
- 14-gauge type 304 stainless steel top with rolled bull nose edge.
- Full length 18-gauge stainless under shelf with bull nose rounded edges all four sides.
- 1-5/8" diameter stainless steel legs with stem caster fitting.
- 5" resilient non-marking casters with brakes.
- (1) stainless steel drawer with lock (location as per drawing).
-

ITEM NO. 105 - SPARE NUMBER

ITEM NO. 106 - 20QT MIXER

HOBART, MODEL: HL200-10STD

Components: Item to be complete with all standard factory features and accessories, including the following options and modifications:

- 20-qt. capacity bowl – stainless steel.
- Floor model.
- Includes 3 speeds plus a stir speed
- Shift-on-the-Fly controls enable mid-cycle speed switching.
- Gear-driven transmission.
- 15-min. Smart Timer.
- No. 12 taper hub.
- Aluminum beater.
- Stainless steel wire whip.
- Stainless steel bowl resists corrosion
- Manual bowl lift
- Bowl swings out to add ingredients
- Stainless steel bowl guard helps prevent injury

- Metallic gray powder-coat finish

ITEM NO. 107 - FIRE SUPPRESSION SYSTEM FOR #108 – BY MECHANICAL CONTRACTOR

ANSUL, MODEL: R-102

Components: Item to be complete with all standard factory options and accessories, including the following modifications:

- The System shall be UL 300 Listed, installed per the Manufacturer's listing, and be capable of automatic and/or manual activation. Automatic activation shall be provided by fusible link detectors and/or a connection with another fire and/or alarm system. Manual activation shall be provided by manual pull station(s).
- Overlapping nozzle protection system.
- Manual pull station(s) to be recessed in the wall whenever possible, installed per the location shown on the drawings at a height between 42" and 48 "above the finished floor.
- Provide system design and drawings for approval prior to installation of the system.
- Exhaust hood manufacturer provides all exhaust hood penetrations, listed seals and piping in the hood. No exceptions.
- All exposed piping shall be stainless steel, chrome plated or sleeved. Run unexposed piping wherever possible. Horizontal piping within the canopy is not acceptable.
- Provide all appliances, duct and plenum protection nozzles.
- Provide (1) each single pole double throw mechanically actuated electrical switch with dry contact points rated at 28 VDC, 50 mA to be used to facilitate the connection to:
- Life Safety Alarm System signaling upon system actuation.
- Provide (3) each single pole double throw mechanically actuated electrical switch with dry contact points rated at 250 VAC, 21A to be used to facilitate the connection to:
- Shunt all electrical power in the hazard area upon system actuation.
- Shunt all electrical power to the makeup air fan and compensating air fan (if applicable) upon system actuation.
- Shunt all electrical power to the electrical gas valve if applicable upon system actuation.
- Provide an electrical gas shut off valve and reset relay to shunt the gas supply in the hazard area upon system activation. Verify the size and location of the valve with Division 22 Plumbing. Division 22 Plumbing to install the gas valve.
- Provide Y Strainer(s) with 40 mesh stainless steel screen, (for the protection of the gas shut off valve(s)), on the inlet side, as close to the valve as possible. See General Conditions Y Strainer for more details.
- Provide field distribution piping, field installed conduit, supports, and A-PC style fusible links. All field piping shall be installed by a certified and licensed contractor.
- Provide Class K fire extinguisher(s).

- Provide kitchen with durable plastic signage at each manual pull station and on each exhaust hood that identifies the associated manual pull station(s) with associated exhaust hood(s).
- Provide a full system test in the presence of the Authority Having jurisdiction (AHJ). Upon successful completion of such test and authorization from the AHJ, arm and tag the system as compliant.

ITEM NO. 108 - EXHAUST HOOD – BY MECHANICAL CONTRACTOR

CAPTIVE-AIRE, MODEL: ND-2-PSP-F

Components: Item to be complete with all standard factory options and accessories, including the following modifications:

- Construction shall be type 430 stainless steel with #4 polish where exposed.
- Individual component construction shall be determined by the manufacturer and ETL.
- Construction shall be dependent on the structural application to minimize distortion and other defects.
- All seams, joints and penetrations of the hood 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.
- Hood shall be wall type with a minimum of four connections for hanger rods.
- Connectors shall have 9/16" holes pre-punched in 1 ½" x 1 ½" angle iron at the factory to allow for hanger rod connection by KEC.
- The hood shall be furnished with U.L. classified filters, supplied in size and quantity as required by ventilator.
- The hood manufacturer shall supply complete computer-generated submittal drawings including hood sections view(s) and hood plan view(s). These drawings must be available to the engineer, architect and owner for their use in construction, operation and maintenance.
- 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.
- U.L. LED light fixtures.
- The hood shall have:
 - A double wall insulated front to eliminate condensation and increase rigidity. The insulation shall have a flexural modulus of 475 EI, meet UL 181 requirements and be in accordance with NFPA 90A and 90B.
 - An integral front baffle to direct grease laden vapors toward the exhaust filter bank.
 - A built-in wiring chase provided for outlets and electrical controls on the hood face and shall not penetrate the capture area or require an external chase way
 - The grease drain system shall be an integral part of the hood back and have a minimum 1/8" per foot slope with an exposed, removable ½ pint grease cup to facilitate cleaning.

- The hood shall be ETL Listed as "Exhaust Hood Without Exhaust Damper", ETL Sanitation Listed and built in accordance with NFPA 96. The hood shall be listed for 450°F cooking surfaces at 150 CFM/ft, 600°F cooking surfaces at 200 CFM/ft, and 700°F cooking surfaces at 250 CFM/ft. The hood shall be ETL Listed as "Exhaust Hood Without Exhaust Damper".
- 22 ga. Stainless steel wall flashing from the bottom of the hood canopy to the top of the cove base.
- Stainless steel enclosure panels to cover any gaps between the hood and building components (walls, ceiling etc.).
- Integral make up air plenum.

ITEM NO. 109 - SPARE NUMBER

ITEM NO. 110 - SPARE NUMBER

ITEM NO. 111 - FLOOR TROUGH

EAGLE GROUP, MODEL: ASFT-2430-SG

Components: Item to be complete with all standard factory features and accessories, including the following options and modifications:

- 14-gauge type 304 stainless steel 6" deep drain trough with bottom sloped to 3-1/2" drain connector (for 3" drain connection).
- All seams welded and polished to match adjacent finish.
- Stainless steel frame with anchor straps.
- Anti-splash configuration.
- With removable perforated stainless steel drain strainer.
- See plan view on FS building condition and associated detail and plumbing plan connection.
- Install and position to compliment pour path of adjacent #447 Tilting Skillet.
- Coordinate installation requirements with General Contractor.
- Prepare shop drawing for review and approval prior to fabrication of this floor through assembly.

ITEM NO. 112 - 40 GAL. TILT SKILLET

CLEVELAND RANGE, MODEL: SGL-40-T

Components: Item to be complete with all standard factory features and accessories, including the following options and modifications:

- Equipped to match utility requirements as shown on FS Series drawings.
- Open base model with adjustable stainless-steel legs.
- Full 40-gallon capacity rating to bottom of pouring lip.
- Manual hand tilt.
- Stainless steel clad 5/8" cooking surface guaranteed against warping.
- Stainless steel coved cornered pans with both gallon and liter markings.
- All stainless-steel construction.
- Adjustable, electronic thermostat controls temperature from 100°F to 425°F.
- High efficiency heating system with even heat distribution.

- Electronic spark Ignition (ESS).
- Fast heat-up and recovery time preheats in 11 minutes, full capacity from cold to boiling in 60 minutes.
- Spring-assist cover with adjustable vent and full width handle.
- On/Off Switch, thermostat knob and pilots.
- Four stainless steel, level adjustable feet, rear flanged for bolting.
- All controls are serviceable from the front of the unit.
- Two pilot lights: Green = Power on, Amber = Temperature cycling.
- Meets IPX6 water rating requirements.
- High Limit Safety Device set at 475°F.
- Anti-splash pouring lip.
- Supplied with cord and plug set (for 115-volt controls).
- Typical approvals include AGA, CSA, CE and NSF.
- Add double (DPS14), includes faucet mounting bracket.
- Food strainers for pouring spout (FS).
- Vegetable steamers (VS).
- Poaching pans (PP).
- Pan carriers (PCS).
- Rear gas connection (cap ends).
- 48" gas flex connection kit with quick disconnect coupling and restraining device.
- Gas pressure regulator.
- Faucets and mixing valves to be certified/listed as lead free.

ITEM NO. 113 - 40 GAL. STEAM KETTLES

CLEVELAND RANGE, MODEL: KGL-40-T

Components: Item to be complete with all standard factory features and accessories, including the following options and modifications:

- High efficiency power burner heating system.
- Fast heat-up and recovery time.
- Insulated heat exchanger.
- Automatic hot surface ignition system.
- Steam Jacket permanently filled with treated, distilled water.
- Venting and/or refilling not required.
- Accurate, consistent solid state temperature controls - less than $\pm 1^{\circ}\text{C}$ variance.
- Operating temperature range from 145°- 260°F.
- LED indicator for heat cycle.
- LED indicator for low water.
- Power ON/OFF dial with 1-10 temperature dial setting.
- Adjustable temperature control (C).
- 99 Minute adjustable timer setting.
- 3 Cooking Models: Cook/Simmer, Cook/On, CookOff.
- 6-Built-in self-diagnostics & display readout.
- Front mounted combination pressure/vacuum gauge.
- Type 316 stainless steel with #4 finish on kettle and supports.

- Tilt mechanism of roller bearings and case-hardened self-locking worm and segment gear.
- Support legs with level adjustable feet, flanged for floor bolting.
- Large pouring lip for easier, faster, pouring.
- Heavy-duty rolled rim design provides strong reinforcement, prevents damages from abuse.
- 50 psi steam jacket rating and safety valve.
- Supplied with cord and plug.
- Standard for natural gas operation.
- Typical approvals include AGA, CSA, CE, NSF and ASME.

ITEM NO. 114 - FIRE SUPPRESSION SYSTEM FOR #114– BY MECHANICAL CONTRACTOR

ANSUL, MODEL: R-102

Components: Item to be complete with all standard factory options and accessories, including the following modifications:

- The System shall be UL 300 Listed, installed per the Manufacturer's listing, and be capable of automatic and/or manual activation. Automatic activation shall be provided by fusible link detectors and/or a connection with another fire and/or alarm system. Manual activation shall be provided by manual pull station(s).
- Overlapping nozzle protection system.
- Manual pull station(s) to be recessed in the wall whenever possible, installed per the location shown on the drawings at a height between 42" and 48 "above the finished floor.
- Provide system design and drawings for approval prior to installation of the system.
- Exhaust hood manufacturer provides all exhaust hood penetrations, listed seals and piping in the hood. No exceptions.
- All exposed piping shall be stainless steel, chrome plated or sleeved. Run unexposed piping wherever possible. Horizontal piping within the canopy is not acceptable.
- Provide all appliances, duct and plenum protection nozzles.
- Provide (1) each single pole double throw mechanically actuated electrical switch with dry contact points rated at 28 VDC, 50 mA to be used to facilitate the connection to:
- Life Safety Alarm System signaling upon system actuation.
- Provide (3) each single pole double throw mechanically actuated electrical switch with dry contact points rated at 250 VAC, 21A to be used to facilitate the connection to:
- Shunt all electrical power in the hazard area upon system actuation.
- Shunt all electrical power to the makeup air fan and compensating air fan (if applicable) upon system actuation.
- Shunt all electrical power to the electrical gas valve if applicable upon system actuation.
- Provide an electrical gas shut off valve and reset relay to shunt the gas supply in

the hazard area upon system activation. Verify the size and location of the valve with Division 22 Plumbing. Division 22 Plumbing to install the gas valve.

- Provide Y Strainer(s) with 40 mesh stainless steel screen, (for the protection of the gas shut off valve(s)), on the inlet side, as close to the valve as possible. See General Conditions Y Strainer for more details.
- Provide field distribution piping, field installed conduit, supports, and A-PC style fusible links. All field piping shall be installed by a certified and licensed contractor.
- Provide Class K fire extinguisher(s).
- Provide kitchen with durable plastic signage at each manual pull station and on each exhaust hood that identifies the associated manual pull station(s) with associated exhaust hood(s).
- Provide a full system test in the presence of the Authority Having jurisdiction (AHJ). Upon successful completion of such test and authorization from the AHJ, arm and tag the system as compliant.

ITEM NO. 115 - SPARE NUMBER

ITEM NO. 116 - EXHAUST HOOD– BY MECHANICAL CONTRACTOR CAPTIVE-AIRE, MODEL: ND-2-PSP-F

Components: Item to be complete with all standard factory options and accessories, including the following modifications:

- Construction shall be type 430 stainless steel with #4 polish where exposed.
- Individual component construction shall be determined by the manufacturer and ETL.
- Construction shall be dependent on the structural application to minimize distortion and other defects.
- All seams, joints and penetrations of the hood 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.
- Hood shall be wall type with a minimum of four connections for hanger rods.
- Connectors shall have 9/16" holes pre-punched in 1 ½" x 1 ½" angle iron at the factory to allow for hanger rod connection by KEC.
- The hood shall be furnished with U.L. classified filters, supplied in size and quantity as required by ventilator.
- The hood manufacturer shall supply complete computer-generated submittal drawings including hood sections view(s) and hood plan view(s). These drawings must be available to the engineer, architect and owner for their use in construction, operation and maintenance.
- 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.
- U.L. LED light fixtures.

- The hood shall have:
 - A double wall insulated front to eliminate condensation and increase rigidity. The insulation shall have a flexural modulus of 475 EI, meet UL 181 requirements and be in accordance with NFPA 90A and 90B.
 - An integral front baffle to direct grease laden vapors toward the exhaust filter bank.
 - A built-in wiring chase provided for outlets and electrical controls on the hood face and shall not penetrate the capture area or require an external chase way
 - The grease drain system shall be an integral part of the hood back and have a minimum 1/8" per foot slope with an exposed, removable ½ pint grease cup to facilitate cleaning.
- The hood shall be ETL Listed as "Exhaust Hood Without Exhaust Damper", ETL Sanitation Listed and built in accordance with NFPA 96. The hood shall be listed for 450°F cooking surfaces at 150 CFM/ft, 600°F cooking surfaces at 200 CFM/ft, and 700°F cooking surfaces at 250 CFM/ft. The hood shall be ETL Listed as "Exhaust Hood Without Exhaust Damper".
- 22 ga. Stainless steel wall flashing from the bottom of the hood canopy to the top of the cove base.
- Stainless steel enclosure panels to cover any gaps between the hood and building components (walls, ceiling etc.).
- Integral make up air plenum.

ITEM NO. 117 - HAND SINK

KROWNE, MODEL: HS-5

Components: Item to be complete with all standard factory features and accessories, including the following options and modifications:

- One piece, seamless, all welded type 304 stainless steel construction.
- Splash mount faucet with removable scrap basket.
- Add water restrictor device to faucet output spigot to reduce gpm flow rate as required by local codes or regulations.
- Wall mount bracket and hardware. Verify wall mount method with General Contractor.
- Wall backing to be provided by General Contractor per indicated on FS drawings.
- Soap and towel dispenser at this wall sink unit to be provided by Owner's supply vendor.
- Faucets and mixing valves to be certified/listed as lead free.

ITEM NO. 118 - ROLL-IN COMBI OVEN

RATIONAL, MODEL: IC PRO 20-FULL SIZE

Components: Item to be complete with all standard factory features and accessories, including the following options and modifications:

- Equipped to match utility requirements as shown on FS Series drawings.
- Intended for use with full size sheet 20" x 24" pans (to be a full size combi oven). Twenty total pan capacity.
- See #78 Roll-in Rack specs for racks to be used with this oven.

- Full height roll-in oven compartment.
- Active climate management in the cooking cabinet, to constantly measures and controls the humidity and guarantees effective dehumidification, combined with high productivity, cooking quality and low energy consumption. Humidity can be adjusted in increments of 10% and monitored via the digital display for precise manual cooking.
- Dynamic air circulation in both cooking cabinets through reversing high-performance fan propellers with five fan speeds that can be programmed manually. The optimal energy yield results in excellent uniformity and short cooking times.
- High-performance steam generator for optimal steaming performance even at low temperatures below 212°F.
- Integrated, maintenance-free fat separation system without an additional fat filter.
- Cool-down function for quick cooling of the cooking cabinet via a fan propeller.
- Core temperature measurement via core temperature probe and optional positioning aid (accessories).
- Delta-T cooking for extremely gentle preparation with minimal cooking losses.
- Digital temperature display, can be set to °C or °F, displays target and actual values.
- Cooking cabinet humidity and time displayed digitally; displays target and actual values.
- Individual programming of up to 100 single or multi-stage cooking programs with up to 12 steps.
- Individual adjustment of the cooking parameters time, temperature and humidity for a program step during ongoing operation.
- Easy transfer of cooking programs to other cooking systems via USB.
- Integrated hand shower with automatic retraction and switchable spray/jet function.
- Energy-saving, long-lasting LED lighting in the cooking cabinet, with excellent color fidelity to allow quick determination of cooking progress.
- Includes with installation a no-charge 4-hour RATIONAL certified chef assistance program.
- Occupational and operating safety features.
- Electronic safety temperature limiter for steam generator and convection heating.
- Integrated fan wheel brake.
- For use of with “Green” cleaning tabs and care tabs (solid cleaning agent) for ideal occupational safety levels.
- HACCP data memory and output via USB.
- Tested according to national and international standards for unsupervised operation.
- Maximum tray height must not exceed 63 inch when using a RATIONAL mobile oven racks.
- Ergonomic door handle with right handed door opening and swing-shut function.
- Networking capability including: Integrated, IP-protected USB interface for local data exchange.
- Cleaning and care capability including:

- Automatic, water pressure-independent cleaning and maintenance system for cooking cabinet and steam generator.
- Automatic cleaning and descaling of the steam generator.
- Four cleaning programs of varying degrees for unsupervised cleaning, including overnight.
- Easy and intuitive operation of the cleaning programs: Display of the selected cleaning program, the recommended quantity of tabs and the remaining cleaning time.
- Safe ending of the cleaning in the event of a power failure with no cleaning agent left in the cooking cabinet.
- Cleaning process uses “Green” phosphate and phosphorous-free Active Green cleaner tabs and care tabs.
- Unit door with rear-ventilated double glass panel and hinged inner pane for easy cleaning.
- Cabinet inside and outside material: stainless steel DIN 1.4301
- Glass and stainless steel surfaces allow easy, safe external cleaning; IPX5-class protection against spraying water in all directions.
- Operational features including:
 - 10.1-inch TFT color display and “soft keys” for easy and intuitive operation. Operating modes and functions are visually highlighted
 - Easy operation and exact settings through a central dial with push function.
 - Acoustic prompts and visual messages when user action is required.
 - For use under a main overhead exhaust hood (not included).
 - Verify hood clearance prior to ordering.
- Installation, maintenance and environment including:
 - As part of installation, includes a professional installation by RATIONAL-certified technician.
 - Fixed waste water connection conforming to SVGW requirements is permitted.
 - Adaptation to the installation site (height above sea level) through automatic calibration.
- Operation without water softener and without additional manual descaling possible.
- Triple pane glass door with heat reflective special coating for minimal energy losses.
- Service diagnostic system with automatic service message display.
- See start up and training requirements as part of General Conditions such that Owner is aware of maintenance according to manufacturer recommendations available from RATIONAL service partners.
- Includes a standard 2-year RATIONAL warranty including parts, labor, and travel and 5-year steam generator warranty.
- Add options as follows:
 - Add optional integrated Wi-Fi interface (incl. Ethernet interface)
 - Add starter compliment of cleaning supplies including: Cleaner and care tablets
 - Add dual stage door latch to vent steam before fully opening door with integral switch.

- Add pre site survey to confirm utility requirements prior to ordering.
- Verify additional accessories required with Operator prior to ordering.
- Main power 6 foot cord and plug set. Coordinate type with Electrical Contractor.
- Rear gas connection.
- 48" gas flex connection kit with quick disconnect coupling and restraining device.
- Gas pressure regulator.

ITEM NO. 119 - SPARE NUMBER

ITEM NO. 120 - SPARE NUMBER

ITEM NO. 121 - COMBI OVEN ROLL-IN RACK

RATIONAL, MODEL: 60.22.399

Components: Item to be complete with all standard factory features and accessories, including the following options and modifications:

- Two racks total for use with I-COMBI PRO model #118 Oven-Steamer, Combi.
- Stainless steel construction
- 20 pan capacity mobile oven rack (2-1/2" spacing between pans).
- Equipped with push pull handles and casters.
- For use with 18" x 26" sheet pans as required.
- Verify exact rack type and use with Owner prior to ordering.
- Both must be compatible with #118 combi oven.
- Non-marking resilient casters adaptable for oven (highest oven temperature).

ITEM NO. 122 - WATER FILTER

RATIONAL, MODEL: 1900.1150US

Components: Item to be complete with all standard factory features and accessories, including the following options and modifications:

- Sized for use with associated appliance.
- Wall mount bracket and hardware. Verify wall mount method with General Contractor.
- Wall backing to be provided by General Contractor by FS drawings.
- As required by local code add a back flow preventer device to comply with local code.
- (2) Sets of water cartridges.

ITEM NO. 123 - DOUBLE CONVECTION OVEN

BLODGETT, MODEL: DFG200 DOUBLE

Components: Item to be complete with all standard factory features and accessories, including the following options and modifications:

- Double stacked.
- Manual solid state controls. No digital controls or temperature display.
- Commercial grade flexible gas connector.
- Gas pressure regulator.
- 5" dia. heavy-duty casters with brakes.
- Restraint device.

- Dormont caster positioning device.

ITEM NO. 124 - SPARE NUMBER

ITEM NO. 125 - SPARE NUMBER

ITEM NO. 126 - DRY STORAGE SHELVING

QUANTUM FOODSERVICE, MODEL: WR74-2448BK

Components: Item to be complete with all standard factory features and accessories, including the following options and modifications:

- Final size and configuration to fit space and as shown on plan.
- Four 24" x 48" epoxy wire shelves per shelving section.
- Four 74" black finish posts per shelving section.
- Stationary application.

ITEM NO. 127 - WALK-IN FREEZER

BALLY REFRIGERATED BOXERS, MODEL: FABRICATED

Components: Item to be complete with all standard factory features and accessories, including the following options and modifications:

- Size and configuration as shown on plan.
- 9'-8" overall height.
- 0° - (-10°) temperature range.
- Floor insulation for freezer per detail on FS3.2.
- Wall, ceiling, and floor panel insulation shall be a full 4" Class 1 foamed-in-place urethane with a K factor of at least .125. All panels to be built with 4" high density urethane structural rails at the perimeter with cam locks along each side and two cam locks at the ceilings and floor connections. Ceilings shall support a minimum 10# live load measured at L/180.
- Exposed exterior – shall be .040 stucco aluminum with baked on white finish, diamond plate to 48" above floor level.
- Exposed exterior, closure panels, and trim strips to adjacent walls shall be .040 stucco aluminum with baked on white finish. Exposed interior should be .040 stucco aluminum with baked on white finish. Unexposed exterior shall be 26-gauge stucco galvanized steel.
- Include press switch with pilot light and weather-proof cover plate. All conduits to be run concealed inside panels and stubbed through the ceiling for electrical connections.
- The exposed exterior shall be covered in 48" high above finished floor .10 aluminum diamond tread wainscoting, cut and pre-drilled for field installation by Food Service Equipment Contractor.
- Vertical closures and removable ceiling closures to be provided to seal off open air space around and above the walk-in. Closures to be constructed of same material as exposed exterior of walk-ins.
- LED interior lighting. Interior and exterior light switches. Light levels meet or exceed code (50 fc). Provide extra lighting beyond manufacturer's standards.

- Temperature alarm mounted flush with panel interior face. Basic digital display with audible temperature alarm.
- New detailed Shop Drawings for approval prior to fabrication.
- Provide 36"x 78" as shown on drawing with three hinges. Doors to include 14"x24" viewport.
- Provide strip curtains.
- Walk-in installer:
 - Steve Stock and Associates:
 - 303-295-2856, Email: steve@stevestock.com

ITEM NO. 128 - WALK IN FREEZER REMOTE REFRIGERATION
BALLY REFRIGERATED BOXERS, MODEL: BEZA025L9-HT3E

Components: Item to be complete with all standard factory features and accessories, including the following options and modifications:

- Self-contained refrigeration.
- Item is located on the top of the walk-in box (item 134).
- Refrigerant piping within the cooled space shall be minimized in favor of placing long or complicated runs in ceiling void above the walk-in box.
- Escutcheons shall be provided for all refrigerant and condensate piping penetrations in walk-in walls or ceilings.
- Item sized to serve item 127 – walk-in freezer.
- 3/8" Tubing coil construction.
- Adjustable pressure fan cycling control on 2 fan models.
- Anti-short cycle time delay.
- Copper tubing secured with cushion clamps.
- Discharge line temperature sensor.
- Fan guard.
- Fan motors with internal overloads.
- Pre-formed piping.
- Receiver with fusible plug and liquid shut off valve.
- Suction service valve.
- Adjustable flooded head pressure control.
- Units are shipped with Helium holding charge.
- Weatherproof electrical control box with compressor contactor and fused control circuit.
- Welded hermetic scroll compressor.
- Adjustable low-pressure control with flex hose/fixed high-pressure control.
- High efficiency enhanced copper tube and aluminum coil design.
- A2L Compatible refrigerant.
- Foam refrigerant line insulation shall not be directly exposed to weather.
- Refrigerant leak detection compliant with A2L refrigerant.
- All electrical interconnections to be completed by Refrigeration installers.
- Refrigeration installer:
 - Steve Stock and Associates:
 - 303-295-2856, Email: steve@stevestock.com

ITEM NO. 129 - SPARE NUMBER

ITEM NO. 130 - SPARE NUMBER

ITEM NO. 131 - WALK-IN FREEZER EVAPORATOR COIL
BALLY REFRIGERATED BOXERS, MODEL: BLP209LE-S2E

Components: Item to be complete with all standard factory features and accessories, including the following options and modifications:

- Refrigeration from item 128.
- Designed and installed to serve item 127.
- 3/8" tubing coil construction.
- Factory installed solenoid valve wire harness.
- Heavy gauge textured aluminum cabinet construction to resist scratches/corrosion.
- NSF approved "flush to ceiling mount".
- Unit to be shipped upright for handling and installation.
- Totally enclosed, internally protected, ball bearing motors.
- Schrader connection on suction header.
- Hinged access panels to spacious electrical and header compartments.
- Ultra efficient Electronically Commutated Motor (ECM).
- ECM with SmartSpeed technology.
- High efficiency enhanced copper tube and aluminum fin coil design.
- Compatible with A2L.
- Condensate lines shall be routed to minimize exposure to temperatures below 32 degrees. Condensate lines located within a space expected to fall below 32 degrees Fahrenheit are to be heat taped and then insulated. These lines shall also be pitched to the greatest extent possible but under no circumstance less than 1/4" per foot. Condensate lines located within space expected to fall below 32 degrees Fahrenheit may not have a trap located within the refrigerated space.

ITEM NO. 132 - FREEZER STORAGE SHELVING
QUANTUM FOODSERVICE, MODEL: WR74-2448BK

Components: Item to be complete with all standard factory features and accessories, including the following options and modifications:

- Final size and configuration to fit space and as shown on plan.
- Four 24" x 48" epoxy wire shelves per shelving section.
- Four 74" black finish posts per shelving section.
- Stationary application.

ITEM NO. 133 - UTILITY RACK
NEW AGE, MODEL: 1335

Components: Item to be complete with all standard factory features and accessories, including the following options and modifications:

- Bun pan rack, mobile, full height, end loading, with open sides.
- Rack accommodates twenty (18) 18" x 26" pans, slides on 3" centers.

- All welded aluminum construction.
- Includes non-marking resilient 5" platform casters.

ITEM NO. 134 - WALK-IN COOLER

BALLY REFRIGERATED BOXERS, MODEL: FABRICATED

Components: Item to be complete with all standard factory features and accessories, including the following options and modifications:

- Size and configuration as shown on plan.
- 9'-8" overall height.
- 33° - 38° temperature range.
- No floor insulation for walk-in cooler.
- Wall, ceiling, and floor panel insulation shall be a full 4" Class 1 foamed-in-place urethane with a K factor of at least .125. All panels to be built with 4" high density urethane structural rails at the perimeter with cam locks along each side and two cam locks at the ceilings and floor connections. Ceilings shall support a minimum 10# live load measured at L/180.
- Exposed exterior – shall be .040 stucco aluminum with baked on white finish, diamond plate to 48" above floor level.
- Exposed exterior, closure panels, and trim strips to adjacent walls shall be .040 stucco aluminum with baked on white finish Exposed interior should be .040 stucco aluminum with baked on white finish. Unexposed exterior shall be 26-gauge stucco galvanized steel.
- Include press switch with pilot light and weather-proof cover plate. All conduits to be run concealed inside panels and stubbed through the ceiling for electrical connections.
- The exposed exterior shall be covered in 48" high above finished floor .10 aluminum diamond tread wainscoting, cut and pre-drilled for field installation by Food Service Equipment Contractor.
- Vertical closures and removable ceiling closures to be provided to seal off open air space around and above the walk-in. Closures to be constructed of same material as exposed exterior of walk-ins.
- LED interior lighting. Interior and exterior light switches. Light levels meet or exceed code (50 fc). Provide extra lighting beyond manufacturer's standards.
- Temperature alarm mounted flush with panel interior face. Basic digital display with audible temperature alarm.
- New detailed Shop Drawings for approval prior to fabrication.
- Provide 36"x 78" as shown on drawing with three hinges. Doors to include 14"x24" viewport.
- Provide panic button.
- Provide strip curtains.
- Walk-in installer:
 - Steve Stock and Associates:
 - 303-295-2856, Email: steve@stevestock.com

ITEM NO. 135 - SPARE NUMBER

ITEM NO. 136 - WALK-IN COOLER REMOTE REFRIGERATION
BALLY REFRIGERATED BOXERS, MODEL: BEZA008H9-HT3E

Components: Item to be complete with all standard factory features and accessories, including the following options and modifications:

- Self-contained refrigeration.
- Item is located on the top of the walk-in box (item 134).
- Refrigerant piping within the cooled space shall be minimized in favor of placing long or complicated runs in ceiling void above the walk-in box.
- Escutcheons shall be provided for all refrigerant and condensate piping penetrations in walk-in walls or ceilings.
- Item sized to serve item 134 – walk-in cooler.
- 3/8” Tubing coil construction.
- Adjustable pressure fan cycling control on 2 fan models.
- Anti-short cycle time delay.
- Copper tubing secured with cushion clamps.
- Discharge line temperature sensor.
- Fan guard.
- Fan motors with internal overloads.
- Pre-formed piping.
- Receiver with fusible plug and liquid shut off valve.
- Suction service valve.
- Adjustable flooded head pressure control.
- Units are shipped with Helium holding charge.
- Weatherproof electrical control box with compressor contactor and fused control circuit.
- Welded hermetic scroll compressor.
- Adjustable low-pressure control with flex hose/fixed high-pressure control.
- High efficiency enhanced copper tube and aluminum coil design.
- A2L Compatible refrigerant.
- Foam refrigerant line insulation shall not be directly exposed to weather.
- Refrigerant leak detection compliant with A2L refrigerant.
- All electrical interconnections to be completed by Refrigeration installers.
- Refrigeration installer:
 - Steve Stock and Associates:
 - 303-295-2856, Email: steve@stevestock.com

ITEM NO. 137- WALK-IN COOLER EVAPORATOR COIL
BALLY REFRIGERATED BOXERS, MODEL: BLP10MA-S2E

Components: Item to be complete with all standard factory features and accessories, including the following options and modifications:

- Refrigeration from item 136.
- Designed and installed to serve item 134.
- 3/8” tubing coil construction.
- Factory installed solenoid valve wire harness.

- Heavy gauge textured aluminum cabinet construction to resist scratches/corrosion.
- NSF approved “flush to ceiling mount”.
- Unit to be shipped upright for handling and installation.
- Totally enclosed, internally protected, ball bearing motors.
- Schrader connection on suction header.
- Hinged access panels to spacious electrical and header compartments.
- Ultra efficient Electronically Commutated Motor (ECM).
- ECM with SmartSpeed technology.
- High efficiency enhanced copper tube and aluminum fin coil design.
- Compatible with A2L.
- Condensate lines shall be routed to minimize exposure to temperatures below 32 degrees. Condensate lines located within a space expected to fall below 32 degrees Fahrenheit are to be heat taped and then insulated. These lines shall also be pitched to the greatest extent possible but under no circumstance less than 1/4” per foot. Condensate lines located within space expected to fall below 32 degrees Fahrenheit may not have a trap located within the refrigerated space.

ITEM NO. 138 - COOLER STORAGE SHELVING

QUANTUM FOODSERVICE, MODEL: WR74-2448BK

Components: Item to be complete with all standard factory features and accessories, including the following options and modifications:

- Final size and configuration to fit space and as shown on plan.
- Four 24” x 48” epoxy wire shelves per shelving section.
- Four 74” black finish posts per shelving section.
- Stationary application.

ITEM NO. 139 - SPARE NUMBER

ITEM NO. 140 - SPARE NUMBER

ITEM NO. 141 - UTILITY RACK

NEW AGE, MODEL: 1335

Components: Item to be complete with all standard factory features and accessories, including the following options and modifications:

- Bun pan rack, mobile, full height, end loading, with open sides.
- Rack accommodates twenty (18) 18" x 26" pans, slides on 3" centers.
- All welded aluminum construction.
- Includes non-marking resilient 5" platform casters.

ITEM NO. 142 - MOBILE WORKTABLE

EAGLE GROUP, MODEL: T3096SE-CA

Components: Item to be complete with all standard factory features and accessories, including the following options and modifications:

- Size and configuration as shown on plan (35” high work top x 30” wide x 96” long).
- 14-gauge type 304 stainless steel top with rolled bull nose edge.

- Full length 18-gauge stainless under shelf with bull nose rounded edges all four sides.
- 1-5/8" diameter stainless steel legs with stem caster fitting.
- 5" resilient non-marking casters with brakes.
- (1) stainless steel drawer with lock (location as per drawing).

ITEM NO. 143 - UTILITY RACK

NEW AGE, MODEL:1335

Components: Item to be complete with all standard factory features and accessories, including the following options and modifications:

- Bun pan rack, mobile, full height, end loading, with open sides.
- Rack accommodates twenty (18) 18" x 26" pans, slides on 3" centers.
- All welded aluminum construction.
- Includes non-marking resilient 5" platform casters.

ITEM NO. 144 - TRASH CHUTE - BY GENERAL CONTRACTOR

ITEM NO. 145 - TRASH /RECYCLING CART - BY OWNER

ITEM NO. 146 - TRANSPORT CART

F.W.E., MODEL: ETC-UA-13INS

Components: Item to be complete with all standard factory features and accessories, including the following options and modifications:

- Full height.
- Insulated.
- (13) 18-in. x 26-in. bun tray or (26) 12-in. x 20-in. tray capacity.
- Holds trays on universal tray slides that can be removed.
- Adjustable slides.
- Slides are mounted on 4 1/2-in. centers.
- 1 door with a push bar handle.
- 20-ga. stainless steel exterior with 22-ga. stainless steel interior.
- 2 rigid and 2 swivel and braking casters provide mobility.
- Overall dimensions: 29 3/4 in. W x 34 in. D x 69 1/2 in. H.

ITEM NO. 147 - MOBILE WORKTABLE

EAGLE GROUP, MODEL: T30216SE-CA

Components: Item to be complete with all standard factory features and accessories, including the following options and modifications:

- Size and configuration as shown on plan (35" high work top x 30" wide x 216" long).
- 14-gauge type 304 stainless steel top with rolled bull nose edge.
- Full length 18-gauge stainless under shelf with bull nose rounded edges all four sides.
- 1-5/8" diameter stainless steel legs with stem caster fitting.
- 5" resilient non-marking casters with brakes.
- (1) stainless steel drawer with lock (location as per drawing).

ITEM NO. 148 - VACUUM SEAL MACHINE

ORVED VACUUM MASTERS, MODEL: BRIGHT 18

Components: Item to be complete with all standard factory features and accessories, including the following options and modifications:

- Countertop application.
- Operational mode: semi-automatic vacuum chamber.
- Portable.

ITEM NO. 149 – 20 GAUGE FLASHING

CUSTOM FABRICATOR, MODEL: CUSTOM

Components: Item to be complete with all standard factory options and accessories, including the following modifications:

- Construction shall be of 304 type stainless steel, number 4 finish, not less than 22 gauge.
- 22 Gauge Stainless Steel Wall Flashing is required from the lowest point of the finished ceiling to the top of the cove base, and full width as shown on plans. All seams and edges will be fully finished. Overlap seams or raw edges are not acceptable. Provide and install all necessary trim panels and closures, including cosmetic coverings.
- Fabrication methods shall conform to all generally accepted conventions and requirements of the food service industry and shall meet or exceed the latest National Sanitation Foundation standards including all revisions.
- Refer to design drawings for the location and shape of this item. Contractor to verify field conditions and dimensions prior manufacturing.

ITEM NO. 150 - HOSE REEL W/ MIXING VALVE

FISHER, MODEL: 29801/1801 (75' LONG)

Components: Item to be complete with all standard factory features and accessories, including the following options and modifications:

- 29801:
 - Wall-mount design.
 - Designed to withstand high-volume use and promotes sanitation.
 - 30' x 3/8" Reel Hose.
 - 3-Ply "Aircraft" Hydraulic Hose - Lasts three time longer.
 - 3-Ply Aircraft Hydraulic Hose - Lasts three time longer.
 - Extended Length Threaded Insert - Securely Seals Inner Hose.
 - 3/8" Female NPT Inlet.
 - Wall Mounted Reel Rinse.
- 1801:
 - Wall-mount design.
 - Stainless steel cabinet enclosure.
 - Dual check backflow preventer.
 - Water hammer silencer.
 - 90-degree panel lock with padlock hasp and finger latch.
 - 1/2-in. NPT female inlets and outlets.
 - Overall length: 14 in.

ITEM NO. 151 - HAND SINK

KROWNE, MODEL: HS-5

Components: Item to be complete with all standard factory features and accessories, including the following options and modifications:

- One piece, seamless, all welded type 304 stainless steel construction.
- Splash mount faucet with removable scrap basket.
- Add water restrictor device to faucet output spigot to reduce gpm flow rate as required by local codes or regulations.
- Wall mount bracket and hardware. Verify wall mount method with General Contractor.
- Wall backing to be provided by General Contractor per indicated on FS drawings.
- Soap and towel dispenser at this wall sink unit to be provided by Owner's supply vendor.
- Faucets and mixing valves to be certified/listed as lead free.

ITEM NO. 152- POT AND PAN SHELVING

QUANTUM FOODSERVICE, MODEL: QPM244868DR

Components: Item to be complete with all standard factory features and accessories, including the following options and modifications:

- Part of the Millennia series.
- Designed for mobile drying and organizing trays.
- Includes 4 shelf frames, 4 posts, and 3 waved, (3) 1 1/2-pronged, and (3) 2 1/2-pronged drying rack sections.
- Equipped with 4 polymer casters (2 with brakes).
- 4 donut bumpers.
- Durable gray finish for rust and corrosion resistance.
- Overall dimensions: 48 in. W x 24 in. D x 68 in. H

ITEM NO. 153 - WALL SHELF

EAGLE GROUP, MODEL: WSP-12144

Components: Item to be complete with all standard factory features and accessories, including the following options and modifications:

- 16-gauge stainless steel type 304 with 1-1/2" turn up at back/ends (12" x 144" long).
- Wall mount bracket and hardware. Verify wall mount method with General Contractor.
- Wall backing to be provided by General Contractor.

ITEM NO. 154 - THREE COMPARTMENT SINK

EAGLE GROUP, MODEL: FN2472-3-36-14/3

Components: Item to be complete with all standard factory features and accessories, including the following options and modifications:

- Size and configuration per plan
- Marine style raised tabletop front/side edges.

- 14-gauge type 304 stainless steel tabletop with 10" high back splash.
- (3) 24" wide x 24" front to back x 14" deep integral stainless-steel sinks.
- (2) Fisher splash 3253 mount swing faucets.
- (3) Fisher drain valves.
- Add water restrictor devices to faucet output spigot to reduce gpm flow rate as required by local codes or regulations.
- Sinks fitted with Fisher rotary waste valve with drain lever bracket.
- 1" (25mm) dia. (stainless steel cross bracing and 1-5/8" (41mm) dia. stainless steel legs with adjustable feet with open base below sinks.
- Left and right end 18-gauge type 304 stainless steel under shelves.
- Faucets and mixing valves to be certified/listed as lead free.

ITEM NO. 155 - SPARE NUMBER

ITEM NO. 156 - MOP SINK STORAGE CABINET

EAGLE GROUP, MODEL: F1916-VSCS

Components: Item to be complete with all standard factory features and accessories, including the following options and modifications:

- Equipped with mop rack/shelf (holds 2 mops).
- Includes standard hot/cold water service faucet.
- If required by local code, add second utility faucet for purpose of mixing and diluting chemicals.
- Stainless steel cabinet body with 20-gauge double pan access doors.

ITEM NO. 157 - WALL SHELF

EAGLE GROUP, MODEL: WSP-12108-14/3

Components: Item to be complete with all standard factory features and accessories, including the following options and modifications:

- 16-gauge stainless steel type 304 with 1-1/2" turn up at back/ends (12" x 108" long).
- Wall mount bracket and hardware. Verify wall mount method with General Contractor.
- Wall backing to be provided by General Contractor.

ITEM NO. 158 - CLEAN DISHTABLE

EAGLE GROUP, CDTR-120-14/3 MODIFIED

Components: Item to be complete with all standard factory features and accessories, including the following options and modifications:

- 16-gauge stainless steel type.
- Straight design.
- Stainless steel top, tubular legs, cross rails and feet.
- Connection to item 162 – dishwasher.
-

ITEM NO. 159 - SPARE NUMBER

ITEM NO. 160 - SPARE NUMBER

ITEM NO. 161 - VENT-UNLOAD END

EAGLE GROUP, MODEL: DVS-60

Components: Item to be complete with all standard factory features and accessories, including the following options and modifications:

- Field verify overall height from top of machine to finished ceiling
- Heavy gauge stainless steel type 304 construction with liquid tight seams.
- Coordinate final size to fit dish machine #162

ITEM NO. 162 - WAREWASHER, W/ BOOSTER HEATER

CHAMPION, MODEL: 66 PRO Electric

Components: Item to be complete with all standard factory features and accessories, including the following options and modifications:

- Perpetual rack advance system, with intuitive jam alert, and drive protection.
- Proportional rinse.
- 209 racks per hour.
- 100 GPH with energy sentinel (idle pump shut-off).
- Prodigy series HMI display, intuitive condition alerts, with user friendly cleaning and operation visual guidance, multi-lingual, touch control.
- Proactive maintenance interface, self-diagnostics, problem recognition, with repair recommendation, from HMI touch screen.
- Programmable machine dwell with automatic rack alignment into the optimal wash zone.
- Automatic drain valve.
- Single-piece stainless steel upper and lower wash arm manifolds.
- Single point electrical connection, machine and built-in booster heater.
- 20" standard vertical clearance which accommodates 18" x 26" sheet pans.
- Full 180° opening leak proof insulated hinged access doors.
- Stainless steel heavy gauge construction including base, legs and feet.
- Enclosure panels (front and sides).
- 2 HP pump motor, with stainless steel impeller.
- Factory Authorized Start-up.
- Vent fan control
- ENERGY STAR® Qualified.
- 480V service.

ITEM NO. 163 - VENT-LOAD END

EAGLE GROUP, MODEL: DVS-60

Components: Item to be complete with all standard factory features and accessories, including the following options and modifications:

- Field verify overall height from top of machine to finished ceiling
- Heavy gauge stainless steel type 304 construction with liquid tight seams.
- Coordinate final size to fit dish machine #162.

ITEM NO. 164 - PRE RINSE FAUCET

FISHER, MODEL: 34410

Components: Item to be complete with all standard factory features and accessories, including the following options and modifications:

- Stainless Steel Armor Jacket - For longer service life, Relieves tension and abrasion on inner hose.
- 16" Riser.
- 36" Prerinse Hose.
- Stainless Steel Armor Jacket - For longer service life, relieves tension and abrasion on inner hose. 3-Ply "Aircraft" Hydraulic Hose.
- 1/2" Ceramic Disk Cartridges.
- 1/2" Male NPT Inlets.
- 8" Backsplash Control Valve.

ITEM NO. 165 - SPARE NUMBER

ITEM NO. 166- DISPOSER

IN-SINK-ERATOR, MODEL: SS-200-18-AS-101

Components: Item to be complete with all standard factory features and accessories, including the following options and modifications:

- Equipped to match utility requirements as shown on FS Series drawings.
- Install at scrap sink mounted to at #171 Soiled Dish Table per plan view.
- Provide stainless steel adjustable support legs.
- AS-101 control center including timed run, post programmable water saving feature, automatic reverse feature compatible with disposer voltage/phase.
- 18" diameter bowl, 6-5/8" diameter inlet, with removable splash baffle & reversible bowl cover.
- Equipped with 2 HP motor, stainless steel construction.
- Shipped with syphon breaker, two solenoid valves, two flow control valves (all to be assembled and connected to the disposer assembly but the Plumbing Contractor.
- Power connection from rough-in to control to disposer by Electrical Contractor.
- Coordinate installation with soiled dish table fabricator including shipment of disposer cone to fabrication shop as needed to weld in cone into dish table top.

ITEM NO. 167 - DISH DOLLY

METRO, MODEL: PCD11A

Components: Item to be complete with all standard factory features and accessories, including the following options and modifications:

- Adjustable, removable towers provides total flexibility and maximum loading density.
- Handles dish sizes from 4.25" to 11.75" in diameter.

ITEM NO. 168 - DOUBLE SIDED GLASS RACK SHELF

EAGLE GROUP, MODEL: 605383 MODIFIED

Components: Item to be complete with all standard factory features and accessories, including the following options and modifications:

- Length: 84”.
- Tubular support on both ends.
- Drip tube.
-

ITEM NO. 169 - SPARE NUMBER

ITEM NO. 170 - SPARE NUMBER

ITEM NO. 171 - SOILED DISHTABLE, L SHAPED

EAGLE GROUP, MODEL: CDTCIL-120-14/3 MODIFIED

Components: Item to be complete with all standard factory features and accessories, including the following options and modifications:

- L-shape design as per FS drawings.
- Approximate size: 84” x 140”.
- Top modified at wall opening for dish drop.
- Provision for item 166.
- Provision for item 164.
- Open base with tubular legs.
- Conversion to item 162.

ITEM NO. 172 - SPARE NUMBER

ITEM NO. 173 - SPARE NUMBER

ITEM NO. 174 - SPARE NUMBER

ITEM NO. 175 - SPARE NUMBER

ITEM NO. 176 - UTILITY RACK

NEW AGE, MODEL: 1335

Components: Item to be complete with all standard factory features and accessories, including the following options and modifications:

- Bun pan rack, mobile, full height, end loading, with open sides.
- Rack accommodates twenty (18) 18" x 26" pans, slides on 3" centers.
- All welded aluminum construction.
- Includes non-marking resilient 5" platform casters.

ITEM NO. 177 - HAND SINK

KROWNE, MODEL: HS-5

Components: Item to be complete with all standard factory features and accessories, including the following options and modifications:

- One piece, seamless, all welded type 304 stainless steel construction.

- Splash mount faucet with removable scrap basket.
- Add water restrictor devices to faucet output spigot to reduce gpm flow rate as required by local codes or regulations.
- Wall mount bracket and hardware. Verify wall mount method with General Contractor.
- Wall backing to be provided by General Contractor per indicated on FS drawings.
- Soap and towel dispenser at this wall sink unit to be provided by Owner's supply vendor.
- Faucets and mixing valves to be certified/listed as lead free.

ITEM NO. 178 - PASS THRU HEATED CABINET, 2 DOOR
TURBO AIR, MODEL: PRO-50H-PT

Components: Item to be complete with all standard factory features and accessories, including the following options and modifications:

- Part of the PRO Series.
- Temperature holding range: 140-180 degrees F.
- 48.7-cu.-ft. interior space.
- Pass-thru model.
- 2 sections.
- Electric heating system.
- 6 stainless steel shelves enable storage.
- Solid doors optimize cabinet insulation.
- On/off switch.
- Doors self-close, staying open at 120 degrees.
- Door locks keep the cabinet closed after hours.
- Stainless steel exterior with galvanized steel top and bottom.
- Corrosion-resistant stainless-steel interior.
- Ducted fan air distribution system.
- LED interior lighting.
- Digital controls.
- High-density, foamed-in-place polyurethane insulation.
- 4-in. casters; 2 can be locked.

ITEM NO. 179 - SPARE NUMBER

ITEM NO. 180 - SPARE NUMBER

ITEM NO. 181 - PASS THRU REFRIGERATOR, 2 DOOR
TURBO AIR, MODEL: PRO-50R-PT-N

Components: Item to be complete with all standard factory features and accessories, including the following options and modifications:

- Part of the PRO Series.
- Interior can be accessed from either side for food to pass through.
- Product in the unit is held on 6 shelves.
- Stainless steel shelving material.

- LED lights.
- Temperature range: 33-38 degrees F.
- Oversized, balanced refrigeration system with R-290 refrigerant.
- External display.
- Self-diagnosis system interprets the condition of the refrigeration system.
- Fan motor automatically delays to save energy.
- Compressor is top mounted.
- Stainless steel interior and exterior.
- Exterior bottom, top, and back are made of galvanized steel for durability.
- Foamed-in-place polyurethane insulation.
- Easy to move with 4-in. swivel casters.
- Front casters with locks.

ITEM NO. 182 - WORK COUNTER

EAGLE GROUP, MODEL: CB3060SE-BS

Components: Item to be complete with all standard factory features and accessories, including the following options and modifications:

- 14-Gauge stainless-steel top with integral 4-1/2" boxed backsplash.
- 20-gauge stainless steel body.
- Sliding doors.
- Enclosed base.
- Stainless steel undershelf.
- 6" legs with adjustable feet.

ITEM NO. 183 - SNEEZE GUARD

PREMIER METAL & GLASS, MODEL: TM2N-EXT-A MODIFIED SIZE

Components: Item to be complete with all standard factory features and accessories, including the following options and modifications:

- Full-service sneeze guard with adjustable front glass panel.
- Brushed stainless steel posts.
- 3/8" glass.
- End panel on each end.
- Item 185 – heat lamp over heated wells.
- LED light over cold well.
- Item positioned on top of item 188 (serving counter).

ITEM NO. 184 - DROP IN HEATED WELL, 4 WELL

HATCO CORP., MODEL: HWBI-4

Components: Item to be complete with all standard factory features and accessories, including the following options and modifications:

- Item dropped into item 188 (serving counter).
- 4-hot well unit.
- Control panel built into the apron of item 188.
- Manifolded drains.
- Auto-fill.

- Hardwired into the load center in item 188.

ITEM NO. 185 - SPARE NUMBER

ITEM NO. 186 - DROP IN, COLD WELL

HATCO CORP., MODEL: CWB-3

Components: Item to be complete with all standard factory features and accessories, including the following options and modifications:

- Item dropped into item 188 (serving counter).
- Hardwired into the load center in item 188.

ITEM NO. 187 - COLD SHELF

HATCO CORP., MODEL: CSBF-24-F

Components: Item to be complete with all standard factory features and accessories, including the following options and modifications:

- Item dropped into item 188 (serving counter).
- Hardwired into the load center in item 188.

ITEM NO. 188 - FRONT COUNTER

DUKE/COUNTERCRAFT, MODEL: insignia services

Components: Item to be complete with all standard factory features and accessories, including the following options and modifications:

- Stainless steel countertop.
- Approximate size: 198" long, 36" deep, 34" high (working height).
- 10" solid stainless steel, fixed tray slide set at 32" above floor. No gap between countertop and tray slide.
- 6" legs with adjustable feet.
- Front panel extended to be terminated 2" above finished floor and act as natural kickplates.
- 3 form panels (selection by interior designer) with lighting.
- Exterior finish by interior designer.
- Stainless steel aprons with control panels and light switches.
- Provisions for drop-in hot food wells.
- Provisions for drop-in cold wells and cold shelves.
- Provisions for countertop installed sneeze guard with all accessories.
- 120/208V, 50A, 3 Phase load center to service all drop-in, countertop installed equipment.

ITEM NO. 189 - SPARE NUMBER

ITEM NO. 190 - SPARE NUMBER

ITEM NO. 191 - POS STATION - BY OWNER

ITEM NO. 192 -CASHIER STATION

DUKE/COUNTERCRAFT, MODEL: INSIGNIA SERIES

Components: Item to be complete with all standard factory features and accessories, including the following options and modifications:

- Stainless steel countertop.
- Approximate size: 30" long, 24" deep, 34" high (working height).
- 6" legs with adjustable feet.
- Tubular footrest.
- Front panel extended to be terminated 2" above finished floor and act as natural kickplates.
- 3 form panels (selection by interior designer) with lighting.
- Exterior finish by interior designer.
- Lockable drawer.

ITEM NO. 193 - HAND SINK

KROWNE, MODEL: HS-5

Components: Item to be complete with all standard factory features and accessories, including the following options and modifications:

- One piece, seamless, all welded type 304 stainless steel construction.
- Splash mount faucet with removable scrap basket.
- Add water restrictor device to faucet output spigot to reduce gpm flow rate as required by local codes or regulations.
- Wall mount bracket and hardware. Verify wall mount method with General Contractor.
- Wall backing to be provided by General Contractor per indicated on FS drawings.
- Soap and towel dispenser at this wall sink unit to be provided by Owner's supply vendor.
- Faucets and mixing valves to be certified/listed as lead free.

ITEM NO. 194 - REACH IN REFRIGERATOR

TURBO AIR, MODEL: PRO-26R-N

Components: Item to be complete with all standard factory features and accessories, including the following options and modifications:

- Part of the PRO series
- Stainless steel interior and exterior provide strength and rust resistance
- 3 stainless steel shelves
- LED interior lighting enhances product visibility
- 1-piece magnetic door gasket
- Door lock protects product from theft and tampering
- Polyurethane foam insulation retains cold air
- 4-in. swivel casters with locking front set

ITEM NO. 195 - REACH IN FREEZER

TURBO AIR, MODEL: PRO-26F-N

Components: Item to be complete with all standard factory features and accessories, including the following options and modifications:

- Part of the PRO series.
- LED lighting brightens the interior.
- Stainless steel construction resists daily wear and tear.
- 3 stainless steel shelves support product.
- (4) 4-in.-dia. swivel casters with a locking front set.
- 1 swing door has magnetic gaskets and a lock.
- Evaporator coating resists corrosion.
- Self-contained refrigeration system.
- Thermostatic expansion valve.
- Top-mounted compressor is separated from dirt and debris.
- Self-cleaning condenser supports long product life and avoids system failure.
- Foamed-in-place, high-density polyurethane insulation.
- Temperature range: -10 to 0 degrees F.
- Hot gas condensate system is corrosion resistant and prevents refrigerant leakage.
- Cold-air distribution system maintains even air flow.
- Uses R-290 hydrocarbon refrigerant.

ITEM NO. 196 - REACH IN HEATED CABINET

TURBO AIR, MODEL: PRO-26H

Components: Item to be complete with all standard factory features and accessories, including the following options and modifications:

- Part of the PRO Series
- 1-section reach-in model
- 25.4-cu.-ft. interior space
- Temperature holding range: 140-180 degrees F
- 1 solid, hinged door with locks
- Exterior constructed of 22-ga. stainless and galvanized steel for durability
- Stainless steel interior resists scratches and dents
- 3 stainless steel shelves made of wire to enable air circulation
- Digital temperature control and monitoring system
- Touch display, open-door alarm, on/off switch, self-diagnostics
- Lighting inside cabinet is LED for long service life
- Heavy-duty handles and hinges withstand heavy use
- Magnetic door gaskets are 1 piece
- Self-closing doors can stay open past 120 degrees
- Ducted fan air distribution system
- Top-mounted grille
- CFC-free polyurethane insulation is high density and foamed in place
- Positioned on 4-in. swivel casters; front casters have locks

ITEM NO. 197-200 - SPARE NUMBER

DRAWING: FS4.1 – CULINARY ARTS

ITEM NO. 201- SHELVING

QUANTUM FOODSERVICE, MODEL: WRS4-72-2436BLK

Components: Item to be complete with all standard factory features and accessories, including the following options and modifications:

- Final size and configuration to fit space and as shown on plan.
- Four 24" x 36" epoxy wire shelves per shelving section.
- Four 74" black finish posts per shelving section.
- Stationary application.

ITEM NO. 202 -REACH-IN REFRIGERATOR

TURBO AIR, MODEL: PRO-50R-N

Components: Item to be complete with all standard factory features and accessories, including the following options and modifications:

- Part of the PRO series.
- 6 stainless steel shelves.
- Heavy-duty, corrosion-resistant stainless-steel interior and exterior.
- LED interior lighting.
- Door locks.
- 1-piece magnetic door gaskets.
- Foamed-in-place, high-density polyurethane insulation.
- 4-in. swivel casters with locking front set.
-

ITEM NO. 203- REACH-IN FREEZER

TURBO AIR, MODEL: PRO-50F-N

Components: Item to be complete with all standard factory features and accessories, including the following options and modifications:

- Part of the PRO series.
- 6 stainless steel shelves.
- Heavy-duty, corrosion-resistant stainless-steel interior and exterior.
- LED interior lighting.
- Door locks.
- 1-piece magnetic door gaskets.
- Foamed-in-place, high-density polyurethane insulation.
- 4-in. swivel casters with locking front set.

ITEM NO. 204 - SECURITY SHELVING

QUANTUM FOODSERVICE, MODEL: MS2448-69SEC

Components: Item to be complete with all standard factory features and accessories, including the following options and modifications:

- Chrome-plated wire construction.
- 1 top shelf, 1 bottom shelf, and security panels.
- Lockable doors.
- 4 casters (2 with brakes) and donut bumpers.
- Overall dimensions: 48 in. W x 24 in. D x 69 in. H.

ITEM NO. 205 - THREE COMPARTMENT SINK

EAGLE GROUP, MODEL: FN2048-3-18-14/3

Components: Item to be complete with all standard factory features and accessories, including the following options and modifications:

- Size and configuration per plan
- Marine style raised tabletop front/side edges.
- 14-gauge type 304 stainless steel tabletop with 10" high back splash.
- (3) 20" wide x 16" front to back x 14" deep integral stainless-steel sinks.
- (2) Fisher splash 3253 mount swing faucets.
- (3) Fisher drain valves.
- Add water restrictor devices to faucet output spigot to reduce gpm flow rate as required by local codes or regulations.
- Sinks fitted with Fisher rotary waste valve with drain lever bracket.
- 1" (25mm) dia. (stainless steel cross bracing and 1-5/8" (41mm) dia. stainless steel legs with adjustable feet with open base below sinks.
- Left and right end 18-gauge type 304 stainless steel under shelves.
- Faucets and mixing valves to be certified/listed as lead free.

ITEM 206 – MOP SINK CABINET

Components: Item to be complete with all standard factory features and accessories, including the following options and modifications:

- Equipped with mop rack/shelf (holds 2 mops).
- Includes standard hot/cold water service faucet.
- If required by local code, add second utility faucet for purpose of mixing and diluting chemicals.
- Stainless steel cabinet body with 20-gauge double pan access doors.

ITEM 207-300 - SPARE NUMBERS

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install food service equipment level and plumb, according to manufacturer's written instructions.
- B. Connect equipment to utilities.
- C. Provide cutouts in equipment, neatly formed, where required to run service lines through equipment to make final connections. No cutting, notching, drilling, or altering of any kind will be done to the building by any Kitchen Equipment Contractor without first obtaining permission from the General Contractor.
- D. Do all cutting and fitting required on the equipment during installation and hook up. Should any repairs to food service equipment be required due to neglect of other contractors, all extra charges are to be approved, and all repairs are to be noted in writing before work is performed, stipulating the

price and to whom the extra expense is to be paid. In case the Contractor does not secure such extra order, the expense will be borne by him.

- E. Complete equipment assembly where field assembly is required.
- F. Provide closed butt and contact joints that do not require filler.
- G. Grind field welds on stainless-steel equipment smooth and polish to match adjacent finish.
- H. Ends of hollow sections shall be closed
- I. Install equipment with access and maintenance clearances that comply with manufacturer's written installation instructions and requirements of authorities having jurisdiction.
- J. Kitchen Equipment Contractor will verify all building conditions and coordinate with the General Contractor proper access of large equipment to the building prior to close of bidding. Costs for any specific items or equipment required for the movement of large, heavy or bulky equipment including rigging, cartage, etc. is solely the responsibility of the Kitchen Equipment Contractor
- K. Install cabinets and similar equipment on concrete or masonry bases in a bed of sealant as applicable.
- L. Install closure-trim strips and similar items requiring fasteners in a bed of sealant.
- M. Install joint sealant in joints between equipment and abutting surfaces with continuous joint backing, unless otherwise indicated. Produce airtight, watertight, vermin-proof, sanitary joints.
- N. Beverage system line runs of any kind and at any configuration, size, or length will be required to run through an authorized conduit system properly planned and executed through coordination with the appropriate divisions.

3.02 CLEANING AND PROTECTING

- A. After completing installation of equipment, repair damage finished.
- B. Clean and adjust equipment as required to produce ready-for-use condition.
- C. Protect equipment from damage during remainder of the construction period.
- D. Contractor will be responsible during the progress of the work to protect equipment against theft and/or damage until final acceptance by the Owner. All items delivered to the job site prior to final acceptance shall be signed for, as delivered, by the Contractor. Responsibility for safekeeping will rest with the Contractor in coordination with the Contractor's requirements.
- E. Prefabricated walk-in boxes, on-site and installed in advance of the rest of the equipment, are not to be used for general storage by other trades and should be locked by this contractor before leaving the site. It is the Contractor's responsibility to ensure proper ventilation is provided during the cleaning and

curing of masonry wearing floors inside the walk-in boxes. Damage and/or theft resulting from failure to secure boxes will be repaired/replaced at Kitchen Equipment Contractor's expense.

3.03 DEMONSTRATION

- A. Provide factory-trained engineers for start-up and demonstration of equipment. Demonstration shall be done in two stages: one for operations and the second for maintenance personnel, Refer to Division 01 for additional requirements.
- B. Return to the job site within ten (10) days after the demonstration for final adjustment and calibration of equipment.
- C. The Kitchen Equipment Contractor shall provide a trained and qualified Service Agency facility and personnel to be available within 24 hours after request by an authorized representative of the Owner to repair or replace defective equipment (as specified in section 114000) for the Warranty period without cost to the Owner's representative, including all costs such as labor, materials, parts, travel, travel time, lodging, out of pocket expenses, and other expenses, unless such service is required because of misuse, negligence, willful damage, improper maintenance or accident by other parties. Refer to other sections for further information regarding Warranty requirements

END OF SECTION 114000

SECTION 116100 – THEATRE SYSTEMS

PART 1 - GENERAL

1.01 REFERENCE TO OWNER'S GENERAL CONDITIONS

- A. The Owner's General Conditions shall be considered part of this Specification. Unless this Section contains statements, which are more definitive or more restrictive than those contained in the Owner's General Conditions, this Specification shall not be interpreted as waiving or overruling any requirements expressed in the General Conditions.

1.02 RELATED DOCUMENTS

- A. Theater Systems (TS) Drawings.
- B. Division 01 – General Requirements:
 - 1. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
- C. Division 05 – Metal Fabrication:
 - 1. The Metal Fabrication Contractor shall provide the work as specified in Division 05 and the Structural Drawings. Including: steel framing and supports for theatrical rigging systems.
 - 2. Steel shown on the Structural drawings will be provided by the Structural Contractor.
- D. Division 26 – Electrical:
 - 1. The Electrical Contractor shall provide the work as specified in Division 26, as indicated on the TS Drawings, and as specified herein.
 - 2. Electrical infrastructure (electrical j-boxes, conduit) for Theatre Systems is shown on TS Drawings and shall be the responsibility of the Division 26 Electrical Contractor.

1.03 DEFINITIONS

- A. The following shall serve as general identifiers as specified herein.
 - 1. Owner – Campbell County School District.
 - 2. Theatre Consultant – D. L. Adams Associates.
 - 3. Architect – Plan One / DLR Group.
 - 4. Contractor – The Theatre Contractor is the firm submitting a proposal to furnish and install the Work as defined within this Specification.
 - 5. Project – The Project is the Theatre Systems installation in the facilities of the New Campbell County High School.
 - 6. Work – The term "Work" means all construction and services specified within this document. The Work includes all related labor, materials, equipment, and services provided, or to be provided, by the Contractor to fulfill the proposal's obligations.
 - 7. Drawings – The term "Drawings" means all Theatre Systems Drawings and associated sketches, details, riser diagrams, etc.
 - 8. Project Location – 1000 Camel Drive, Gillette, WY.

- B. As used in the Drawings and Specifications for the Work, certain non-technical words and phrases shall be understood to have specific meanings as follows, regardless of indications to the contrary in the General Conditions or other documents governing the Work.
1. "Furnish" – Purchase and deliver to the project site complete with every necessary appurtenance and support, all as part of the Theatre Systems Work. Purchasing shall include payment of all sales taxes and other surcharges as may be required to assure that purchased items are free of all liens, claims, or encumbrances.
 2. "Install" – Unload at the delivery point at the site and perform every operation necessary to establish secure mounting and correct operation at the proper location in the project, all as part of the Work.
 3. "New" – Manufactured within the past year and never used.
 4. "Provide" – Furnish and Install.
- C. Regardless of their usage in codes or other industry standards, certain words or phrases as used in the Drawings or Specifications for the Work, shall be understood to have the specific meanings as described to them in the following list:
1. "Circuit" – Any specific run of circuitry.
 2. "Circuitry" – Any Work which consists of wires, cables, raceways, and/or specialty wiring method assemblies complete with associated junction boxes, pull boxes, outlet boxes, joints, couplings, splices, and connections except where limited to a lesser meaning by specific description.
 3. "Concealed" (as applied to circuitry) – Covered completely by building materials, except for penetrations (by boxes and fittings) to a level flush with the surface as necessitated by functional or specified accessibility requirements.
 4. "Exposed" (as applied to circuitry) – Not covered in any way by building materials.
 5. "NIC" – Not in Contract
 6. "Normal Work Conditions" – Locations within building confines that are not damp, wet, or hazardous and that are not used for air handling.
 7. "OFE" – Owner Furnished Equipment.
 8. "Patch Panel" – A System of terminal blocks, patch cords, and backboards that facilitate administration of cross-connecting cables.
 9. "Raceway" – Any pipe, duct, extended enclosure, or conduit (as specified for a particular System) which is used to contain wires, and which is of such nature as to require that the wires be installed by a "pulling in" procedure.
 10. "Standard" (as applied to wiring devices) – Not of a separately designated individual type.
 11. "Wiring" – see "Circuitry."
- D. Additional Terms:
1. The term "shall" is mandatory; the term "will" is informative; the term "should" is advisory.
 2. Where the word "conduit" is used without specific reference to type, it shall be understood to mean "raceway."
 3. The term "custom" indicates systems or components that shall be designed and fabricated by the Contractor based on the drawings and specifications.
 4. The term "future" indicates systems or components that will be added to the system later but shall be provisioned for now.
 5. The term "equal" indicates systems or equipment that is of the same size, color, design, function, efficiency, etc. as of that specified.
 6. Reference to "U.L. (Materials Construction) Standards" shall mean the "Standards for Safety" published by Underwriters Laboratories, Inc.

1.04 SCOPE OF WORK

A. General:

1. The Work as described herein shall be furnished and installed by one (1) firm alone.
2. The Contractor is responsible for furnishing the performance lighting, stage drapery, and rigging systems in order that a single contractor has the responsibility of coordinating these sub-systems into an integrated theatrical production facility. This coordination is a major responsibility of the Contractor.
3. The Contractor shall furnish and install all equipment Theatre Systems described herein.
4. Performance and house lighting control wiring shall be provided and installed by the Electrical Contractor and terminated by the Contractor.
5. It is the responsibility of the Contractor to furnish and install all steel not shown on the Structural drawings but required for a complete and operational rigging system. This includes confirming the location, orientation, and dimensions of the building steel to assure that the mounting of the stage dead-hung rigging system and motorized hoists to the building steel can be accomplished per manufacturer's recommendations. Any steel not shown on the Structural Drawings shall be provided by the Contractor as specified herein.
6. The Contractor shall provide all Work as may be required to make a complete and fully functioning system of that which may not be fully defined in the Contract Documents.
7. The Contractor shall verify the completeness of the parts list and furnish necessary accessories to execute the intent of the Drawings and Specifications.
8. The Drawings and Specifications shall be read and used together, system features which are mentioned in one are not necessarily shown in the others. It shall be understood that the Drawings, Specifications, and Equipment Lists are complementary. Where there are conflicts within the documents, request clarification.
9. The project documentation is, in general, diagrammatic and/or developed to communicate design intent. The Contractor shall coordinate the installation of all devices and/or equipment with the Owner prior to installation based on the existing field conditions.
10. The Contractor shall coordinate all installed items with associated trades (electrical, mechanical, structural, AV, telecom, etc.) including all necessary cable pass-thrus and structural needs/requirements.
11. The Contractor shall provide all software programming required to provide fully operational systems.
12. The Contractor shall provide all equipment and software programming required to provide fully operational systems.
13. The Contractor shall coordinate the specific programming requirements of the Theatre Performance Lighting Control System with a designated Owner representative, including touch screen layouts and page navigation. All programming written for this project shall be the property of the Owner and shall be provided to the Owner upon completion.

B. Related Work by Others:

1. Furnishing and installation of load wiring, control wiring, raceway, pull-boxes, and plywood backboards (provided under Electrical Work).
2. Electrical terminations of relay feeds, relay load wiring, and motorized hoist system.
3. Structural: Steel shown on the Structural drawings shall be provided by others.
4. Walkway Platforms: Shall be provided by Division 05, including installation.
5. Access Bridges and Ladders: Shall be provided by Division 05, including installation.

6. Installation and termination of building network systems.
 7. Cutting, patching, and painting of walls, unless damaged performing the Work described herein.
 8. Equipment and materials provided and installed by others, unless otherwise shown in the Drawings or this Specification, shall include but are not limited to:
 - a. Electrical Outlets.
 - b. Load Wiring.
 - c. Control Wiring.
 - d. Conduit, Raceways and Cable Trays.
 - e. Junction Boxes.
 - f. Telecommunications Outlets.
- C. Coordinated Work:
1. Contractor shall coordinate with Electrical Contractor on raceway/junction box locations for Theatre Systems equipment and routing of load wiring, and all control and power raceway from equipment, terminal and pull boxes to system equipment racks. The Contractor shall coordinate to verify the appropriate raceways are in place.
 2. Coordinate with related trades to schedule the Work and ensure a complete installation in accordance with the schedule outlined by the Owner.
 3. Coordinate all IP device requirements with the Telecom Contractor, Owner, and General Contractor.
 4. Coordinate all building network connectivity requirements with the Telecom Contractor and Owner.

1.05 GENERAL CONDITIONS

- A. The Contractor represents that they are familiar with and have expertise in the Work of this nature and scope.
- B. The Contractor shall comply with all the regulations, including safety regulations of national, city, local, and other government agencies having jurisdiction concerning the Work of the Contractor. The Contractor shall give all notices and comply with all laws, ordinances, codes, rules, and regulations bearing on the conduct of the Work. If the Contractor performs any work, which is contrary to such laws, ordinances, codes, rules, and regulations, they shall make all changes for compliance and bear all associated costs.
- C. The Contractor shall be responsible to provide and maintain a storage facility. If this storage facility is required to be on-site it shall be the Contractor's responsibility to coordinate the size and spatial requirements with the Owner. The Contractor shall assume full responsibility for the storage facility and all contents, unless otherwise indicated by the Owner.
- D. The Contractor shall provide all protection necessary to safeguard their work from damage by their operations and the operations of others. Unless the Contractor proves to the Owner's satisfaction that the Work has been damaged by others, the Contractor shall promptly repair, adjust, and clean all defective installations and bear all associated costs.

- E. All the Contractor's work shall be tested and inspected by all authorities having jurisdiction and in accordance with all Specifications. The Contractor shall coordinate and cooperate fully and shall provide at no additional cost to the Owner, manpower, drawings, facilities, scaffolds, etc. to reasonably assist the inspectors.
- F. The Owner reserves the right to furnish any materials necessary for the Project.
- G. All permits required for any part of the Contractor's work shall be procured and paid for by the Contractor. The Contractor shall determine all permits required and transmit this information to the Owner. If it is determined that the Contractor's work falls reasonably within another party's permit (General Contractor, Electrician, etc.) the Contractor shall not be required to procure additional permits provided written authorization is provided to the Contractor by the party holding the permit.
- H. The Contractor must state if they intend to utilize a subcontractor and provide said subcontractor's name and address. The subcontractor shall comply with all the same rules, regulations, laws and codes, licenses, etc. as required by the Contractor and as specified herein. The Owner reserves the right to approve or disapprove any subcontractor proposed by the Contractor.
- I. The Contractor, upon receiving notice from the Owner that the Contractor has furnished inferior, improper, or unsound work or materials (including equipment), or work or materials at variance with that which is specified, will, within twenty-four (24) hours, proceed to remove such work or materials and make good all other work or materials damaged thereby, and, at the option of the Owner, the Contractor shall immediately replace such work or materials with work or materials as specified. The removal, replacement, and repair shall be performed at such times and with manpower sufficient, in the judgment of the Owner, to avoid disturbance to occupants, or other ongoing work for the Project.
 - 1. If the Contractor does not remove such unsound Work within a reasonable time, the Owner may remove it and may store the material at the expense of the Contractor. If the Contractor does not pay the expenses of such removal within ten (10) days' time thereafter, the Owner may, upon written notice, sell such materials at auction or at private sale and shall account for the net proceeds thereof, after deducting all the costs and expenses that should have been borne by the Contractor and all expenses of the sale.
 - 2. The Owner shall always have the authority, until final completion and acceptance of the Work, to inspect and reject work and materials which in its judgment are not in conformity with the Drawings and Details, Room Data Sheets and Specifications, and its decision in regard to character and value of Work shall be final and conclusive on both contracting parties. If the Owner permits said Work or materials to remain, the Owner shall be allowed the difference in value or shall at its election have the right to have said Work or materials repaired or replaced, as well as the damage caused thereby, at the expense of the Contractor, at any time within one (1) year after the completion of the entire project, or within such longer period as may be covered by any guaranty; and neither payments made to the Contractor, nor any other acts of the Owner, shall be construed as evidence of acceptance, waiver, or estoppels.

3. Any expense incurred by the Owner in connection with the foregoing, shall be borne by the Contractor, and the Owner may withhold money due to the Contractor or recover money already paid to the Contractor, to the extent of such expense.
- J. The Drawings for the Work utilize symbols and schematic diagrams that have no dimensional significance. The Work shall be installed to fulfill the diagrammatic intent expressed on the Drawings, field layouts, and shop drawings of all trades.
 - K. The Drawings show diagrammatically the battens, suspension locations, controls, etc. So far as possible, the drawings show the arrangement of the equipment which will fit into the spaces available without interference.
 - L. The system Drawings generally indicate how the system equipment is to be integrated with other parts of the building. The Contractor shall determine exact locations by job measurements, by checking the requirements of other trades and by reviewing all contract documents.
 - M. Whenever job measurements, analysis of the Drawings and Specifications, or progress of other trades indicates that the various systems cannot be installed without significant deviation from the intent of the contract, the Theatre Consultant shall be notified immediately.
 - N. Certain details appear on the Drawings for the Work that are specified with regard to the dimensioning and positioning of the Work. These are intended only for general information purposes. They do not obviate field coordination for individual items of the indicated Work.
 - O. Information as to general construction and architectural general construction and architectural features and finishes shall be derived from the structural and architectural drawings and specifications and may require ongoing coordination with the Architect and/or Construction Team.
 - P. The Work called for under this Contract shall be carried on simultaneously with the work of other trades and Owner functions in such a manner as to not delay the overall progress of the construction project. The Contractor is responsible for all coordination of the Work with other trades.
 - Q. Include in the Work all necessary supervision and issuing of all coordination information to any other trades who are supplying work to accommodate the Theatre Systems installation. For items of equipment which are to be installed but not purchased as part of the Work, the Work shall include:
 1. Coordination of delivery: Deliver materials in manufacturer's original unopened containers with manufacturer's labels attached. Do not deliver material until spaces to receive them are clean, dry, and ready for their installation. Ship to jobsite only after roughing-in, painting, and other finishing work has been completed, installation areas are ready to accept Work.
 2. Unloading from delivery trucks: Do not deliver or install materials until spaces are enclosed and weather tight, wet work in spaces is complete and dry, HVAC system is operating and maintaining ambient temperature at occupancy levels during the remainder of the construction period.

3. Safe handling and field storage up to the time of permanent placement in the project.
 4. Correction of any damage to the item(s) caused by the Contractor.
 5. Mounting in place and connection(s) as specified.
- R. Items which are to be installed, but not purchased as part of the Work shall be carefully examined upon delivery to the project. Claims that any of these items have been received in such condition that their installation will require procedures beyond the reasonable scope of the Work will be considered only if presented in writing within one (1) week of the date of delivery to the project of the items in question. The Work includes all procedures necessary to put in satisfactory operation all items for which no claims have been submitted as outlined above.

1.06 SUMMARY

- A. This Section includes the following Theatre Systems:
1. Dead-Hung Stage Rigging.
 2. Motorized hoists for Stage Electrics.
 3. Stage Drapery and Tracks.
 4. Tormentor Positions.
 5. Performance and House Lighting Control System.
 6. Performance Lighting Instruments and Accessories.

1.07 SYSTEMS DESCRIPTIONS AND FUNCTIONS

- A. Provide all necessary labor, materials, equipment, accessories, transportation, and services required for the installation of a totally integrated technical Theatre System consisting of the following:
1. Dead-hung rigging for the following battens, including all hanging hardware and fittings required for a complete installation:
 - a. Grand Valance.
 - b. Grand Drape.
 - c. Borders 1-3.
 - d. Leg Sets 1-3.
 - e. Midstage Traveler.
 - f. Scrim.
 - g. Upstage Traveler.
 - h. Cyclorama.
 - i. Open/Spares 1-2.
 - j. Scenic Projectors (coordination with AV Contractor required).
 2. Motorized Linesets for the following battens, including all hanging hardware and fittings required for a complete installation:
 - a. Stage Electrics 1-4.
 3. The following stage drapery shall be provided:
 - a. Grand Valance.
 - b. Grand Drape.
 - c. Borders 1-3.
 - d. Leg Sets 1-3.

- e. Midstage Traveler.
 - f. Scrim.
 - g. Upstage Traveler.
 - h. Cyclorama.
4. Tracks for the following stage drapery shall be provided:
- a. Grand Drape.
 - b. Leg Sets 1-3.
 - c. Midstage Traveler.
 - d. Scrim.
 - e. Upstage Traveler.
 - f. Cyclorama.
5. Performance lighting system including theatrical lighting relay rack and control system for performance and architectural lighting fixtures shall be provided with the following features:
- a. Up to forty-eight (48) relay circuits provided in a DMX-controlled rack used for performance and work lighting.
 - b. Performance lighting circuits will be distributed to the following locations:
 - 1) Front of House Catwalk Raceways (4).
 - 2) Box Boom/Tormentor Positions (2).
 - 3) Stage Electrics (4).
 - 4) Stage Floor Boxes (6).
 - c. Work light circuits shall be provided along all Stage Electrics.
 - d. Performance Lighting Control Network: DMX512/lighting network control interfaces shall be distributed on the lighting pipe battens, distribution boxes, around the stage, and at the control position for lighting console and control of LED fixtures, intelligent lights, foggers, etc.
 - e. A network-based architectural control system shall be provided for the Auditorium and Stage.
 - 1) Button control panels shall be provided at all main entry doors. These entry stations will provide simple on/off control of general house lighting, along with stage, tormentor, sound/light lock, and catwalk work/blue lighting. The presets programmed in these stations will be optimized for general daily use.
 - 2) A wall-mounted LCD control panel will be located downstage left. The panel will provide preset lighting configurations/set-ups using a combination of house and performance lighting for simple presentations, lectures, or recitals.
 - (a) A minimum of twenty (20) presets of programming shall be provided for theatrical use on the LCD control panels, and all lighting circuits will be individually accessible (including a graphic slider for each channel, and an on/off button for each relay) from the panel for creating/saving user-defined presets. Additionally, ten (10) preset buttons shall appear on the interface for end user customization.
 - (b) The record button shall be password protected to prevent unauthorized changes to the programming.

- (c) The time-of-day clock shall be programmed to shut all lighting off after hours. Time of day programming shall be coordinated with the Owner. Provide an override button on the LCD panels that will time-out at 3:00AM, or as coordinated with the Owner.
- 3) Touchscreen GUI Development Process: The Theatre Contractor shall include two (2) touchscreen submittals and function/GUI revisions in the scope of work.
 - (a) The Theatre Contractor shall submit touchscreen GUI screen-shots with the performance lighting system shop drawing package. One (1) revision shall occur after Consultant and Owner review.
 - (b) One (1) revision shall occur after the post-construction Consultant site visit and Owner training. All touchscreen functions should be confirmed with the Owner during training.
- 4) A wireless access point shall be provided and integrated into the lighting control system. This shall allow for selected smartphones to behave as a wireless touchscreen LCD control panel using a manufacturer designed app. This app shall mirror the features of the touchscreen located on stage.
- 6. Performance Lighting Console: A professional lighting control console designed for venues using LED lighting shall be provided. In addition to keypad commands, the faders provide hands-on control of intensity and can be used to set manual levels and edit recorded cues and submasters. On demand moving light controls are available to facilitate using conventional accessories like LED fixtures, moving mirror heads, color scrollers, gobo rotators, moving lights, etc
- 7. Emergency Lighting: UL924-rated transfer equipment shall be provided for house lighting circuits requiring emergency power. 0-10V or DMX control bypass shall also be provided for these circuits as required.
- 8. Performance Lighting Fixtures:
 - a. Professional quality color-changing LED performance lighting fixture package, including PAR wash light fixtures, fixed lens ellipsoidals, zoom lens ellipsoidals, cyclorama fixtures, and follow spots.
 - b. LED work light fixtures shall be provided on Stage Electric battens.
 - c. All fixtures will be equipped with power cables, plugs, lamps, c-clamps, safety cables, 5' DMX cable, and color frames and barn doors (if appropriate).
 - d. The Contractor shall coordinate the final fixture and accessories package with designated Owner's Representative.
 - e. Contractor shall provide, install, and program initial lighting rep plot, based on final fixture package.

1.08 QUALITY ASSURANCE

A. Contractor's Qualifications:

1. The Work of this Section will be contracted to a single firm, referred to herein as the Contractor, for undivided responsibility.
2. The Contractor shall be experienced in the installation of professional theatre systems and have completed within the past five (5) years at least three (3) projects of a size and scope comparable to the project described herein.
3. The Contractor shall have factory-certified programmers for the programming of the control equipment used in this project.
4. The Contractor shall have capabilities and in-house facilities for installation, shop fabrication and repair service of the Theatre Systems.
5. The Contractor shall have at least one (1) full-time senior staff member, having five (5) years minimum experience as a theatrical systems installer who will be assigned to this installation. The senior staff member shall be an ETCP Certified Rigger – Theatre. The senior staff member shall:
 - a. Provide all technical liaison between the Contractor and the Theatre Consultant.
 - b. Be responsible for supervision of all technical and engineering work required to execute the contract, and, in particular, approve and sign all shop drawings.
 - c. Represent the Contractor at all meetings and conferences and be present at the job site for final inspection.
 - d. Be at the site during the entire installation period.

B. Qualification of Contractors:

1. All Contractors desiring to submit bids for the work specified herein must be Qualified in writing by the Theatre Consultant not less than ten (10) days prior to the bid opening.
2. Bids submitted by Contractors who have not been qualified will not be accepted.
3. Contractors not listed below, desiring to bid on this installation, shall submit the required qualification statement of Article 1.09, Paragraph B. Qualification shall be subject to Theatre Consultant's approval.
4. Pre-qualified Contractors, listed in alphabetical order, are as follows:
 - a. Barbizon Light, 2525 North Elston Avenue, D220, Chicago, IL 60647, (800) 935-3920.
 - b. Gopher Stage Lighting, 4141 Cedar Avenue, Minneapolis, MN 55407, (612) 871-0138.
 - c. Heartland Scenic Studio, 5329 Lindbergh Drive, Omaha, NE 68110, (402) 341-9121.
 - d. iWeiss Theatrical Solutions, 815 Fairview Avenue, Unit #10, Fairview, NJ 07022, (888) 325-7192.
 - e. LVH Entertainment Systems, 1600 Maxwell Drive, Suite #5, Hudson, WI 54016, (715) 377-7534.
 - f. MainStage Theatrical Supply, Inc., 907 South 1st Street, Milwaukee, WI 53204, (414) 278-0878.
 - g. Oasis Stage Werks, 249 South Rio Grande Street, Salt Lake City, UT 84101, (801) 363-0364.

- C. Minimum Performance Requirements: To meet the minimum performance requirements, the Contractor shall be responsible for the following:
1. Each component's conformance with the exemplary equipment's published specifications and other requirements as stated herein.
 2. Electrical Components: Listed and labeled per NFPA 70, Article 100 by a testing agency acceptable to authorities having jurisdiction.
 3. Safety: The dead-hung, motorized rigging, and pipe grid systems shall conform to all applicable code requirements and shall be in conformance with ESTA and USITT industry standards of operation and practices for rigging systems. All materials and arrangements shall comply with applicable performance requirements.
 4. Detailed checking of each item of equipment provided, each portion of the installation, and of the complete installation to find and remedy any defects therein.
 5. The initial adjustment of all electronic control systems, and, under the direction of the Theatre Consultant, making the final adjustment of these items.
 6. If so directed by the Theatre Consultant, the Contractor shall make final adjustments to control systems and alignment of equipment. To establish a definitive standard of performance, the systems and/or related components specified herein shall be as manufactured, supplied, and installed by the contractors listed and the exemplary equipment manufacturers listed in this specification.
- D. Applicable Standards and Codes:
1. American Hardboard Association (AHA): AHA A135.4-95: Basic Hardboard.
 2. American Plywood Association (APA): Performance Standards and Policies for Structural Use Panels.
 3. American Society of Civil Engineers (ASCE): ASCE 7 - Minimum Design Loads for Buildings and Other Structures.
 4. Architectural Woodwork Institute (AWI): Quality Manual, 8th Edition.
 5. American Standards for Testing and Materials (ASTM):
 - a. ASTM A 36/A 36M – Standard Specification for Carbon Structural Steel.
 - b. ASTM 48 – Specification for gray iron casting.
 - c. ASTM 120 – Specification for black and hot dipped zinc coated, (galvanized) steel pipe for ordinary use.
 - d. ASTM A 500 – Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.
 - e. ASTM A513 – Standard Specification for Electric-Resistance-Welded Carbon and Alloy Steel Mechanical Tubing.
 - f. ASTM A1011 – Standard Specification for Steel, Sheet and Strip, Hot Rolled, Carbon, Structural, High-Strength Low Alloy, High-Strength Low Alloy with Improved Formability, and Ultra High Strength.
 - g. ASTM B85 – Standard Specification for Aluminum Alloy Die Castings.
 - h. ASTM B209 – Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
 - i. ASTM B221 – Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
 - j. ASTM B429 – Specification for Aluminum-Alloy Extruded Structural Pipe and Tube.
 - k. ASTM C423 – Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method.
 - l. ASTM E84 – Standard Test Method for Surface Burning Characteristics of Building Materials.

- m. ASTM E 413 – Classification for Rating Sound Transmission.
 - 6. International Building Code (IBC).
 - 7. National Association of Architectural Metal Manufacturers (NAAMM): Metal Finishes Manual for Architectural and Metal Products.
 - 8. National Electric Manufacturers' Association (NEMA): NEMA LD 3-2000 – High Pressure Decorative Laminates.
 - 9. U.S. Department of Commerce, National Institute of Standards and Technology: DOC PS 1: U.S. Product Standard for Construction and Industrial Plywood.
 - 10. American Society of Mechanical Engineers (ASME).
 - 11. United States Institute for Theatre Technology (USITT).
 - 12. National Electric Code (NEC).
 - 13. NFPA International (NFPA): NFPA 701: Fire Tests for Flame-Resistant Textiles and Films.
 - 14. NFPA-79 (Electrical Standards for Industrial Machinery).
 - 15. American National Standards Institute (ANSI):
 - a. ANSI B17.1M – Keys and key seats.
 - b. ANSI B18.2.1&2 – Specification for square and hex bolts and nuts.
 - c. ANSI B106.1M – Design of Transmission Shafting.
 - d. ANSI E1.6-1 – Entertainment Technology – Powered Hoist Systems.
 - 16. Any and all applicable local governmental codes.
- E. Rigging Systems:
- 1. Theatrical rigging systems are specialized overhead suspension systems. Due to the highly specialized nature of theatrical rigging equipment, and the safety requirements of the equipment, the rigging products provided for this Work shall be the products of a single rigging manufacturer for quality, consistency, and ease of integration. Accessory items such as wire rope, fittings, and curtain tracks may be from other specialty manufacturers.
 - 2. The rigging manufacturer shall have the following programs in place:
 - a. The manufacturer shall have a product testing program, including determination of recommended working loads for products based on destructive testing and review by a licensed engineer.
 - b. The manufacturer of the performance equipment shall have a quality management system that is registered to the ISO 9001 standard.
- F. Rigging Systems, Minimum Standards of Safety, the following factors shall be used:
- 1. Cables and Fittings: 8:1 Safety Factor.
 - 2. Cable D/d ratio: Sheave tread diameter is the minimum D/d ratio per the "Wire Rope User Manual" or recommended by the wire rope manufacturer.
 - 3. Tread Pressures: 500 pounds for cast iron, 900 pounds for Nylatron, 1,000 pounds for steel.
 - 4. Steel: 1/5 of yield strength or per AISC Specification.
 - 5. Bearings: Two (2) times required load at full speed for 2,000 hours.
 - 6. Bolts: Minimum SAE J429 Grade 5 (ISO R898 Class 8.8), zinc plated.
 - 7. Motors: 1.0 AGMA Service Factor.
 - 8. Gearboxes: 1.25 Mechanical Strength Service Factor, 1.0 Gearing Service Factor.

- G. Drapery Fire-Test-Response Characteristics:
 - 1. Provide stage drapery with the fire-test-response characteristics indicated, as determined by testing identical products per test method indicated below by UL or a testing and inspecting agency acceptable to authorities having jurisdiction.
 - 2. Flame-Resistance Ratings: Passes NFPA 701.
- H. Code Compliance: All products and work shall be superior to or equal to that which is required by governing codes, ordinances, rules, and regulations.
- I. All bid proposals shall be based on materials, equipment and installation as specified herein. All deviations and exceptions to the specifications must be approved by addendum.
- J. Field Welding: Conform to ASME standards. Welders employed to be certified and recertified within the previous six (6) months for position, rods, and types of steel used in all rigging systems.

1.09 SUBMITTALS

- A. Submittals shall be in accordance with Division 01 requirements.
- B. Contractor Qualification Statement: Non-qualified contractors wishing to bid on the Work specified herein shall submit for approval, brochures bound in flexible binders containing a statement of the Contractor's qualifications. As a minimum, this submittal shall include the following:
 - 1. A list of theatres of comparable size and scope (including motorized rigging systems) to that described herein, completed by the Contractor in the last five (5) years. Show project name and address, year of completion, and the name and telephone number of a person to contract who is a representative of the Owner or User.
 - 2. A personal résumé of formal education and experience of the qualified staff engineer who would direct the Work.
 - 3. A description of the Contractor's capabilities and facilities for assembly, shop fabrication, repair, and servicing of theatre equipment.
 - 4. Certification(s) from the lighting control system manufacturer(s) certifying that the Contractor's software programmers have been factory trained and are qualified to perform the installation.
 - 5. The Contractor shall provide proof that the project supervisor holds ETCP Certified Rigger – Theatre Certification.
- C. Shop Drawing Submittals: Show fabrication and installation details for the rigging assemblies, stage drapery, steel tracks, pipe grids, motors, performance lighting system, etc. At a minimum, shop drawing submittals shall include the following and shall be submitted as a single package:
 - 1. A complete bill of material showing a list of equipment to be provided, with quantities, including those items which are to be fabricated by the Contractor.
 - 2. A complete set of manufacturers' equipment specifications with detailed technical information describing and illustrating all components and materials to be used in the installation of the systems. This set shall include items listed by manufacturer and model number and any other components needed to provide a complete functional system.
 - 3. Provide manufacturer's specification sheets for each type of product indicated.
 - 4. Plans, elevations, details, and assembly drawings.

5. Assembly drawings shall include all major components deemed necessary for review by the Theatre Consultant. All assemblies shall include weights, dimensions, and, where applicable, loads and speeds.
 6. Include information required for coordination of work by other trades.
 7. Operating clearances.
 8. Complete rigging schematics including dimensions, weights, capacities, and loads imposed by all components shall be provided.
 9. Requirements for supporting all theatrical rigging equipment. Verify capacity of each track and rigging component to support loads.
 10. Prior to submittal, the theatrical rigging system shop drawings must be approved and stamped by a licensed structural engineer, registered in the state in which the Work is being conducted.
 11. Locations of equipment components, switches, and controls. Differentiate between manufacturer-installed and field-installed wiring.
 12. One-line diagrams/schematic diagrams shall be submitted for the theatrical lighting and motorized rigging systems. Wiring diagrams shall show power, signal, and control wiring.
 13. Lighting Control Systems user interface navigation. This shall include page by page graphics and descriptions of functions for each page and each programmable button.
 14. The data furnished by the Contractor shall be sufficient to enable the Theatre Consultant to determine whether the equipment, materials, and installation the Contractor proposes to furnish comply with the requirements of this specification.
 15. The Contractor shall provide other information or materials requested by the Theatre Consultant when there is question of compliance with the intent of the Drawings and Specifications.
- D. Samples for Initial Selection:
1. The Contractor shall submit samples and color cards of drapery fabrics for color selection and approval.
 2. Include color charts showing the full range of colors, textures, and patterns available, together with a 12" square sample (any color) of each type of fabric.
 3. All samples shall be tagged, identifying grade, weight, color, manufacturer, and use.
- E. Product Certificates and Data: Manufacturer's data sheets on each product to be used, including:
1. Provide test results by certified independent testing laboratory indicating compliance with performance requirements.
 2. Rated capacities, construction details, material descriptions, dimensions of individual components, profiles, and finishes.
 3. Delivery, storage, handling, and installation instructions and recommendations.
 4. Notarized test certificates from the manufacturer on each reel of wire rope documenting the minimum breaking strength.
 5. Maintenance instructions and recommendations.
- F. Coordination Drawings: Project-specific Coordination Drawings, indicating the following items drawn and coordinated with each other. Include information required by Installers of each item to coordinate the Work. Include the following:
1. Relationship of items shown on separate Shop Drawings.
 2. Dimensions and required clearances of adjacent or related work.
 3. Order of assembly of separate items.

4. Information required for interface with other trades and components, including mechanical, electrical, and communication work.
- G. Warranty: Sample of special warranty.
- H. Closeout Submittals:
1. Operation and Maintenance Data: For adjusting, repairing, and replacing components and accessories.
 2. Troubleshooting Guide.
 3. Warranty: Submit manufacturer's warranty.
 4. After the final Consultant site visit and final punch list has been completed, submit the following O&M documents:
 - a. Operation Manual: Provide the following in a neatly bound binder with tabbed dividers between sections. Also, provide a digital copy in PDF format on a USB solid state memory drive attached to the binder.
 - 1) Title Page
 - 2) Table of Contents
 - 3) Description of each system including key features and operational concepts.
 - 4) User Operating Instructions for each of the systems.
 - 5) Setup diagrams and instructions to use in typical situations as directed by the Owner.
 - 6) Single-line block diagrams showing all major system components.
 - 7) Manufacturer's operation manuals and information sheets for equipment intended for operation by system users.
 - 8) Test certificates from manufacturers.
 - 9) Recommended Spare Parts List.
 - 10) A sheet of web links to relevant industry resources.
 - b. Maintenance Manual: Provide the following in a neatly bound binder with tabbed dividers between sections. Also, provide a digital copy in PDF format on a USB solid state memory drive attached to the binder.
 - 1) Title Sheet
 - 2) Table of Contents
 - 3) Company name, address, telephone number, e-mail address, website, and contact name for system service or maintenance
 - 4) Listing of all equipment and materials with names of manufacturers and model numbers or part numbers.
 - 5) Regular maintenance requirements.
 - 6) Product manufacturer's warranties and a typed one-year system warranty explicitly covering all materials and labor.
 - 7) Manufacturer's service manuals for all major equipment items.

- 8) A recommended preventative maintenance schedule with reference to the applicable pages in the manufacturer's maintenance manuals. Where the manufacturer provides inadequate information, provide the information necessary for proper maintenance.
- 9) Scaled PDF drawings of all system assembly drawings necessary to perform maintenance on the systems.
- 10) Provide a working copy of the latest version of all software required to operate or configure the systems specified herein.
- 11) All software shall be fully documented, and that documentation included.
- 12) Software shall be furnished on a CD-ROM or USB solid state memory drive attached to the binder.
- 13) All user definable software configurations and/or programming shall become the sole property of the Owner. This includes all source code, source code copyrights, and related documentation.
- 14) Electronic full-size drawings shall be submitted to the Owner after final acceptance. These are to be fully revised by the start-up and installation personnel to reflect the actual finished installation. The as-built drawing set is to be 100% complete including all schematics, details, and bills of material necessary to maintain and repair all of the systems.
- 15) Each drawing shall be stamped and dated "As-Built Drawing."
- 16) Any revisions or modifications during the warranty period will require that the "As-Built Drawings" be updated.
- 17) Maintain a full set of shop drawings at the project site marked up to indicate actual locations of equipment, boxes, and other items called for in this section. After the final Consultant site visit, compile the mark-ups into an electronic set of as-built drawings in AutoCAD or Revit and provide to the General Contractor, Architect, and Consultant.

- c. Training Materials: Provide two (2) DVDs and one (1) thumb drive of the recorded instruction and training sessions to document in accordance with Article 3.06.

- I. Field Quality Control Reports: Documenting inspections and demonstrations of installed products and equipment.

1.10 PROJECT CONDITIONS

- A. Field Conditions: The Contractor shall examine all attachment areas and conditions under which the theater equipment is to be installed. Notify General Contractor in writing of any conditions detrimental to the proper and timely completion of the work.
- B. Field Measurements: Verify actual dimensions of openings and construction contiguous with stage drapery, rigging, and openings by field measurements before fabrication and indicate measurements on Shop Drawings.
- C. The drawings show diagrammatically the stage and front of house electrics, motorized systems, drapery travelers, leg tracks, dead-hung pipe, pipe grids, control panels, etc. So far as possible, the drawings show the arrangement of the equipment which will fit into the spaces available without interference.
 - 1. Coordinate installation and location of blocking and supports as requested.
 - 2. Verify openings, clearances, storage requirements, and other dimensions relevant to the installation and final application.
 - 3. Where applicable, coordinate locations of electrical junction boxes.
- D. The system drawings are approximately to scale and generally indicate how they are to be integrated with other parts of the building. The Contractor shall determine exact locations by job measurements, by checking the requirements of other trades and by reviewing all contract documents.
- E. The Contractor is responsible for monitoring the progress of other trades to prevent out of sequence installation of equipment.
- F. Whenever job measurements, analysis of the drawings and specifications, or progress of other trades indicates that the various systems cannot be installed without significant deviation from the intent of the contract, the Architect and Theatre Consultant shall be notified immediately. Work in the general area shall cease until a resolution to the question has been approved.

1.11 SIGNAGE

- A. Signage with basic operating instructions and warnings shall be posted in the area where the equipment will be operated.
- B. Signage stating maximum hoist capacities:
 - 1. Maximum total superimposed weight as identified by the Structural Engineer.
 - 2. Maximum allowable weight for each dead-hung and motorized batten.
- C. Signage shall be in conformance with ANSI-Z535.

1.12 WARRANTY

- A. The Contractor shall warranty all material furnished and/or installed by them and their workmanship to be of first-class quality, and to replace or repair any defects within a period of one (1) year after date of final acceptance.
- B. Paint, exterior finishes, fuses, and lamps are excluded from the above warranty, except when damage or failure results from defective materials, workmanship covered by the warranty.
- C. Any manufacturer's warranties that exceed a period of one (1) year shall be transferred to the Owner for the remaining life of the warranty.

1.13 MAINTENANCE SERVICE CONTRACT WARRANTY

- A. Provide a written Maintenance Service Contract that contains the following:
 - 1. Replacement and/or repair of defective materials or faulty workmanship within seventy-two (72) hours of discovery at no cost to the Owner during the period of the warranty.
 - 2. Maintenance Service Contract shall be for a period of one (1) year from the final acceptance date.
 - 3. Service shall consist of at least one (1) visit six (6) months and one (1) visit eleven (11) months after final acceptance for checking the equipment and making any necessary adjustments.
 - 4. If, during this period, any system component is out of service for more than one (1) week due to unavailability of parts or service, Contractor shall supply and install an identical component. If an identical component is not available, an equivalent component shall be substituted, but only with the approval of the Owner.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. General:
 - 1. All components shall be fabricated to resist rust and corrosion. Consideration of the job site environment during installation and storage will dictate measures to ensure that all equipment is free of rust at the time of final acceptance. Rust appearing during the Warranty period shall be corrected by the Contractor at no expense to the Owner.
 - 2. All metal parts shall be free from rust, dirt, and welding spatter. All new weldments or other metal components shall receive a coat of rust inhibitor primer prior to component assembly. All assemblies shall receive a finish coat of paint. Unless specifically noted otherwise, all rigging components and equipment shall be painted a flat medium gray color.
 - 3. All materials shall be new and of first quality.
 - 4. All hoisting equipment shall be capable of supporting design loads with a minimum safety factor of 8:1. All hoisting cables shall have a breaking strength of at least eight (8) times the design load imposed.

5. All equipment shall be of bolt-up construction whenever possible. Equipment which must be welded in place shall have a welded sub-base which is bolted to the base so that the assembly may be removed for servicing by loosening bolts between the base and sub-base.
- B. Manufacturer:
1. For all equipment, materials, and products not identified by part number and manufacturer, performance specifications which are published in the most recent manufacturers' data sheets available at the time of bidding this contract shall be applicable to the present work as though fully written herein.
 2. For equipment, materials, and products not identified by part number and manufacturer, the Contractor may select items which conform to the functional and/or technical specifications. For all such items, the Contractor shall submit for approval all technical data which is available from the supplier or manufacturer. Acceptability for use in the systems shall be determined by the Theatre Consultant. Such items shall be installed only after receipt of written approval.
- C. Hardware:
1. All hardware (bolts, nuts, washers, etc.) shall be zinc or similarly plated, manufactured in the United States of America, and SAE J429 Grade 5 or better.
 2. J-bolts shall not be used for any application to the rigging system.
 3. All bolts shall be of sufficient length to extend a minimum of two (2) full threads beyond their nut.
 4. Self-locking nuts shall be used except where specific engineering reasons dictate the use of other styles. All nuts which are not self-locking shall have an appropriate lock washer.
 5. Wherever set screws are used in mounting a drum or coupling to a shaft, "Lock-Tite" or similar thread locking adhesive shall be applied to the set screw before final assembly. This thread locking adhesive shall not be the permanent type but allow for the removal of the set screw for maintenance or inspection purposes. Shafts and/or keyway keys shall be counter-bored slightly where the set screw meets the shaft or key to prevent lateral movement should the set screw loosen slightly.
 6. Hoisting hardware shall be galvanized, or zinc plated.
 7. Threaded Rod shall be 3/8" threaded rod, Unistrut HTHR037.
 8. All cable clips shall be drop forged and shall be tightened before loading and then torqued to manufacturer's specifications when cable is under load. Malleable cable clips shall not be used.
 9. Cable hardware shall have a minimum safety factor of 8:1 with respect to design load.
 10. Turnbuckles:
 - a. Turnbuckles shall be drop forged and galvanized, and conform to ASTM F-1145 Type 1, Grade 1.
 - b. Turnbuckles shall have jam nuts.
 - c. Turnbuckles shall be moused with 18- to 20-gauge copper wire, after adjustment to prevent loosening.
 11. Screw Pin Anchor Shackles:
 - a. Screw pin anchor shackles shall be drop forged and galvanized.
 - b. All shackles shall be moused with 18- to 20-gauge copper wire from the eye in the bolt to the body of the shackle.

12. Nicopress Fittings:
 - a. All compressible swage or "Nicopress" fittings shall be crimped exactly according to manufacturer's recommendations. Quantity and spacing of crimps shall be according to manufacturer's recommendations. All swage tools must be calibrated prior to beginning Work. A go/no-go type gauge shall be used to measure crimps at the beginning of calibration and after every fifty (50) cables are terminated. Ensure that tool calibration is maintained.
 - b. The dead ends of cables shall be trimmed within 3/8" of swages.
 - c. Only copper sleeves shall be used. Aluminum is not acceptable.
 13. Acceptability for use in the systems shall be determined by the Theatre Consultant. Such items shall be installed only after receipt of written approval.
- D. Friction Tape:
1. All wire ropes or synthetic ropes shall be taped with good quality friction tape prior to cutting.
 2. The dead ends of all wire ropes shall be taped snug against the live end whenever cable clips are used.
 3. Wherever compressible swage fittings are used, the entire swage shall be taped including the short dead end of the cable.
- E. Bearings:
1. All bearings shall be of the sealed or shielded variety and factory pre-lubricated. This will ensure that dust, corrosion, and lubricant leakage will be prevented.
 2. All bearing part numbers shall appear on the appropriate assembly drawing or catalog cut.
 3. Bearings for sheaves shall be rated for dynamic loads at the actual maximum RPM of each type of sheave. Bearings shall be rated for a minimum of 1.5 times the actual static load imposed.
 4. Bearings in drapery track carriers, track live-end pulleys, and dead-end pulleys are exempted from Paragraphs above.
- F. Wire Rope Cables and Lift Lines:
1. All lift cables shall be 7 x 19 stranded utility cable, meeting Federal Specification RR-W-410E, sized as required, and with breaking strengths as follows:
 - a. 1/8" diameter: 2,000 pounds
 - b. 3/16" diameter: 4,200 pounds
 - c. 1/4" diameter: 7,000 pounds
 - d. 5/16" diameter: 9,800 pounds
 - e. 3/8" diameter: 14,400 pounds
 2. All cables shall be new and free of kinks and burrs. All defective runs of cable must be replaced regardless of what caused the defect. Damaged or deformed cable shall not be used.
 3. The Contractor shall secure notarized test certificates from the manufacturer on each reel of cable documenting the minimum breaking strength. These certificates shall be part of the manual catalog cuts.
 4. All wire rope rigging shall be installed so as to prevent abrasion against any part of the building construction or other equipment.

G. Substitutions:

1. Substitutions of equal equipment, beyond product listed, will be permitted only if such equipment is listed in an addendum to this specification.
2. Address requests for inclusion of substitutions to the Theatre Consultant. Accompany any request for substitution with manufacture-measured data proving the equivalence of the proposed substitute in quality and performance. The Theatre Consultant shall be the final judge of the acceptability of submitted substitution.
3. Failure to submit a request for substitution shall automatically disqualify the manufacturers from consideration of approval.

2.02 DEAD-HUNG STAGE RIGGING SYSTEM

- A. The dead-hung rigging system is to be suspended from the building structure with 7 x 19 stranded utility cable. The cable shall be securely fastened to the structure as to support the intended loads with a minimum of 3:1 safety factor. The utility cable should be fastened to the structure in such a manner as to prevent kinking or damage to the cable. Refer to Lineset Schedule and detail of construction in TS Drawings.
- B. When using utility cable, the load end of the cable shall pass through the end link of a 4/0 passing link trim chain, by means of a properly sized thimble. The load end of the cable shall be swaged with a copper compressible swage or "Nicopress" fitting, spaced as recommended by the manufacturer. The batten trim will have adjustment capability by use of a trim chain that shall be 36" long, wrapped twice around the batten, and be fitted with a 1/4" bolt-type shackle, Crosby No. G-2130, or attached directly to the batten or track clamp using the 1/4" bolt-type shackle, or a with the use of a forged, rated, jaw and moused turnbuckle connecting to a full pipe clamp at the batten.
- C. Each pipe batten shall be supported on a maximum of 10'-0" intervals.
- D. Each drapery track shall have suspension points not exceeding maximum allowable intervals per manufacturer's recommendations.
- E. Pipe Battens:
1. Refer to Lineset Schedule on TS Drawings.
 2. Single pipe battens shall be provided for all dead-hung linesets.
 3. The batten material shall be 1-1/2", schedule 40 black steel pipe.
 4. All pipes shall be primed and painted with two (2) coats of flat black paint.
 5. A 2" wide, red stripe shall be painted around the pipe at its center and shall be centered on the stage centerline.
 6. 2'-0" at each end of the battens shall be painted yellow.
 7. Pipes shall be suspended from structural steel of stagehouse requiring the following suspension elements:
 - a. Rated, adjustable beam clamp.
 - b. Forged, rated, jaw and jaw moused turnbuckle or trim chain.
 - c. 1/4" wire rope thimble, Crosby #G-411.
 - d. 1/4" 7 x 19 stranded utility cable.
 - e. 1/4" copper compression sleeve.

- f. See TS Drawings for details of construction.
- 8. Pipe Clamp:
 - a. Shall be sized to hold 1-1/2, schedule 40 black iron pipe.
 - b. Shall have a working load of 1,250-pounds.
 - c. Shall be colored black.
 - d. Shall fully wrap/enclose pipe.
 - e. Acceptable Products:
 - 1) The Light Source Mega-Batten Clamp, MBATB.
 - 2) Approved equal.

2.03 MOTORIZED HOIST SYSTEM

- A. General:
 - 1. Hoists shall be purpose-designed and fabricated for overhead lifting of loads where people shall move beneath the suspended or moving load. The system shall incorporate mechanical, electrical, and safety features that shall be inherent to this equipment; they shall provide an engineered, efficient device for overhead lifting. The mechanical, electrical, and safety features of this hoisting and control system shall establish the standard of quality, performance, and safety by which hoisting systems of other manufacture shall be evaluated.
 - 2. Each hoist shall be fully tested under full rated load throughout its full travel distance with all its lift lines terminated to the hoist before the hoist is shipped from the manufacturer. Only hoists that successfully pass the following pre-shipment testing shall be sent to any job site. Hoists that are not tested as a complete system with the wire rope and loft blocks that will install with the hoist in the field shall not be acceptable. Testing shall include:
 - a. Hoist operation.
 - b. Hoist/motor speed.
 - c. Lift line terminations under load.
 - d. Braking and stopping under load.
 - e. Load cell function.
 - f. Slack line detection.
 - g. Position sensing.
 - h. Hoist noise.
 - 3. A record of testing and its results shall be available for review at the manufacturer's facility.
 - 4. A copy of all testing results must be furnished by the Contractor to the Architect or Owner Representative at the time of system commissioning.
 - 5. Paint as required under this section shall be the manufacturer's standard finish and color except as noted.
 - 6. All equipment items shall be new and conform to applicable provisions of Underwriters' Laboratories (UL), American Standards Association (ASA), American National Standards Institute (ANSI), National Fire Protection Association (NFPA) Life Safety Code 01, National Electric Code (NEC) and PLASA.

7. Where acceptable equipment items are specified by catalog number only, the device shall meet all published manufacturer's specifications. Where quantities or sizes are not given, refer to drawings. Where two or more products are listed, the Contractor may use either, at their discretion. Equipment shall not be substituted without specific written approval by the Architect under the substitution paragraphs of these specifications.
8. All pipe battens shall be fabricated from 1-1/2" schedule 40 steel pipe.
9. All turnbuckles and cable clips shall be drop forged.
10. All turnbuckles and clips, tracks, chains, and other items of incidental hardware shall be furnished plated or painted. Wire rope shall be galvanized. Fasteners, chain, and other miscellaneous hardware shall be zinc plated.
11. All materials used in this project shall be new, unused, and of the latest design. Refurbished materials are not permitted.
12. In order to establish minimum standards of safety, a minimum factor of 10 shall be required for all equipment and hardware used on this project. In addition, the following factors shall be used:
 - a. Cables and fittings: 10 design factor.
 - b. Cable bending ratio: 26 times diameter.
 - c. Max. fleet angle: 2 degrees.
 - d. Steel: 1/5 of yield.
 - e. Bearings: 2 times required for full 2,000 hours.
13. Hoists and compression tubes shall be mounted to the ceiling structure. The Contractor shall provide additional steel if necessary. The Contractor shall provide additional adjustment brackets and beam flange clamps in order to safely and securely mount the hoists and compression tubes.

B. Hoists:

1. Each wire rope lift line shall adhere to a design factor of 10:1 with an ultimate strength of 4,200 pounds. All load path components between the building structure and the batten shall exceed the breaking strength of the wire rope. The motor brake shall be rated at least at 125% of the motor torque.
2. The hoist shall consist of the following major components:
 - a. Powerhead.
 - b. Compression tube with beam clamps, loft blocks, lift line and lift line terminations, Right Angle Cable Adjuster (RACA).
 - c. Power/control distribution strip on the Stage Electric linesets.
3. The hoist shall include the following features:
 - a. A Powerhead containing the following elements: the gear motor, motor brake, load brake, limit switches operating electronics, load cell, slack line detector, absolute position sensors, cable drum assembly, and wire rope.
 - b. A Compression Tube that prevents motorized hoist system lateral forces from transferring to the building. Hoists or hoisting systems that impose a lateral load on the building shall not be acceptable.
 - c. The hoist shall incorporate a built-in load cell.
 - d. The hoist shall incorporate a built-in slack line sensor.
 - e. The hoist shall include the emergency contactor built into the hoist.
 - f. Hoists that do not include built-in load cell, built-in slack line detection, and an emergency contactor shall not be acceptable.
 - g. Hoists that do not use absolute position encoders shall not be acceptable.

4. The hoist shall be manufactured from UL Listed components and shall be UL Listed and tested as a complete system (not just UL listed parts).
 5. The hoists shall require the following adapter hardware to mount to the stagehouse structure:
 - a. Powerhead perpendicular height adjuster bracket 16".
 - b. Lindapter – Beam Flange Clamp.
- C. Powerhead:
1. The Powerhead shall be a fully enclosed, powder coated sheet metal housing that shall prevent contact with moving and electrical parts and shall provide protection against dirt, dust, and debris.
 2. Hoist assemblies that do not have metal housings prohibiting access to moving parts shall not be acceptable.
 3. For setup and maintenance, the following functions shall be available from the Powerhead: power and operating switches, address setting knobs, limit switch setting knobs, limit switch override button, indicators for power, status, and communication. Each of these functions shall be clearly labeled.
- D. Gearmotor and Motor Brake:
1. The gear motor and motor brake shall be an integral unit from a single manufacturer. It shall operate on 120/208V 60 Hz, 3-phase current for fixed speed units.
 2. The motor brake shall be integral to the gear motor and shall be capable of holding 125% of the motor full load torque.
 3. The motor brake shall be spring actuated to apply and hold braking force.
 4. The motor brake shall be magnetically released and held open upon actuation.
- E. Fixed Speed Hoist Load Brake:
1. The rotary disk load brake shall bring the moving load to a complete stop and shall hold the load in position in the event of a mechanical failure of the motor, motor brake, or gearbox.
 2. Noise from the load brake shall be minimally audible at any time in the operational cycle.
 3. Normal hoist operation shall not be limited by heat or noise caused by the load brake.
 4. The load brake shall be mechanically released when the load is moving in the up direction. The load brake shall close when the hoist has stopped. The load brake shall always be engaged when the load has stopped moving either up or down. When lowering the load, the load brake shall partially disengage to allow and control descent of the batten. The load brake shall remain closed in the absence of rotational torque on the gearbox.
- F. Wire Rope Drum: The drum shall be capable of wrapping up to eight (8) 3/16" diameter 7 x 19 galvanized utility wire rope lift lines up to 50'-0" long in a compact manner. They shall be managed by a wire rope (cable) keeper integral to the Powerhead. The drum design shall prevent wire rope from tangling or crossing over itself.
- G. Limit Switch: A limit switch assembly shall be mounted within the Powerhead for hard "normal" and "ultimate" end of travel limits. Hard end of travel limits shall be set/adjusted at the time of installation aided by an indicator light visible on the bottom panel of the Powerhead cover. Any system that indicates that the limit has been set by audible or tactile means only shall not be acceptable.

- H. Load Sensor/Load Profiling: A load sensor shall be built into the Powerhead to create a profile of the actual load on the hoist as it travels through its normal cycle. The profile may be changed by “re-training” the profiling system whenever the suspended load is changed on the batten by activating a key-switch operated training cycle on the motor controller. The load sensor shall continuously monitor the load when load sensing is turned on.
- I. Position Sensor: A position sensing system shall be built into the Powerhead to provide accurate position information. The system shall consist of two (2) absolute sensor types that provide accurate position information for each batten at power-up of the system. Hoisting systems that require re-homing shall not be acceptable. Incremental encoders shall not be acceptable for position readout purposes.
- J. Slack Line Detector: The slack line detector shall be built into the Powerhead. When a slack line condition in excess of 1'-3" develops in a lift line, the slack line detector shall remove power from the hoist. The batten shall be allowed to move only in the upward direction to allow removal of the cause of the slack line fault.
- K. Local User Interface to Powerhead: User interface at the Powerhead control panel at the rear of the hoist shall include:
 - 1. Hoist Up/Down Control.
 - 2. Limit Switch override buttons (tool accessible.)
 - 3. Address switches.
 - 4. Status LEDs.
- L. Information Storage Within Powerhead:
 - 1. Record of severe fault conditions with date and time stamp.
 - 2. Record of E-stops, overloads, moves and power cycles.
 - 3. Record of travel distance and peak loads since installation/inspection.
- M. Compression Tube and Beam Clamps:
 - 1. The Compression Tube shall be a continuous channel of extruded aluminum engineered in conjunction with the beam clamps to neutralize rigging-generated lateral forces on the building.
 - 2. The Compression Tube shall support the system loft blocks.
 - 3. Compression Tube sections shall be joined into a continuous assembly by a pair of dedicated splicing plates at each tube joint.
 - 4. The Compression Tube shall be installed only by means of dedicated beam clamps that allow the Compression Tube to snap into place and to fractionally move horizontally under load.
 - 5. Beam clamps shall be capable of attaching to horizontal beams, joists, truss flanges or flat steel plates measuring from 1/4" thick up to 1" thick and from 4" wide up to 14" wide placed no more than 14'-0" apart. Support structures must be deemed sufficient by a structural engineer to support any forces imposed by the hoisting systems. Beam clamps shall accommodate up to 1/2" vertical misalignment.

N. Loft Blocks:

1. Each loft block shall be an assembly of steel side plates, a wire rope idler, sheave, bearings, shaft locked against rotation, and support hardware. Each loft block shall be inserted into the slot on the bottom of the Compression Tube. The blocks shall be positioned no closer than 4'-0" from each other, unless muled.
2. Loft block sheaves shall measure 5" in diameter and contain a pair of press fit sealed ball bearings. Lift lines shall travel in a groove shaped and sized for 3/16" diameter wire rope per the latest edition of the Wire Rope Users' Manual as published by the Wire Rope Technical Board. The loft block sheave shall be concentric about the hub and shall be evenly balanced for ease of rotation.
3. An idler shall be incorporated into the top assembly of the loft block to guide and support lift lines as they pass the block.

O. Lift Line Terminations:

1. Each lift line shall be terminated in the Powerhead via a standard copper oval compression sleeve installed/crimped at the factory.
2. Lift lines shall be terminated at the load hanger with a low-profile RACA, thimble and copper oval compression sleeve. The RACA and cable terminations at the batten shall be installed at the time of hoist installation.
3. Batten trim shall be adjustable up to 6" via the RACA.
4. Systems utilizing turnbuckles or chain to trim the batten shall not be accepted for this installation.

P. Hangers: Raceway hangers shall be specially shaped flat bar that shall support the wire rope termination hardware and secure the raceway and the pipe batten.

Q. Cable Management for Stage Electrics:

1. The load circuits and control wiring shall be fed to the distribution trough by a built-in cable management system that allows flat feeder cable to fold and store along the top of the connector strip.
2. At high trim, the entire system shall be stored in 52" of vertical space from the bottom of the mounting steel to the horizontal centerline of the batten.
3. The cable management system shall be integral to the hoist system.
4. The cable management system shall be UL LISTED.
5. The flat cable shall meet the physical as well as thermal requirements of UL for 20 Amp loads. Up to four (4) flat cables may be fed from each end of the distribution system to provide power for twenty-four (24) circuits from each end of the system for a maximum of forty-eight (48) total circuits.
6. Each flat cable shall include one (1) ground wire and one (1) data cable plus an individually insulated hot and an individually insulated neutral conductor for each of six (6) 120 Volt, 20 Amp circuits.
7. The connector strip shall be built to the length specified with outlets and/or pigtails located as specified or as shown on the construction drawings. Outlets or plugs shall be 15 Amp twist lock connectors. The distro trough shall also contain connectors for DMX connections.
8. Flat cable shall pass through a strain relief before entering a termination box at the designated end of the raceway. Within the raceway all wiring shall be attached at the factory to a terminal block. The flat cable, internal wiring and all components shall meet UL requirements and appropriate National Electrical Codes (NEC.)

9. Hoisting systems utilizing cable management systems from third-party vendors shall be fully integrated into the hoisting system without additional structural changes or changes to the QuickTouch controller. Electricians shall install hoisting systems that do not fully integrate cable management in the hoisting system and controller shall not be acceptable for this installation. Cable management systems that are not UL LISTED shall not be accepted for this installation.
- R. Pipe Batten:
1. The pipe batten shall be 1-1/2", schedule 40 grade A, seamless pipe fabricated in the largest possible lengths without splices. Battens of greater length shall be spliced by means of .120 x 1 9/16 dia. DOM tube 18" long with 9" of tube inserted into each half of the splice. The tight-fitting splice tube shall be held in place by a pair of 3/8" x 2-1/2" Grade 5 hex bolts on each side of the joint. The bolts shall pass through the pipe at an angle of 90° to each other. There shall be two (2) bolts on each side of the joint spaced 1" and 8" from the joint. Alternatively, one (1) pair of bolts on one (1) side of the joint may be replaced with either plug welds or tight-fitting steel rivets. Pipes shall be straight and painted flat black.
 2. A safety-yellow batten cap shall be installed at each end of each pipe batten.
 3. The manufacturer shall provide up to four (4) self-adhesive labels for each batten on which the rated batten load shall be written by the installer.
- S. Power and Control Distribution (PCD):
1. Each hoist shall receive power and control via a pair of 8'-0" long cables extending from the Powerhead to the source outlets. Receptacles shall be installed in a sheet metal junction box and trough with outlets. Each outlet shall be located no more than 6'-0" away from the rear face of each hoist.
 2. Each Powerhead shall include a power cord hardwired to the hoist with an appropriately sized grounded twist lock connector at the PCD end and a removable control cable with a circular 9-pin connector at each end. An appropriately rated 3-phase breaker in the PCD shall be included. The wiring and connectors shall be barriered between high and low voltage.
 3. The power/distribution channel shall be UL LISTED for this application.
- T. Control System:
1. General:
 - a. The entire motor system shall be operated by a fixed speed controller. It shall be purpose-designed and fabricated to manage and operate motors specifically designed for overhead lifting. Each system shall incorporate mechanical, electrical, and safety features that shall be inherent to this equipment and shall provide an engineered, efficient device to control the equipment. The mechanical, electrical, and safety features of this control system shall establish the standard of quality, performance, and safety by which motoring systems of other manufacture shall be evaluated.
 - b. Control system shall be UL Listed and fabricated from UL Listed components.
 - c. The Control System shall consist of a flush-mounted primary control panel located stage right and one (1) remote E-stop station located stage left.
 - d. The motoring system shall also include one (1) Fixed Speed Remote control device with 50'-0" of flexible cable that may be attached to the system at the control panel.

- e. The controller shall include the following features:
 - 1) Key operated power switch.
 - 2) LCD display for feedback/operating information.
 - 3) Key operated motor load profile training/enable switch.
 - 4) Latching motor selection buttons with backlit naming tabs.
 - 5) Backlit hold-to-operate, dead-man, up and down buttons.
 - 6) Recessed speed adjustment slide-pot.
 - 7) Rotary data entry encoder.
 - 8) Dedicated E-Stop button.
 - 9) Outlet for wired remote.
 - 10) Locking door.
 - f. The control system shall only employ the controller, a power and control distribution infrastructure, and the motors. Separate drive cabinets or motor-starters is not acceptable.
2. Enclosure:
- a. The backbox and face panel shall be fabricated from 16-gauge powder coated sheet steel specially formed to provide support for installation as well as support for all components installed within the housing.
 - b. The face panel shall be a steel panel with labels identifying function of buttons on control station.
 - c. The face panel shall identify the system as a controller for motorized stage rigging.
 - d. The face panel shall be shades of grey. The ring surrounding the E-stop button shall be safety yellow and shall be rear illuminated.
 - e. The steel panel to which all switches are mounted shall be removable via screws in the surface located underneath the face panel film.
3. LCD Screen:
- a. The liquid crystal display shall be purpose designed to communicate all information in human readable text.
 - b. The screen shall be rear illuminated and shall be dimmable.
 - c. During system start up the screen shall show the progress of the motors diagnostics self-tests. Upon completion of the startup sequence the screen shall indicate that the system is "OK" or shall provide specific information should a fault be detected. Fault conditions shall be reported in human readable text. Systems that report fault conditions in a series of blinking lights shall not be acceptable for this installation.
 - d. When a motor is selected the LCD screen shall readout the motor name or number, its current position above the floor, the amount of weight suspended from the batten, the preset position that is recorded, as well as a bar graph scale that shows the current position of the motor, top and bottom limits and the current weight suspended from the motor.
 - e. Display language shall be English.

4. Motor Selection/Operation Buttons shall be backlit when motor is selected.
5. Key Switches:
 - a. A key switch shall control power to the control system. The key must be in the lock and the key turned to the "ON" position for the motoring system to operate.
 - b. A separate key is required to turn on the load profiling system. That key must be in the lock and turned to the "ON" position for load profiling to function.
 - c. When load profiling is turned on the motor shall know the amount of weight that is supposed to be supported by the batten at any location in the path of travel. Should the weight exceed or be reduced below the profiled weight by a preset value, the motor shall stop operation until the fault is cleared.
6. Slack Line Detector: The slack line detector is located in the Powerhead. When a slack line condition occurs, it shall cease motor movement and result in a fault message on the LCD screen on the controller. Movement in the upward direction shall be possible to clear the fault.
7. Emergency Stop:
 - a. The E-stop button on the controller shall be a hardwired NFPA-79 compliant mushroom button with illuminated ring surrounding button. During normal operation, the E-stop button shall be in the out position. An E-stop can be activated via this button by firmly pressing the button in. The button shall latch and immediately cause a class zero stop of all motors in the system. The LCD screen shall report this as an E-stop fault. To continue system operation the E-stop button must be cleared by twisting the button to release the latch. Power to the control station must be cycled off/on to re-initiate the system. This action shall also initiate a self-test of the entire control system and contactors.
 - b. The illuminated ring around each E-stop button shall be dimmable. The status of the lighted ring shall provide additional information about the state of the system as follows:
 - 1) Ring at low intensity: no motor(s) moving.
 - 2) Ring at high intensity: motor(s) moving.
 - 3) Ring blinking: system in E-stop condition.
 - c. One (1) remote E-stop station shall be connected to the system and located on the stage left wall. The remote E-stop station shall operate in the same way as the primary E-stop at the control panel.
 - d. Software or serial bus E-Stop systems are not acceptable.
8. System Diagnostics:
 - a. Upon energization, the control system shall perform an automatic series of diagnostic tests that assure that all system safety functions are working. Should an error in the safety functions be determined, the controller shall report back a fault condition in the LCD display window and shall identify the nature of the fault.
 - b. Monthly, the system automatically shall perform an additional series of diagnostic tests to determine if there are any problems with any portion of the motor control system safety features. In the event of a problem, the controller shall report back a fault condition in the LCD display window and shall identify the nature of the fault.
 - c. Eleven (11) months after a system inspection has been performed, the system shall remind the user to schedule full system maintenance/inspection. The reminder shall remain in the system with a count-down calendar until it is turned off by the factory authorized and trained inspector.
 - d. System and Individual Motor History shall be provided by the System Diagnostics.

- e. The Contractor shall be able to leave contact information within the system. This information shall be displayed at power up and in the event of severe fault conditions.
- 9. Trim Positions: Store or delete up to five (5) trim positions per motor.
- 10. Remote Control Pendant:
 - a. A remote-control pendant with 50'-0" long attached cable and plug shall be provided for the system. The remote control must be plugged into the motorized hoist control station. When the remote control is plugged in the E-stop on the remote is active. Systems requiring "shunt plugs" to bypass an unplugged remote-control connector shall not be acceptable.
 - b. The remote control provides up/down control for those motors that have been preselected at the motorized hoist control station.
- 11. System Commissioning: Motorized rigging system shall be capable of commissioning basic system functionality without a laptop computer or additional software.
- U. Acceptable Products:
 - 1. ETC Prodigy P1500E with power/control wiring cable management. This shall include the following components:
 - a. ETC QuickTouch+ Controller (QT+ MK2 12CH).
 - b. Flush backbox (QT-FBB-LG).
 - c. Locking Door (QT-D-LG).
 - d. Fixed-Speed Remote Control, wired (FSRC).
 - e. Emergency-Stop Button Station (ESBS MK2).
 - f. Emergency Stop Button Station Guard (ESBSG).
 - 2. Approved equal.

2.04 DRAPERY

- A. Furnish and install the following drapery in the Stage:
 - 1. Grand Valance.
 - 2. Grand Drape.
 - 3. Borders 1-3.
 - 4. Leg Sets 1-3.
 - 5. Midstage Traveler.
 - 6. Scrim.
 - 7. Upstage Traveler.
 - 8. Cyclorama.
- B. General: Provide fabrics inherently and permanently flame resistant or chemically flame resistant by immersion treatment to comply with requirements indicated. Provide fabrics of each type and color from same dye lot.
 - 1. The Contractor shall furnish notarized affidavits certifying that such fabrics have been tested in accordance with NFPA 701, Standard Method of Fire Tests for Flame Resistant Textiles and Fibers, and that such fabrics have been used exclusively in the draperies and fabrics furnished, if required by the Architect.

2. All drapery shall have a permanently attached label at the bottom hem which is visible and convenient for identification by the Authority having jurisdiction after installation. The label shall include the name of the drapery manufacturer, product or style of fabric, date of manufacture, list of fire tests, testing agency, and whether fabric is inherently and permanently flame resistant or treated with flame-retardant chemicals, and whether it requires retreatment after designated time-period or cleaning.

- a. A cloth statement shall be sewn to the hem of each velour drape, lining, and scrim with the following information printed on it:

CERTIFICATE OF FLAME RETARDANCE: This is to certify that the total yards of material as supplied by____, Mill Order No.____, Invoice Number____, dated____, consisting of _____pieces, is inherently flame retardant. The material was tested by the laboratory for satisfactory results before the shipment went forward. Certified by: _____.

- b. Cyclorama: A cloth statement shall be sewn to the header of the cyclorama drape with the following information printed on it:

CERTIFICATE OF FLAME RETARDANCE: This is to certify that the total yards of material as supplied by _____, Mill Order No. _____, Invoice Number____, dated____, consisting of _____pieces was flameproofed by the immersion process through pressure rollers. The flameproofing chemicals were applied in accordance with the instructions of the manufacturer and tested by the laboratory for satisfactory results before the shipment went forward. Certified by: _____

3. Spray processing is not acceptable.

C. Fabrics:

1. Polyester Velour:
 - a. Napped fabric of 100% polyester weighing not less than 25 oz./linear yd., with pile height approximately 75 mils; inherently and permanently flame resistant; 54" width.
 - b. Exemplary Products: Rose Brand; Charisma.
 - c. Color: per Line Set Schedule in TS Drawings.
2. Polyester Lining:
 - a. 100% polyester fabric; inherently and permanently flame resistant; 54" minimum width.
 - b. Exemplary Products: Avora Lining, or approved equivalent.
 - c. Color: Black.
3. Sharkstooth Scrim: Open-weave, seamless, lightweight gauze fabric.
 - a. 100% polyester, inherently flame-resistant resin coated scrim, 44'-0" width.
 - b. Color: Black.
4. Muslin: Sheer, plain-woven fabric:
 - a. 100% cotton, seamless, weighing 99.2 oz./linear yd.; flame resistant, 48-0" width.
 - b. Color: Natural.

D. Fabrication:

1. General: Draperies are to be fabricated in the sizes and fabrics shown in the Lineset Schedule. Draperies are to be stitched with thread matching the color of the drapery using a single needle lock stitch.
2. Provide vertical seams unless otherwise indicated. Arrange vertical seams so they do not fall on faces of pleats. Do not use fabric cuts less than one-half width.
3. Vertical Hems: Provide vertical hems not less than 2" wide, and not less than 4" wide at grand valance, borders, teasers, and tormentors, with not less than a 1" tuck, and machine sew with no selvage material visible from front of curtain. Sew open ends of hems closed.
4. Leading edge turnbacks at the center and off-stage edges: Provide turnbacks formed by folding back not less than 12" of face fabric, with not less than a 1" tuck, and secure by sewing turnbacks vertically.
5. Top Hems: Reinforce top hems by double stitching 3" wide polyester webbing, to top edge on back side of curtain with not less than 2" of face fabric turned under.
6. Pleats:
 - a. Grand Valance and Grand Drape: Provide 100% fullness in draperies, exclusive of turnbacks and hems, by sewing additional material into 6" double-stitched box pleats sewn flat and spaced at 12" on center along top hem reinforcement.
 - b. All other velour drapery: Provide fullness indicated in Lineset Schedule in TS Drawings.
7. Grommets: Brass, No. 4:
 - a. Black Drapery: Provide brass or aluminum grommets with black finish.
 - b. Scrim Curtains: Place 12" on center and 1" from corner of curtain; for ties, snap hooks, or S-hooks.
 - c. Pleated Curtains: Centered on each box pleat and 1" from corner of curtain; for snap hooks or S-hooks.
8. Bottom Hems:
 - a. For flat draperies without fullness, provide a 4" lined hem with a pocket that allows the sliding of a pipe or conduit stiffener into the bottom of the curtain, and provide a concealing flap of same fabric in front of pocket and made 2" longer than the bottom edge of the pocket.
 - b. For draperies with fullness:
 - 1) For draperies that do not hang to the floor, provide hems not less than 3" deep with 3/4" weight tape. Sew open ends of hems closed.
 - 2) For floor-length draperies, provide hems not less than 6" deep with separate, interior, heavy canvas chain pockets equipped with proof coil chain or tape weights. Stitch chain pockets so chain rides 2" above finished bottom edge of curtain. Sew open ends of hems closed. The chain shall be tacked to the pocket every 3'-0" and secured at each end to prevent bunching.
9. Velour Draperies: Fabricate with the fabric nap down.

10. Lining:
 - a. Provide lining per the Lineset Schedule in TS Drawings.
 - b. Lining shall be in the same fullness as the face fabric and finished 2" shorter than face fabric.
 - c. Sew or otherwise securely attach lining to top hem of face fabric. Attach lining to face fabric along side seams with 4" twill tape.
 - d. Linings shall hang free at the bottom and shall be weighted with a No. 8, plated jack chain.
11. S-Hooks: Track Manufacturer's standard heavy-duty plated-wire hooks, not less than 2" long, shall be provided for each grommet of all the track-mounted drapery.
12. Tie Lines: No. 4 or No. 4-1/2 cord or braided soft cotton tape, black with one (1) tie line to identify center of drapery; not less than 5/8-inch-wide by 36-inches long, shall be threaded through grommets of all pipe-hung draperies. All tie lines shall be colored black except the tie line through the grommet located at the center of the drapery. The center tie line shall be colored white.
13. Scrim:
 - a. Fabricate from scrim curtain fabric, seamless, and sewn flat.
 - b. Provide 9'-0" x 0'-6" pipe pockets at bottom with a 6" gap between sections of pocket for ease of pipe installation, with a 6" flap of same fabric in front of pocket.
 - c. Provide double-stitched, 3" polyester webbing at top with not less than No. 2 brass grommets spaced at 12" on center and 1" from corner of scrim.
 - d. Provide not less than a 2" double-folded side hem and a 4" bottom hem.
 - e. Along sides, 4" wide by 18" long sections of jute webbing shall be sewn into turnbacks centered on the location of grommets inserted at 24" on center along each side.
 - f. Pocket shall contain an interior lining of canvas.
 - g. Provide a 3/4" pipe batten, threaded and coupled every 10'-0", for pipe pocket.
14. Cyclorama:
 - a. Fabricate from muslin fabric, seamless and sewn flat and selvage to the rear.
 - b. Provide 9'-0" x 6" pipe pockets at bottom with a 6" gap between sections of pocket for ease of pipe installation, with a 6" flap of same fabric in front of pocket.
 - c. Provide double-stitched, 3" polyester webbing at top with not less than No. 2 brass grommets spaced at 12" on center and 1" from corner of cyclorama.
 - d. Provide not less than a 2" double-folded side hem and a 4" bottom hem.
 - e. Along sides, 4" wide by 18" long sections of jute webbing shall be sewn into turnbacks centered on the location of grommets inserted at 24" on center along each side.
 - f. Pocket shall contain an interior lining of canvas.
 - g. Provide a 3/4" pipe batten, threaded and coupled every 10'-0" for pipe pocket.

2.05 STEEL-CURTAIN TRACK

A. Products:

1. Subject to compliance with requirements, provide one of the following:
 - a. Automatic Devices Company; Silent Steel 280 series.
 - b. H & H Specialties Inc.; 400 series.

B. Stage Traveler Track:

1. The grand drape, midstage traveler, and upstage traveler tracks shall be manually operated, bi-parting and suspended from dead-hung pipe battens.
2. Bi-parting traveler tracks shall have a 2'-0" minimum overlap at the center of the proscenium opening.
3. Attach track to the pipe batten along its length with pipe clamps per the manufacturer's requirements.
4. Provide centered pipe support and track lap clamp at the track overlap at stage center to allow accurate alignment of the pipe batten with the tracks.
5. The traveler tracks shall be complete with all necessary accessories and hardware. Provide quantity of curtain carriers sufficient for track length, to suit drapery fabrication.
6. End pulleys and floor block: One (1) dead-end, single-wheel pulley; one (1) live-end, double-wheel pulley; and one (1) adjustable, floor block; each with not less than 5" molded-nylon- or glass-filled-nylon-tired ball-bearing sheaves enclosed in steel housings. Provide pulleys with steel housing finished to match track and with bracket for securing off-stage drapery end.
7. The traveler tracks shall be complete with all necessary accessories and hardware, including carriers, pulleys, hand lines, rubber bumpers, pipe or hanging clamps, and adjustable floor blocks.
8. Operating hand lines shall be located on stage-right. Provide a heavy-duty detachable floor block that secures to a plate fastened to the stage-left floor to maintain proper tension on operating lines. Steel housing shall be painted black.
9. Provide with cord operating line consisting of manufacturer's standard 3/8" diameter, stretch-resistant operating cord consisting of braided synthetic-fiber jacket over solid, synthetic-fiber, linear filaments.
10. End stops shall be provided at each track end and each carrier shall be equipped with a free-moving swivel and sufficient trim chain to accommodate a drapery clip-hook.
11. ADC Model 280 exemplifies the requirements described herein.

C. Stage Leg Track:

1. The leg set drapes shall be of walk-along type operation.
2. Each leg set shall have track sections as indicated on the Lineset Schedule in TS Drawings.
3. The leg tracks shall be complete with all necessary accessories and hardware, including end stops.
4. Provide quantity of drapery carriers sufficient for track length, to suit drapery fabrication.
5. Provide black rope with a 4" ring on leading and trailing edge carriers to allow placement of the draperies along the track without having to touch curtain material.
6. ADC Model 284-N exemplifies the requirements described herein.

D. Scrim and Cyclorama Tracks:

1. The scrim and cyclorama shall be of walk-along type operation.
2. The scrim and cyclorama shall have one (1) track section as indicated on the Lineset Schedule in TS Drawings.
3. The scrim and cyclorama tracks shall be complete with all necessary accessories and hardware, including end stops.
4. Provide quantity of drapery carriers sufficient for track length, to suit drapery fabrication.
5. Provide black rope with a 4" ring on leading and trailing edges (or outer carriers) to allow placement of the scrim and cyclorama along the track without having to touch scrim and cyclorama material.

- 6. ADC Model 284-N exemplifies the requirements described herein.
- E. Each section of track less than 20'-0" shall be in one (1) continuous piece. Splice clamps shall be permitted for section lengths over 20'-0".
- F. Clamp and Bracket Hangers: Provide manufacturer's steel clamps and brackets of sufficient strength required to support loads for attaching track to pipe battens, and at intervals recommended by the manufacturer.

2.06 TORMENTOR POSITIONS

- A. General: Tormentors shall be SSRC 6x7TP or approved equal.
- B. Provide two (2) 7-foot tormentors located in the Auditorium adjacent to Performance Lighting outlet boxes at house right and house left. The center of the vertical member shall be 6-inches from the wall. Coordinate location and mounting per TS and Electrical Drawings and confirm with Electrical Contractor.
- C. Tormentors shall be 1-1/2-inch I.D. schedule 40 black pipe and be fabricated using welding construction.

2.07 THEATRICAL AND HOUSE LIGHTING DIMMING SYSTEMS

- A. General:
 - 1. Principal items of equipment are identified herein by manufacturer and part number. Alternate manufacturers and part numbers are given in instances where equivalence has been determined.
 - 2. Alternate manufacturers shall provide a system equivalent to that described herein, and which meet the same performance capabilities as the equipment listed in this Section.
 - 3. For items identified by manufacturer and part number, performance specifications which are published in the most recent manufacturer's data sheets available at the time of bidding shall be applicable to the present Work as though fully written out herein.
 - 4. For items not identified by manufacturer and part number, the Contractor may select items which conform to the functional and/or technical specifications. For all such items, the Contractor shall submit for approval all technical data which is available from the manufacturer.
 - 5. Acceptability for use in the performance relay system shall be determined by the Theatre Consultant. Such items shall be installed only after receipt of written approval by the Theatre Consultant.
 - 6. Provide blue running lights and driver as shown on TS Drawings.
- B. Architectural Lighting Control System:
 - 1. The architectural lighting control system shall be reconfigurable through software, requiring no hardware changes, and fully digital in operation.
 - 2. The system shall be capable of controlling individual relays via patchable zones.
 - 3. The system shall support LCD, slider, and pushbutton stations.
 - 4. The system shall provide "snapshot" recording of lighting control console output data to a "preset on" stations.

5. The system shall have the capability for uploading and downloading system software configurations.
 6. The architectural lighting control system shall interface with a fire alarm system contact closure signal to trigger house lighting to "ON" in an emergency.
 7. The Contractor shall provide at least ten (10) presets of programming for the House Light Master stations.
- C. Dimming and Distribution Equipment shall include the following major components:
1. House Light Master Station.
 2. House/Work Light Entry Stations.
 3. Console and Network Node Receptacle Stations and Accessories.
 4. DMX Networking Equipment.
 5. Performance Lighting Relay Panelboard.
 6. Distribution Equipment.
- D. Dimming and Distribution Equipment: The manufacturers and their products listed below exemplify systems with equipment and components meeting the basic requirements and intent of this specification:
- E. Equipment List:

DESCRIPTION	MANUFACTURER	MODEL	QTY
Relay Panel – RP RK1	ETC	IQ48	1
w/ Surface-mount Door	ETC	IQ Door 120-48S	1
w/ 200A Main Breaker	ETC	IQ-MB200A65K	1
w/ Contact Input	ETC	IQ-CI	1
w/ Ride-Thru Option	ETC	IQ-RTO	2
w/ Intelligent Breaker with Switching	ETC	IQ SM B20	40
w/ Standard Breaker	ETC	IQ B20	8
w/ Response Analog I/O Gateway	ETC	RSN-IO-RM	1
Relay Panel Feedthrough – FTP RK2	ETC	ERP24-FT	1
w/ Voltage Barrier Kit	ETC	ERP-FT-VB	1
w/ 0–10V Dimming Control Option	ETC	ERP-FT-LVD	1
w/ RideThru Option	ETC	ERP-FT-RTO	1
Lighting Interface Rack – PL RK-1	Middle Atlantic	DWR-35-17	1
w/ Rack-Mount Enclosure	ETC	Ern2-RM-120	1
w/ Architectural Control Processor	ETC	P-ACP	1
w/ Control Station Power Module	ETC	P-SPM	1
w/ 28-port POE Network Switch	Cisco	SG350-28P	1
w/ 24-port Patch Panel	Belden	As Required	1
w/ Cable Management Panel	Middle Atlantic	BR1	2
w/ Patch Cord, 2 feet	Belden	C501100002	A/R
w/ Network to DMX 4-port	ETC	RSN-DMX4-I	2
w/ Network to DMX 8-port	ETC	RSN-DMX8-O	3
w/ ID Panel, 1RU	Middle Atlantic	EB1, Custom Per Dwg.	1
w/ Blank Panel	Middle Atlantic	EB1	A/R
w/ Uninterruptible Power Supply	Middle Atlantic	UPS-1000R	1

DESCRIPTION	MANUFACTURER	MODEL	QTY
Lighting Control Console	ETC	Ion Xe 20 - 12K	1
w/ Dust Cover	ETC		1
w/ Fader Wing	ETC	Eos FW 20	1
w/ 19" (min.) LCD Touchscreen Monitor	ETC	Windows 7 Com- patible	2
w/ Console Light	Littlite		2
w/ Network Control Cable, 25 feet	ETC	CD-25NET	2
w/ DMX Control Cable, 25 feet	ETC	CD-25DMX	2
Wall Plug-In Station (RJ45x2, DMXinx2) – C1	ETC	ECPB- Netx2/DMXinx2	3
House Light Master Station – TS	ETC	P-TS7	1
w/ Flush Back Box	ETC	P-LCD-FBB	1
w/ Locking Cover	ETC	P-LCD-LC-__	1
Wireless Access Point	Netgear	WAX610	1
House Light Preset Station - 2 Button	ETC	PI1002-__	11
House Light Preset Station - 8 Button	ETC	PI1008-__	2
Floor Box (1 Circuit, 2 Twist Lock Connectors/1 DMXout) – FB-1 to FB-6	ETC	8500 Series per drawings	6
Tormentor Outlet Box, (2 Circuit, 2 Twist Lock Connectors/1 DMXout) T-1 and T-2	ETC	9800 Series per drawings	2
w/ 7'-0" tormentor pipe	SSRC	6"x7' TP	2
Catwalk Distribution Strips, 12'L (2 Circuit, 8 Twist Lock Pigtail Connectors/1 DMXout) – FH-1 to FH-4	ETC	9912- (8CP/2)(1D/1)-L- 34	4
Stage Electric Distribution Strip, 51'L (5 Circuits, 25 Twist Lock Pigtail Connectors/1 Circuit, 5 Flush Mount Twist Lock Connectors, 1 DMXout) - SE-1 to SE-4	ETC	9951-(25CP/5) (5CO/1)(1D/1)-R- 21	4
w/ Ceiling Mounted Junction Box – C-1 to C-4	ETC	Custom	4
6 Channel Blue Light Driver, Wall Mount – DV1	ETC	BSPS6WD	1
Blue Running Lights	ETC	BlueSystems Per Schedule	Per Dwg
Emergency Lighting DMX Bypass Unit	ETC	DEBC-6	1
Emergency Lighting DMX Bypass Detection Kit	ETC	EBDK	1

- F. Alternate Equipment Manufacturers: The following manufacturers of distribution equipment are approved alternates:
1. SSRC.
 2. Rigging Innovators.
 3. Approved equal.

2.08 LIGHTING INSTRUMENTS

- A. Provide, install, and program performance lighting instruments. Instruments shall be complete with C-clamp, male twist lock to Powercon or True1 connectors for traditional and work light fixtures, color frames (if appropriate), 5'-0" DMX control cables, and safety cables.
- B. Fixtures and associated accessories will be coordinated with the Owner's Representative and reviewed by the Theatre Consultant.
- C. Contractor shall submit cost data and other descriptive data to establish the basis used by the Contractor for determining attributable costs in Contract Allowance.
- D. Any Allowance amount not fully consumed shall be adjusted by a credit change order.
- E. Equipment List:

DESCRIPTION	MANUFACTURER	MODEL	QTY
LED Ellipsoidal – Light Engine with Shutter Barrel	ETC	CSSPOTVMVS	36
w/ Pipe Clamp	ETC	400CC	36
w/ Safety Cable	ETC	400SC	36
w/ Power Input Cable	ETC	T1PA-C	36
w/ Color Frame	ETC	400CF	36
w/ 19° Lens Tube	ETC	419EDLT	6
w/ 26° Lens Tube	ETC	426EDLT	20
w/ 36° Lens Tube	ETC	436EDLT	10
LED Zoom Ellipsoidal – Light Engine Body	ETC	CSSPOTVMV	6
w/ Pipe Clamp	ETC	400CC	6
w/ Safety Cable	ETC	400SC	6
w/ Power Input Cable	ETC	T1PA-C	6
w/ Color Frame	ETC	400CF	6
w/ 15°-30° Zoom Lens Tube	ETC	41530LT	6
LED PAR	ETC	CSPAR	48
w/ Pipe Clamp	ETC	400CC	48
w/ Safety Cable	ETC	400SC	48
w/ Power Input Cable	ETC	DPA-C	48
w/ Round Field Medium Lens Set Frame	ETC	SELRM-7.5	48
w/ Color Frame	ETC	407CF	48
LED Cyc Light	ETC	CSCYC	16
w/ Pipe Clamp	ETC	400CC	16

DESCRIPTION	MANUFACTURER	MODEL	QTY
w/ Safety Cable	ETC	400SC	16
w/ Power Input Cable	ETC	DPA-C	16
LED Work Light Fixture	The Light Source	WL-100-B-78-30K-P-X-M	20
w/ Pipe Clamp	The Light Source	MAB	20
w/ Safety Cable	The Light Source	SC	20
LED Follow Spot	Lycian	ZOT jr. 240W LED	2
w/ Tripod Stand	Lycian		2
w/ powerCON to Edison Cable	Lycian		2
18" Side Arm	The Light Source	MSAB18	20
5' Twistlock Jumper Cable	Lex	BE7000-5	15
10' Twistlock Jumper Cable	Lex	BE7000-10	15
25' Twistlock Jumper Cable	Lex	BE7000-25	4
5' DMX Control Cable	ETC	CD5-DMX	110
10' DMX Control Cable	ETC	CD10-DMX	30
25' DMX Control Cable	ETC	CD25-DMX	4
5' powerCON Jumper Cable	ETC	DPJ-5	15
10' powerCON Jumper Cable	ETC	DPJ-10	15
5' TRUE1 Thru Jumper Cable	ETC	T1PJ-5	15
10' TRUE1 Thru Jumper Cable	ETC	T1PJ-10	15
5' powerCON plug to TRUE1 receptacle adapter cable	ETC	DPT1A-5	15
5' TRUE1 plug to powerCON receptacle	ETC	T1DPA-5	15

PART 3 - EXECUTION

3.01 COORDINATION

- A. The Contractor shall coordinate this Work with the other electrical work and the work of other trades.

3.02 SITE INSPECTION

- A. All site conditions shall be verified before beginning Work. All work required to properly install and secure items in place shall be provided. Any cutting or drilling of structural work shall be done only with prior approval.

- B. Examine areas and conditions, with Installer present, for compliance with requirements for supporting members, blocking, installation tolerances, clearances, and other conditions affecting performance of stage-drapery work. Examine inserts, clips, blocking, or other supports required to be installed by others to support tracks and battens.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.03 WORKMANSHIP

- A. The Contractor shall provide a trained foreman who shall supervise the installation of all theatre equipment. All work shall be done by mechanics skilled in their trade and in accordance with accepted shop drawings.

3.04 INSTALLATION

- A. Installation of all equipment shall be true to plumb, line, or level. All material, hardware, supports, and other items required for a complete and correct installation shall be supplied.
- B. The Contractor shall do all cutting and patching necessary for proper installation of the system and shall repair any damage done by himself or his workmen. Any required penetration of slabs of CMU walls shall be made by a cutting method rather than by a concussive method.
- C. Any required penetration of slabs or CMU walls shall be made by a cutting method rather than by a concussive method.
- D. Install Work neatly, with boxes, equipment, etc. plumb and square. Keep the job adequately always staffed. Designate a field supervisor to be present on the job site and in responsible charge during all phases of installation and check out. Maintain same supervisor throughout the execution of the work unless circumstances beyond the control of the Contractor intervene. Install the system in cooperation with other trades to achieve coordinated progress and satisfactory results. Watch for conflicts with work of other trades on the job. Execute without claim for extra payment, moderate moves, or changes as are necessary to accommodate other equipment or preserve symmetry and pleasing appearance.
- E. Locate all apparatus requiring adjustments, cleaning, or similar attention so that it will be accessible.
- F. All supporting structures and enclosures supplied by the Contractor, not having a standard factory paint finish, shall be painted. Paint specifications and color shall be supplied by the Architect.
- G. Clearly, logically, and permanently mark switches, connectors, jacks, relays, receptacles, cables, and cable terminations.
- H. Etch, engrave, silk screen, or apply in a similar permanent manner all legends and markings on all custom panels and receptacle plates. Embossed tape, presstype, etc., are not acceptable.

- I. The equipment specified herein must be capable of operation in environments of normal humidity, dust, and temperature. The Contractor should avoid installing equipment where extreme environmental conditions can occur and shall be responsible for protection of equipment and related wiring from such conditions.
- J. The Contractor shall take precautions to prevent electromagnetic and electrostatic hum. Install the equipment to provide safe operation. Provide ventilation as required to maintain equipment within the manufacturer's specified temperature limits.
- K. Provide all cables necessary for interconnection of permanently mounted equipment. Use terminations required to achieve full function of equipment as specified herein.

3.05 SYSTEM START UP, OWNER'S INSTRUCTION, AND COMMISSIONING

- A. A theatrical lighting system factory representative shall provide initial inspection, troubleshooting, and checkout of the theatrical lighting system prior to its being energized.
- B. When all Work is complete and equipment is adjusted for suitable operation, the Contractor shall schedule an inspection by the Theatre Consultant. All workmen required to operate the equipment and to perform any adjustments and tests that may be required shall be provided. During the scheduled test period, no other work will be done in the Stage and/or Auditorium areas. Any equipment failing to meet approval shall be repaired or replaced and the inspection rescheduled with complete testing repeated until approval and final acceptance.

3.06 INSTRUCTION AND TRAINING

- A. A minimum of three (3) hours of instruction in equipment operations, safety procedures, and maintenance shall be furnished for the dead-hung theatre rigging system.
- B. A minimum of four (4) hours of instruction in equipment operation and maintenance shall be furnished for the motorized rigging systems.
- C. A minimum of six (6) hours of instruction in equipment operation and maintenance shall be furnished for the performance lighting relay system. Training shall be divided into two (2), three-hour sessions.
- D. Training and instruction shall be provided in the presence of the Theatre Consultant; however, this condition may be waived at the Theatre Consultant's discretion.
- E. Training will be recorded by the Contractor. Contractor shall provide two (2) copies of the training video on a DVD and a duplicated copy on a USB drive to the Owner. Contractor will supply the equipment necessary to record the training session(s).

- F. During the training, the participants shall be given opportunities for "hands-on" experience with operating the controls. There shall be demonstrations using the systems themselves as aids. Personnel for instruction and training for the Theatre Systems shall be designated by the Owner.

END OF SECTION

SECTION 116623 - GYMNASIUM EQUIPMENT

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Basketball backboards, goals, and support framing.
- B. Floor sleeves for net and goal posts.
- C. Wall mounted protection pads.
- D. Gym divider curtains.
- E. Volleyball nets and posts.
- F. Wrestling Mats & Hoist
- G. Ceiling Suspended Double Pull Batting Cage

1.02 RELATED REQUIREMENTS

- A. Section 033000 - Cast-in-Place Concrete: Concrete floor slab to receive floor sleeves and anchors.
- B. Section 051200 - Structural Steel Framing: Structural members supporting basketball systems.
- C. Section 055000 - Metal Fabrications: Secondary structural members supporting gymnasium equipment.
- D. Section 096466 - Wood Athletic Flooring: Gymnasium flooring.

1.03 REFERENCE STANDARDS

- A. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2025, with Errata (2026).
- B. NFPA 286 - Standard Methods of Fire Tests for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth; 2024.
- C. NFPA 701 - Standard Methods of Fire Tests for Flame Propagation of Textiles and Films; 2023, with Errata.

1.04 SUBMITTALS

- A. See Section 013000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide manufacturer's data showing configuration, sizes, materials, finishes, hardware, and accessories; include:
 - 1. Fire rating certifications.
 - 2. Manufacturer's installation instructions.
- C. Shop Drawings: For custom fabricated equipment indicate, in large scale detail, construction methods; method of attachment or installation; type and 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. Operating and maintenance data for each operating equipment item.
- E. 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.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products to project site in manufacturer's original packaging with factory original labels attached.
- B. Store products indoors and elevated above floor; prevent warping, twisting, or sagging.
- C. Store products in accordance with manufacturer's instructions; protect from extremes of weather, temperature, moisture, and other damage.

1.07 WARRANTY

- A. See Section 017800 - Closeout Submittals, for additional warranty requirements.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Gymnasium Equipment:
 - 1. Draper, Inc: www.draperinc.com/#sle.
 - 2. Performance Sports Systems
 - 3. Porter

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:
- 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. Structural Steel Fabrications: Welded in accordance with AWS D1.1/D1.1M, using certified welders.

2.03 BASKETBALL EQUIPMENT

- A. General: Provide equipment complying with requirements in National High School Rules and regulations.
 - 1. Basis of Design: Draper: EZ Fold TF-20
- B. Protruding fasteners or exposed bolt heads on front face of backboards are not permitted.
- C. Overhead-Supported Backboard:
 - 1. Folding Type: Provide manufacturer's standard assembly for forward-folding, front-braced backboard, with hardware and fittings to permit folding.
 - 2. Framing: Steel pipe, tubing, and shapes. Design framing to minimize vibration during play.
 - a. Center-Mast Frame: Welded and bolted or clamped with side sway bracing.
 - b. Finish: Manufacturer's standard powder-coat finish.
 - 3. Goal Height Adjuster: Adjustable from 8 to 10 feet (2.4 to 3 m) with gear-drive mechanism, locking in any position within adjustment range, with visible height scale attached to side of framing.
 - a. Operation: Manual with detachable crank handle.
- D. Backboard Safety Device: Designed to limit free fall if support cable, support chain, pulleys, fittings, winch, or related components fail; with mechanical automatic reset; 6000-lb (2722-kg) load capacity; one per folding backboard.
 - 1. Retractor Device: Manufacturer's standard device designed to retract both support and safety cables, chains, and straps away from play of the basketball when backboard is in playing position; one per folding backboard.
- E. Backboard Electric Operator: Provide operating machine of size and capacity recommended by manufacturer for equipment specified, with electric motor and factory-prewired motor controls, starter, gear-reduction unit, and remote controls. Coordinate wiring requirements and electrical characteristics with building electrical system.
 - 1. Operator Type: Cable drum with grooved drum and cable tension device to automatically take up cable slack and retain cable in grooves.
 - 2. Operator Mounting: Roof structure.
 - 3. Motor Characteristics: Sufficient to start, accelerate, reverse, and operate connected loads at designated speeds within installed environment and with indicated operating sequence, and without exceeding nameplate rating or considering service factor. Comply with NEMA MG 1, and the following:
 - 4. Voltage: 208-220 V.
 - 5. Horsepower: $\frac{3}{4}$ hp.

6. Enclosure: Manufacturer's standard.
7. Duty: Continuous duty at ambient temperature of 105 deg F (40 deg C) and at altitude of 3300 feet (1005 m) above sea level.
8. Service Factor: 1.15 for open dripproof motors; 1.0 for totally enclosed motors.
9. Phase: One.
10. Remote-Control Station(s): NEMA ICS 6, Type 1 enclosure for recessed or flush mounting, momentary-contact, three-position switch-operated control with up, down, and off functions.

- a. Group Key Switch Control Stations: One switch per each backboard.
- b. Keys: Provide two keys per station.
- c. Switches, Ganged

- 1) Limit Switches: Adjustable switches, interlocked with motor controls and set to automatically stop basketball equipment at fully retracted and fully lowered positions.

F. Basketball Backboard for ceiling mounted backboards:

1. Shape and Size:
 - a. Rectangular, 72 by 42 inches (1800 by 1050 mm) for side courts and 72 by 48 inches (1800 by 1200 mm) for main court. width by height.
2. Backboard Material: With predrilled holes or preset inserts for mounting goals, and as follows:
 - a. Glass: Not less than 1/2-inch- (13-mm-) thick, transparent tempered glass. Provide glass with impact-absorbing resilient rubber or PVC gasket around perimeter in a fully welded, natural-finish, extruded-aluminum frame, with steel subframe, reinforcement, and bracing and with mounting slots for mounting backboard frame to backboard support framing.
 - 1) Standard Mount: Provide steel corner reinforcement with mounting slots for mounting backboard frame to backboard support framing at standard mounting centers.
 - 2) Rim-Restraining Device: Complying with NCAA and NFHS rules and designed to ensure that basket remains attached if glass backboard breaks.
3. Target Area and Border Markings: Permanently etched in white color, marked in manufacturer's standard pattern and stripe width.

G. Goal Mounting Assembly: Compatible with goal, backboard, and support framing; with hole pattern that is manufacturer's standard for goal attachment.

1. Glass Backboard Goal Mounting Assembly: Goal support framing and reinforcement designed to transmit load from goal to backboard frame and to minimize stresses on glass backboard.
- H. Basketball Goals: Complete with flanges, braces, attachment plate, and evenly spaced loops welded around underside of ring.
1. Single-Rim Basket Ring Competition Goal: Materials, dimensions, and fabrication complying with referenced rules.
 2. Type: Movable, breakaway design with manufacturer's standard breakaway mechanism and rebound characteristics identical to those of fixed, nonmovable ring.
 3. Mount: Front.
 4. Net Attachment: [No-tie loops for attaching net to rim without tying.
 5. Finish: Manufacturer's standard finish.
- I. Basketball Nets: 12-loop-mesh net, between 15 and 18 inches (400 to 450 mm) long, sized to fit rim diameter, and as follows:
1. Cord: Made from white nylon.
- J. Backboard Safety Pads: Designed for backboard thickness indicated and extending continuously along bottom and up sides of backboard and over goal mounting and backboard supports as required by referenced rules.
1. Attachment: Manufacturer's standard.
 2. Color: As selected by Architect from manufacturer's full range.

2.04 VOLLEYBALL EQUIPMENT

- A. General: Provide equipment complying with requirements in National High School Rules and Regulations.
- B. Floor Insert: Solid-brass floor plate; and steel pipe sleeve, concealed by floor plate, with capped bottom end, sized with ID to fit post standards, not less than 12 inches (300 mm) long to securely anchor pipe sleeve below finished floor in concrete footing; with anchors designed for securing floor insert to floor substrate indicated; one per post standard as noted on the plans.
1. Floor Plate: Lockable hinged access cover, designed to be flush with adjacent flooring. Provide two tool(s) for unlocking access covers.
- C. Post Standards: Removable, paired volleyball post standards[and center post standard for multicourt play] as indicated. Fixed height. Designed for easy removal from permanently

placed floor insert supports. Fabricated from steel pipe or tubing, with nonmarking plastic or rubber end cap or floor bumper to protect permanent flooring. Finished with manufacturer's standard factory-applied, baked powder-coating finish complying with finish manufacturer's written instructions for surface preparation including pretreatment, application, baking, and minimum dry film thickness or plated metal finish.

1. Nominal Pipe or Tubing Diameter: 3-1/2-inch (89-mm) OD at base.
 2. Net Height Adjuster: Track or rail system and lock mechanism designed for infinite height adjustment, complete with fittings; designed for positioning net at heights indicated.
 - a. Net Heights: Between sitting volleyball net height and boys'/men's volleyball net height, 36 and 95-5/8 inches or more.
 3. Height Markers: Clearly marked at regulation play heights for girls/women, boys/men.
- D. Net: 32 feet long and as follows; 2 per every center post standard:
1. Width and Mesh: 36 inches with 4-1/2-inch square mesh made of black polyester string.
 - a. Hem Band Edges: White, 2-inch wide top binding; black, [3/4-inch- (19-mm-)] [1-inch- (25- mm-)] wide bottom and side bindings; tie offs at top and bottom of each side end of net; and 1/4-inch diameter rope, at least 42 feet long, threaded through top hem of binding.
 2. Dowels: Not less than 1/2-inch diameter fiberglass or 1-inch diameter wood. Provide two dowels per net threaded through each side hem sleeve for straightening net side edges.
 3. Net Antennas: 3/8-inch diameter, high-tensile-strength, extruded fiberglass or plastic rods, 72 inches long, extending above top hem band of net, with alternating white and red bands according to competition rules. Provide two antennas per net.
 - a. Clamps: Designed to secure antenna to top and bottom of net.
 4. Boundary Tape Markers: 2-inch wide white strip with sleeve for securing net antenna, secured to net top and bottom with hook-and-loop attachment. Provide two tape markers per net for marking court boundaries.
- E. Net Tensioning System: Designed to adjust and hold tension of net. Fully enclosed, nonslip manufacturer's standard-type winch with cable length and fittings for connecting to net lines, positive-release mechanism, and removable handle. Mount net tensioner on post standard at side away from court. Provide end post with post top pulley. Provide opposing post with welded steel loops, hooks, pins, or other devices for net attachment and post top grooved line guide.
- F. Bottom Net Lock Tightener: Provide manufacturer's standard quick-release-type tension strap, spring- loaded self-locking tensioner, turnbuckle, pulley, or other device and linkage fittings designed to quickly and easily tighten bottom line or net.

- G. Safety Pads: manufacturer's standard foam filler covered by puncture- and tear-resistant, manufacturer's standard fabric cover; with fire-test-response characteristics indicated. Provide pads with hook-and-loop closure or attachments for the following components:
 - 1. Post Standards: Wraparound style, designed to totally enclose each standard to a height of not less than 66 inches, 1 per post.
 - a. Net Lines: Four per net.
 - b. Fabric Cover Flame-Resistance Ratings: Passes NFPA 701.
 - c. Fabric Color: As selected by Architect from manufacturer's full range.
 - d. Graphics: Custom graphics as indicated.
- H. Wall Storage Rack: Manufacturer's standard unit designed for mounting on walls and for storing post standards in vertical position with retaining arms, fittings for padlock, and mounting hardware; number of units as required to provide storage for specified equipment.

2.05 SAFETY PADS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Draper, Inc – Ecovision Wall Pad
 - 2. Colors White & Grey
 - 3. 2'x6' Wall Pad with 1" Nailing Margins
- B. Safety Pad Surface-Burning Characteristics: ASTM E 84 by UL or another testing and inspecting agency acceptable to authorities having jurisdiction:
 - 1. Flame-Spread Index: 25 or less.
 - 2. Smoke-Developed Index: 450 or less.
- C. Pad Coverings: Provide safety pad fabric covering fabricated from puncture- and tear-resistant, not less than 14-oz./sq. yd PVC-coated polyester or nylon-reinforced PVC fabric treated with fungicide for mildew resistance; with surface-burning characteristics indicated.
- D. Wall Safety Pads: Padded wall wainscot panels designed to be attached in a continuous row; each panel section consisting of fill laminated to backer board with visible surfaces fully covered by seamless fabric covering, free of sag and wrinkles and firmly attached to back of backer board.
 - 1. Backer Board: Not less than 3/8-inch thick fire-retardant-treated plywood per AWPA C27, Interior Type A.

2. Fire-Resistive Fill: Multiple-impact-resistant foam not less than 2-inch thick fire-resistive neoprene, 6.0-lb/cu. ft. density.
3. Size: Each panel section, 24 inches wide by not less than 72 inches long.
4. Number of Panel Sections: As indicated modular panel sections.
5. Installation Method: Concealed mounting Z-clips.
6. Fabric Covering Color(s): As selected by Architect from manufacturer's full range color(s).

2.06 FOLD-UP DIVIDER SYSTEMS

- A. Divider Curtain System: Electrically operated, upward folding, cable suspended, and as follows:
 1. Top Hem: Double-thickness mesh or solid vinyl for continuous pipe batten.
 2. Outer Edge Hems: Triple turned and welded.
 3. Bottom Curtain Pocket: 6 inches (152 mm) with manufacturer's standard pipe batten with padding.
 4. Grommets: Manufacturer's standard material, size, and spacing; for lift cables to pass through curtain material.
 5. Support Cables: 1/8-inch-(3.2-mm-) diameter galvanized-stranded-steel wire rope with a breaking strength of 2000 lb (907 kg). Provide fittings complying with cable manufacturer's written instructions for size, type, number, and installation method.
 6. Support Chain and Fittings: Hardened alloy steel chain rated for lifting loads indicated, with commercial-quality, corrosion-resistant steel connectors and hangers.
 7. Curtain Battens and Drive Pipe: Fabricate from steel pipe or tubing with a minimum number of joints, as necessary for required lengths. Provide galvanized battens and drive pipe or shop prime and shop finish with black paint.
 - a. Drive Pipe: 2-3/8-inch-(60-mm-) nominal diameter steel pipe.
 - b. Top and Bottom Battens: 1-1/2-inch-(38-mm-) nominal diameter steel pipe.
- B. MATERIALS
 1. Support Chain and Fittings: For chains used for overhead lifting, provide Grade 80 heat-treated alloy steel chains, complying with ASTM A 391/A 391M, with commercial-quality, zinc-plated steel connectors and hangers.
 2. General-Purpose Chain: For chains not used for overhead lifting, provide carbon steel chain, complying with ASTM A 413/A 413M, Grade 30 proof coil chain or other grade recommended by gymnasium divider manufacturer. Provide coating type, chain size, number, and installation method complying with manufacturer's written instructions.
 3. Anchors, Fasteners, Fittings, and Hardware: Manufacturer's standard corrosion-resistant or noncorrodible units; concealed.
- C. ELECTRIC OPERATORS
 1. General: Factory-assembled electric operation system of size and capacity recommended and provided by gymnasium divider manufacturer for gymnasium dividers specified, with electric motors, thermal-overload protection, factory-prewired motor controls, control devices, and accessories required for proper operation. Include wiring from control stations

to motors. Coordinate operator wiring requirements and electrical characteristics with building electrical system.

2. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
3. Limit Switches: Adjustable switches, interlocked with motor controls and set to automatically stop dividers at fully extended and fully retracted positions.
4. Control System:
 - a. Key Operation: NEMA ICS 6, Type 1 enclosure, momentary-contact, three-position switch- operated control.
 - 1) Keys: Provide two key(s) per station.

D. DIVIDER CURTAINS

1. Upper Curtain, Mesh: Woven mesh of polyester yarn coated with vinyl, weighing not less than 9 oz./sq. yd. (305 g/sq. m).
 - a. Mesh Color: As selected by Architect from full range of industry colors and color densities.
2. Lower Curtain, Solid: Woven polyester fabric coated with vinyl, 22 oz./sq. yd. (745 g/sq. m), 10-foot (3.0- m) height above floor.
 - a. Fabric Color(s): One color(s), as selected by Architect from full range of industry colors and color densities.
3. Hems: Folded and electronically welded.
4. Seams: Electronically welded.
5. Overall Curtain Height: As indicated.
6. Bottom of Curtain: Approximately 2 inches (50 mm) above finished floor.

2.07 ELECTRONIC SCOREBOARDS

- A. Basis of Design: Daktronics Model BB-2103 – 2 Total – One in Aux Gym and Main Gym.
 1. Size: 6'-0"H x 8'-0" W x 0'-6" D
 2. Digit Size: 10" height.
 3. Power: 120v/200w/1.7A
 4. Controller: AS 3100 wireless-type tabletop unit

2.08 WRESTLING MATS

- A. Basis of Design: Dollamur: Flexi-roll With Mat Tape at Seams
 - 1. Mat Color: Purple
 - 2. Custom Logo at Competition Circle, practice circle, and logo.

2.09 Ceiling Suspended Double Pull Batting Cage

- A. Basis of Design: Jaypro Sport: BBC-702
 - 1. Motorized Ceiling Suspended Double Pull Batting Cage

2.10 Wrestling Mat Hoist

- A. Basis of Design: Draper: Model #502061 Double Mat Lifter
 - 1. Motorized Ceiling Suspended Double Mat Lifter

PART 3 EXECUTION

3.01 EXAMINATION

- A. Take field measurements to ensure proper fitting of work. If taking field measurements before fabrication will delay work, allow for adjustments within recommended tolerances.
- B. Inspect areas and conditions before installation, and notify Architect in writing of unsatisfactory or detrimental conditions.
- C. Do not proceed with this work until conditions have been corrected; commencing installation constitutes acceptance of work site conditions.

3.02 INSTALLATION

- A. Install in accordance with Contract Documents and manufacturer's instructions.
- B. 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.

3.04 PROTECTION

- A. Protect installed products until Date of Substantial Completion.
- B. Replace damaged products before Date of Substantial Completion.

END OF SECTION

SECTION 116643 – INDOOR LIVE VIDEO DISPLAY

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. LED matrix display

1.02 REFERENCES

- A. Standard for Electric Signs, UL-48, 14th Edition
- B. Standard for Control Centers for Changing Message Type Signs, UL-1433, 4th Edition
- C. Standard for CAN/CSA C22.2 No. 207-M89
- D. Federal Communications Commission Regulation Part 15
- E. National Electric Code

1.03 SUBMITTALS

- A. Product data: Submit manufacturer's product illustrations, data and literature that fully describe the displays and accessories proposed for installation.
- B. Shop drawings: Submit mechanical and electrical drawings.
- C. Maintenance data: Submit manufacturer's installation, operation, and maintenance manuals.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Product delivered on site
- B. Display and equipment to be housed in a clean, dry environment

1.05 PROJECT CONDITIONS

- A. Environmental Limitations: Do not install equipment until spaces are enclosed and weatherproof, wet work in spaces is complete and dry, and ambient temperature and humidity conditions are maintained at the levels indicated for project when occupied for its intended use.
- B. Field Measurements: Coordinate display location and height with the customer. Verify dimensions by field measurements.
- C. Supply weight and mounting method for owner to verify that building structure can support the display's weight in addition to the auxiliary equipment.

1.06 QUALITY ASSURANCE

- A. For indoor use only
- B. Source Limitations: Obtain each type of electronic display through one source from a single manufacturer.
- C. ETL listed to UL Standards 48 and 1433
- D. ETLC listed to CAN/CSA 22.2
- E. CE compliant
- F. FCC compliant
- G. EU EMC Directives 55022/55024/61000 compliant
- H. Installed per NEC

1.07 WARRANTY

- A. Provide 5 years of no cost parts exchange including ground shipping on electronics parts due to manufacturing defects. Depending on the circumstances and at our discretion, Daktronics will exchange or repair and return failed parts.
- B. Provide toll-free service coordination.
- C. Provide technical online and phone support during Daktronics business hours.

PART 2 PRODUCTS

2.01 MANUFACTURER

- A. Daktronics, Inc., 201 Daktronics Drive, P.O. Box 5128, Brookings, SD 57006-5128

2.02 COMMUNICATION TYPE

- A. Fiber Optic (50/125 µm multi-mode)

2.03 PRODUCT

- A. LPN-5511 displays show live and recorded video clips, real-time scores/stats, animations, graphics, and text messages. SMD (3-in-1) LED packages feature 3.7mm row and column spacing to provide wider viewing angles and extremely close viewing distances.

2.04 DISPLAY

- A. General information

[Cabinet Dimensions: 6.64' (2.03 m) high, 11.81' (3.6 m) wide, 6.51" (165 mm) deep

Matrix size: 540 x 960

Weight: 435 lb (195 kg)

Power requirements: 1949 W]

- B. Cabinet Paint Color

- 1. Black

- C. Construction

- 1. Die-Cast Magnesium and Aluminum
- 2. Service Access: Front

- D. Display Capabilities

- 1. Color Capacity: 16 bit (281 trillion colors)
- 2. LED Refresh Rate: 7680 Hz as defined by the number of times per second the LED image is repainted in intensity
- 3. Display has signal redundancy allowing for signal path both forward and backwards through panels allowing for loss of only 1 panel vs. rows or blocks of multiple panels in case of failure.

- E. Viewing Characteristics

- 1. Calibrated Intensity: 1200 nits
- 2. Brightness Control: 256 levels (manual, scheduled or automatic)
- 3. Suggested Viewing Angle: 160° horizontal and +80°/-80° vertical

- F. Pixel Characteristics

- 1. Each pixel consists of one RGB 3-in-1 surface-mount device LED.
- 2. Pixel spacing measurement must be measured from the center points of neighboring physical pixels, rather than neighboring physical and virtual pixels.

- G. LED Tile Characteristics

- 1. Tiles shall be for indoor use.
- 2. Tiles shall have anti-reflective paint or coating applied to display face. Black state across all tiles shall exhibit a Delta E color variation of no more than .4.
- 3. Tiles shall have horizontal louvers running between LEDs or pixels.
- 4. Tiles shall be able to be removed and installed from the front of the display.
- 5. It is not necessary to remove or insert screws in order to remove or install tiles.

- H. Video Processing

- 1. Video Frame Rate: 50/60 frames per second
- 2. Graphic Frame Rate: 30 frames per second
- 3. Processing Architecture: 22 bit (distributed)
- 4. System Architecture: 100% digital
- 5. Video Enhancement: Color space conversion, adjustable gamma correction, proprietary sharpening technology and enhancement algorithms for optimal picture quality

- I. LED Quality
 - 1. Quality Control: Sorted by intensity and color wavelength
 - 2. LED Lifetime: 100,000 hours of operation as defined by time at which display intensity has decreased to 50 percent of the original intensity
- J. Calibration
 - 1. Pixel-to-pixel and tile-to-tile optical color calibration must be performed at the factory. The manufacturer must also provide easy-to-use calibration software that allows individual tiles and pixels to be independently adjusted while in the display.
 - 2. If tiles should need replacement during the life of the display, the calibration software must match newer tiles' brightness levels to older tiles' levels to preserve picture quality and maintain a uniform display appearance.
- K. Display Interface
 - 1. The full-color video display must be able to interface and display real-time data from the control system without the need for a duplicate or redundant input.

2.05 VIDEO CONTROL SYSTEM

1 VIDEO INPUT CONTROL SYSTEM

- A. Equipment Rack
 - 1. Dimensions: 25.75" H x 19.25" W x 26" D (654 mm x 489 mm x 660 mm); 14RU
 - 2. A larger rack may be required based on additional optional equipment.
- B. Media Player
 - 1. Provide a Digital Media Player (DMP).
 - 2. Matrix Resolution: Up to 2160x3840
 - 3. Video Input: SDI or HDMI up to 1080p 59.94
 - 4. Video Output: DisplayPort to Daktronics Display Interface
 - 5. Audio Output: balanced 3-pin XLR
 - 6. Memory: 32 GB DDR5 SODIMM
 - 7. Storage: 1 TB
 - 8. Networking: 10/100/1000 Ethernet (RJ-45 LAN) @1
 - 9. Dimensions: Half-width 2RU; 3.4" H x 8.7" W x 12.5" D (86 mm x 221 mm x 318 mm)
- C. Display Interface
 - 1. Provide a Display Interface (DI).
 - 2. Video Input: HDMI from Daktronics DMP
 - 3. Video Output: Daktronics ProLink® 6 (fiber optic) @1
 - 4. Networking: 10/100/1000 Ethernet (RJ-45 LAN) @1
 - 5. Dimensions: Half-width 1RU; 1.75" H x 8.75" W x 12" D (44.5 mm x 222 mm x 305 mm)
- D. Uninterruptable Power Supply (UPS)
 - 1. Battery operation after a power outage ensures enough time for proper shutdown of control equipment.
- E. Network Router – 1 Gigabit

2.06 CONTROL COMPUTER

- A. Laptop
 - 1. Operating System: Windows® 11 Pro
 - 2. Processor: Intel® Core™ i5
 - 3. Memory: 16 GB RAM
 - 4. Hard Drive: 500 GB
 - 5. Form Factor: Dell Latitude 5510

6. Laptop may be removed from the control location so content can be created and modified elsewhere. When the laptop is reconnected to the rack, updated content is synced in a matter of minutes.

2.07 CONTROL SOFTWARE

- A. Manufacturer must provide a Windows® 11 based computer with the control software loaded, configured, and ready to control display at startup.
- B. Must be developed by the manufacturer of the Display, Media Player, and Display Interface.
- C. The display's control software must provide simple, user-friendly features for creating, editing, scheduling, running and deleting messages.
- D. Display Software features:
 1. Direct control of an infinite number of displays located on a network
 2. Simultaneous display and edit capability
 3. Content playlists with loop, shuffle, random and next play functionality
 4. Thumbnail preview of content clips
 5. Onscreen display monitor
 6. Unlimited, color-coded buttons with adjustable sizes
 7. Multiple operator workspaces
 8. Support input devices such as a mouse, keyboard, touch screen, and dual monitor
 9. Icon and pull-down menu programming features
 10. Help screens
- E. Content Editor Software features:
 1. Display of TrueType fonts and other Windows® compatible character fonts
 2. Inline text editing
 3. Outlined, Drop shadowed, Bold, Italic, and Underlined text modes
 4. Ability to copy and paste text from most Windows applications
 5. Import common image and animation formats, including BMP, JPEG and AVI
 6. Content preview
 7. Content layering
 8. Real-time data (RTD) integration allows operators to create messages with information that automatically updates without user intervention. Such data may include scores, game time, player/team statistics, time-of-day, date or temperature.
 9. Profanity protection and Spell Check
 10. Multiple transition effects for entry, hold and exit

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that mounting surface is ready to receive the display. Verify that placement of conduit and junction boxes are as specified and indicated in plans and shop drawings.

3.02 INSTALLATION

- A. Power conduit, cables and outlet boxes to be provided and installed by the electrical contractor. Signal raceways, conduit and boxes to be provided by the electrical contractor. Electrical contractor is responsible for pulling signal wire and terminators between each display and control location. Display vendor to terminate signal wire of controller and conduit to display.
- B. Mount interior displays to wall in location detailed and in accordance with manufacturer's instructions. Unit to be plumb and level.

3.03 INSTALLATION—CONTROL CENTER

- A. Provide boxes, cover plates and jacks as required to meet control specification requirements. Control cables to control panels must be concealed.

- B. Test the operation of the display, controller and all control jacks; leave control unit and other loose items with owner's designated representative.
- C. Conduct operator training on the display/controller operation.
- D. Manufacturer must supply all required signal conversion hardware to allow for direct wire control of electronic display.

END OF SECTION

SECTION 116800 - PLAYFIELD EQUIPMENT AND STRUCTURES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
- B. Related Sections:
 - 1. Division 32 – “Concrete for Mow Bands and Headers”
 - 2. Division 32 – “Concrete Paving”
 - 3. Division 32 – “Chain Link Fence & Gates” – Chain link fence

1.02 SUMMARY

- A. This Section includes the following:
 - 1. Discus Throw Form
 - 2. Discus Cage with Extension Arms
 - 3. Discus Net Extension

1.03 SUBMITTALS

- A. Product Data / Technical literature / Samples from Manufacturer / Supplier for each type of product indicated above.

1.04 SUBSTITUTIONS

- A. Products specified herein shall be the basis of design. Substitutions for specific materials will be accepted except under the following conditions. Alternative proposals must be fully supported by necessary documentation showing compatibility/comparability with specific materials. Substitution requests must also comply with the General Conditions.

1.05 QUALITY ASSURANCE

- A. Workmanship, fabrication and shop connections shall be in accordance with AWS and AISC specifications.
- B. Welding shall be done by welder(s) certified for AWS, D.1 structural welding requirements.

1.06 PRODUCT DELIVERY AND HANDLING

- A. Coordinate delivery requirements with Manufacturer.

- B. Products shall be delivered to the project site in good condition and shall be contained in the Manufacturer's crate/packaging. The Contractor shall not accept delivery of damaged items. Products shall free from defects and damage. Damaged products shall be replaced by the manufacturer at no additional cost.
- C. Comply with Manufacturer's requirements for unloading, lifting, and placement.

1.07 WARRANTY

- A. Guarantee material used in this section against defects due to any cause for a period of one (1) full year from the date of Substantial Completion of work.

PART 2 - PRODUCTS

1.08 RECREATION EQUIPMENT

- A. Discus Thrown Form:
 - 1. Manufacturer: SportsField Specialties, Inc.
Contact: Scott Vantyle, Regional Manager
Ph: 607.437.3502
e-mail: scott.vantyle@sportsfield.com
 - 2. Model: TRDAW
Description: Discus Web Reinforced Throw Ring
 - 3. Quantity: Three (3)
 - 4. See installation instructions on Sheet L300, Detail 06
 - 5. Acceptable Alternates / Substitutions: See 1.04 above.
- E. Discus Cage w/ Extension Arms:
 - 1. Manufacturer: SportsField Specialties, Inc.
Contact: Scott Vantyle, Regional Manager
Ph: 607.437.3502
e-mail: scott.vantyle@sportsfield.com
 - 2. Model: DCHSEA and DCHSBNS
Description: High School Discus cage with hinged stabilizer extension arms and Backup Net System
 - 3. Quantity: One (1)
 - 4. Concrete Foundations: Typical foundation included in the drawing package – Detail 06, Sheet L300. Contractor / Supplier to provide stamped and sealed drawings and calculations by a Colorado licensed professional engineer, for ground sleeve goal post concrete anchoring foundation structural design. Include this cost with the price of the goal posts.
 - 5. Acceptable Alternates / Substitutions: See 1.04 above.
- F. Discus Net Extension
 - 1. Manufacturer: SportsField Specialties, Inc.
Contact: Scott Vantyle, Regional Manager

Ph: 607.437.3502

e-mail: scott.vantyle@sportsfield.com

2. Model: DCNE20

Description: Discus cage net extension – Pole Height = 21'h. Net Height = 20'h.

3. Quantity: One (1) @ approx. 140' long (7 – 20'l. sections)

4. Concrete Foundations: Typical foundation included in the drawing package – Detail 06, Sheet L300. Contractor / Supplier to provide stamped and sealed drawings and calculations by a Colorado licensed professional engineer, for ground sleeve goal post concrete anchoring foundation structural design. Include this cost with the price of the goal posts.

5. Acceptable Alternates / Substitutions: See 1.04 above.

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, GENERAL

- A. Comply with manufacturer's written installation instructions unless more stringent requirements are indicated. Complete field assembly of equipment and nets where required.
- B. Install field equipment level, plumb, true, and positioned at locations indicated on Drawings.

3.03 CLEANING

- A. After completing playfield equipment and structures installation, inspect components. Remove spots, dirt, and debris. Repair damaged finishes to match original finish or replace component.

END OF SECTION

SECTION 122400 - WINDOW SHADES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Interior manual roller shades (WT-01).
- B. Interior motorized roller shades (WT-02 & WT-03).

1.02 SUBMITTALS

- A. Product Data: Provide manufacturer's standard catalog pages and data sheets, including materials, finishes, fabrication details, dimensions, profiles, mounting requirements, and accessories.
 - 1. Motorized Shades: Include power requirements and standard wiring diagrams for specified products.
- B. Shop Drawings: Include shade schedule indicating size, location and keys to details, head, jamb and sill details, mounting dimension requirements for each product and condition, and operation direction.

1.03 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 3 years of documented experience with shading systems of similar size and type.

1.04 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.

1.05 FIELD CONDITIONS

- A. Do not install products under environmental conditions outside manufacturer's absolute limits.

1.06 WARRANTY

- A. Roller Shade Hardware and Chain Warranty: Manufacturer's standard non-depreciating, transferrable warranty for interior shading.
 - 1. Shade Hardware – 10 years unless otherwise indicated:

2. Standard Shadecloth: Manufacturer's standard 25-year warranty.
3. Roller Shade Installation: One year from date of Substantial Completion, not including scaffolding, lifts or other means to reach inaccessible areas, which are deemed owners responsibility.

PART 2 PRODUCTS

2.01 Manufacturers

- A. Basis-of-Design Product: Subject to compliance with requirements, provide products as manufactured by Mecho.
 1. Manually Operated: Mecho/7 System
 - a. Additional Manufacturers:
 - 1) Hunter Douglas
 - 2) SWF Contract
 2. Motorized Shades: Mecho ElectroShade
 - a. Additional Manufacturers:
 - 1) Hunter Douglas
 - 2) SWF Contract
- B. Requests for substitutions will be considered in accordance with the provisions of Section 016000 "Substitution Procedures."

2.02 MANUALLY OPERATED SHADES WITH SINGLE ROLLERS

- A. Basis of Design: Mecho/7 System as manufactured by Mecho.
- B. Description: Manually operated fabric window shades.
 1. Shade Type: Single Roller.
 2. Universal drive capability to offset drive chain for reverse or regular roll shades.
 3. Drop Position: Regular roll.
 4. Mounting: Ceiling mounted.
 5. Mounting: Recessed in ceiling pocket.
 6. Mounting: Wall Mounted.
 7. Mounting: Window Jamb Mounting.
 8. Size: As indicated on drawings.
 9. Fabric: As indicated under Finish Schedule
- C. Brackets and Mounting Hardware: As recommended by manufacturer for mounting indicated and to accommodate shade fabric roll-up size and weight.
 1. Material: Steel, 1/8 inch (3 mm) thick. Styrene based plastics, and /or polyester, or reinforced polyester shall not be accepted.
 2. Single Shade Operation Width: Up to 180 inches (4572 mm) dependent on fabric.
 3. Radiused Center Support Brackets: Provide brackets and connectors for radiused window applications.
 - a. Maximum Offset: Eight degrees on each side for a 16 degree total offset.

- D. Roller Tubes:
1. Material: Extruded aluminum.
 2. Size: As recommended by manufacturer; selected for suitability for installation conditions, span, and weight of shades.
 3. Fabric Attachment: Utilize extruded channel in tube to accept vinyl spline welded to fabric edge. Shade band to be removable and replaceable without removing roller tube from brackets or inserting spline from the side of the roller tube.
 4. Roller tubes to be capable of being removed and reinstalled without affecting roller shade limit adjustments.
- E. Hembars: Designed to maintain bottom of shade straight and flat.
1. Style: Full wrap fabric-covered bottom bar, flat profile with heat sealed closed ends.
- F. Clutch Operator: Manufacturer's standard material and design integrated with bracket/brake assembly.
1. Heavy-duty, 1/8" steel mounting bracket and integrated steel brake, clutch and sprocket assembly rigidly affix the shade support and user control to the building structure fully independent of the roller tube components.
 2. Permanently lubricated maintenance-free brake assembly employs an oil-impregnated steel hub with wrapped spring clutch.
 3. Brake must withstand minimum pull force of 50 pounds (22.7 kg) in the stopped position.
 4. Direct drive clutch requires no interstitial gear stages or plastic parts between the building structure and clutch ensuring reliable operation across the full range of shade sizes.
 5. Urethane dampened clutch protects bead chain and clutch from failure due to high shock loads during shade operation minimizing down time.
 6. Maximum shade hanging weight of 50 pounds (22.7 kg).
 7. Clutch shall be upgradable to motorized drive on compatible tubes without requiring change in mounting attachment method/location, roller tube or fabric band.
 8. Motorized drive options available require no additional wiring to be added for power or communication capability for switch or automated operation.
- G. Drive Chain: Continuous loop T304 stainless steel beaded ball chain, 100 pound (45 kg) minimum breaking strength warranted from breaking for the life of the shade system hardware under prescribed operation. Provide upper and lower limit stops.
1. Chain Tensioner: Chain tensioning device complying with ANSI/WCMA A100.1-2022.
 2. Limit stops: Bead stops affixed to the chain maintain consistent shadeband alignment at the top and bottom of shade travel across multiple shades, and help prevent shade damage resulting from unmanaged user control.
- H. Managed Lift Force, Hardware: Lifts single band or multiband shade assemblies:
1. Lifting Force: 3 to 8.5 pounds (1.4 to 3.9 kg) max pull force to lift shade assemblies with a shade band hanging weight, not including mounting hardware, of up to 50 pounds (22.7 kg).
 2. Direct drive clutch with Managed Lift Force provides the best user experience by managing the user pull force while using the fewest number of chain pulls to position a shade.
 3. Backward compatible to Mecho/5 components including fascia, regular and reverse roll, pockets, and wall-mounting accessories.
 4. Includes offset drive capability, left/right, front, or back to allow for utilization of blackout channels.

5. Allows for ease of operation when obstructions do not allow for direct drive chain access.
 6. Offset chain drive shall not cause an increase of friction or pull force when operated up to a 26 degree angle from vertical.
- I. Accessories:
1. Fascia: Removable extruded aluminum fascia, size as required to conceal shade mounting, attachable to brackets without exposed fasteners.
 - a. Finish: Baked enamel.
 - 1) Color: Match Window Frame – See Finish Schedule
 - b. Can be installed across two or more shade bands in one piece.
 - c. Single Fascia: Accommodate regular roll shades.
 - d. Profile: Square.

2.03 MOTOR OPERATED, SINGLE ROLLER SHADES

- A. Shade System; General:
1. Motorized Shades: Comply with NFPA 70.
 2. Components capable of being removed or adjusted without removing mounted shade brackets or cassette support channel.
 3. Operates smoothly when raising or lowering shades.
 4. Cradle-to-Cradle certified and listed in C2C (DIR).
 5. Electrical Components: Listed, classified, and labeled as suitable for intended purpose. Test as total system. Individual component testing is acceptable.
 - a. Components: FCC compliant where applicable.
- B. Basis of Design: ElectroShade with WhisperShade IQ2 EDU. As manufactured by MechoShade Systems LLC. Motor operated fabric window shade system complete with mounting brackets, roller tubes, hembars, hardware, and accessories.
1. Voltage: 120 VAC
 2. Description: Single roller.
 3. Drop Position: Regular roll.
 4. Mounting: Window jamb mounted.
 5. Size: As indicated on drawings.
 6. Fabric: As indicated under Finish Schedule
 7. Brackets and Mounting Hardware: As recommended by manufacturer for mounting indicated and to accommodate shade fabric roll-up size and weight.
 - a. Material: Provide shade hardware constructed of minimum 1/8-inch (3.18 mm) thick plated steel, or heavier, thicker, as required to support 150 percent of the full weight of each shade. Plastic components without use of steel angle construction do not meet the intent of this specification and shall not be accepted. Styrene based plastics, and /or polyester, or reinforced polyester shall not be accepted.
 - b. Provide shade hardware system that allows for field adjustment of motor or replacement of any operable hardware component without requiring removal of brackets, regardless of mounting position (inside, or outside mount).
 - c. Provide shade hardware system that allows for operation of multiple shade bands offset by a maximum of 8-45 degrees from motor axis between shade bands (4-22.5

- degrees) on each side of the radial line, by a single shade motor (multi-banded shade, subject to manufacturer's design criteria).
- d. Radiused Center Support Brackets: Provide brackets and connectors for radiused window applications.
 - 1) Maximum Offset: 22.5 degrees on each side for a 45 degree total offset.
 - 2) Maximum Offset: 8 degrees on each side for a 16 degree total offset.
 - 8. Roller Tubes:
 - a. Material: Extruded aluminum.
 - b. Size: As recommended by manufacturer; selected for suitability for installation conditions, span, and weight of shades.
 - c. Fabric Attachment: Utilize extruded channel in tube to accept vinyl spline welded to fabric edge. Shade band to be removable and replaceable without removing roller tube from brackets or inserting spline from the side of the roller tube.
 - 9. Hembars: Designed to maintain bottom of shade straight and flat.
 - a. Style: Full wrap fabric covered bottom bar, flat profile with heat sealed closed ends.
 - b. Room-Darkening Shades: Provide a slot in bottom bar with wool-pile light seal.
 - 10. Accessories:
 - a. Fascia: Removable extruded aluminum fascia, size as required to conceal shade mounting, attachable to brackets without exposed fasteners.
 - 1) Finish: Baked enamel per finish schedule.
 - 11. Room-Darkening Channels, Standard: Extruded aluminum side and center channels with brush pile edge seals, SnapLoc mounting base, and concealed fasteners. Channels to accept one-piece exposed blackout hembar to assure side light control and sill light control.
 - 12. ShadeLoc Channels: Extruded aluminum side and center channels consisting of mounting base, SnapLoc channel for capturing zippered edges of shade band, and rubber foam cushions to adjust for field conditions.

2.04 INTELLIGENT ENCODED ELECTRONIC DRIVE SYSTEM

- A. Electronic Drive Unit (EDU) System General Requirements:
 - 1. A UL 325 listed solution.
 - a. Component certification in lieu of system testing is not acceptable.
 - 2. Listing Label and Motor Rating: To be visible for inspection without dismounting of shade assembly to remove motor or EDU from shade roller tube.
 - 3. Size and Configuration: As recommended by manufacturer for type, size, and arrangement of shades.
 - 4. Conceal EDU inside shade roller tube.
 - 5. EDU Rated Speed: The same nominal speed for shades in the same room.
 - 6. Hanging Weight of Shade Band: 80 percent of rated lifting capacity of shade EDU and tube assembly.
 - 7. Capable of upgrading firmware from anywhere on network without touching the motor.
- B. Line Voltage EDU (120 VAC):
 - 1. Basis of Design: MechoShade Systems LLC; WhisperShadeIQ2 System. Tubular, asynchronous, integral AC motor and reversible capacitor. 120 VAC, single phase, 60 Hz; temperature Class B, thermally-protected, totally enclosed, maintenance-free.

Powered by line voltage power supply connection equipped with locking disconnect plug assembly furnished with EDU.

2. Audible Noise: 46 dBA measured 3 ft (914 mm) from motor unit, depending on motor torque.
3. Nominal Speed: 34 RPM. Not to vary due to load/lift capacity.
4. Isolated, low voltage power supply for powering external accessories connected to either the dry contact or network port.
 - a. Products requiring accessories to be powered by a plug-in or externally-supplied power supply are not acceptable

2.05 MOTOR CONTROLS, INTERFACES, AND ACCESSORIES

- A. Unless indicated to be excluded, provide required equipment as necessary for a complete operating system providing the control intent specified. Provide components and connections necessary to interface with other systems as indicated.
- B. Digital Network Controls:
 1. Low-voltage network utilizes standard Category 5/6 UTP cable; maximum of 4,000 feet (1,219 m), 250 nodes.
 2. Reprogram control without requiring wiring modifications.
 3. Ten-year non-volatile power failure memory for system configuration settings.
 4. Low-Voltage Wall Controls; IQ Switch:
 - a. Momentary dry contact switch enables manual local control or network control of any individual shade motor or shade group/sub-group.
 - b. Control Functions:
 - 1) Open: Automatically open controlled shades to fully open position when button is pressed.
 - 2) Close: Automatically close controlled shades to fully closed position when button is pressed.
 - 3) Presets: For selection of predetermined shade positions.
 - 4) Dual Stations: For individual control of two shades/groups.
 5. Finish: White.
 6. Single Station: 5-button (open, close, and three intermediate stop positions).

2.06 SHADE FABRIC

- A. Basis of Design: Shade fabric as manufactured by MechoShade Systems LLC. Fabric:
 1. 3% Open Fabric
 - a. EuroTwill: 6000 series. Finely woven. 3 percent open. Reverse side can be used facing interior if specified.
 - 1) NRC Rating: 0.10.
 - 2) SAA Rating: 0.14.
 - 3) Low-Emitting Material Certification: Greenguard Gold certified and listed in UL (GGG).

- 4) Health Product Declaration (HPD): Published declaration with full disclosure of known hazards.
 - 5) Environmental Product Declaration (EPD): Published disclosure of product's environmental impacts based on a full Life Cycle Assessment (LCA).
Manufacturer must have EPD certification by independent 3rd party evaluation service.
- 2. Blackout Shadecloths:
 - a. Fabric: Equinox Blackout: 0100 series. Opaque. PVC-Free.
 - b. NRC Rating: 0.05.
 - c. SAA Rating: 0.05.
 - d. Environmental Product Declaration (EPD): Published disclosure of product's environmental impacts based on a full Life Cycle Assessment (LCA). Manufacturer must have EPD certification by independent 3rd party evaluation service.

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. Replace shades that exceed specified dimensional tolerances at no extra cost to Owner.
- C. Adjust level, projection, and shade centering from mounting bracket. Verify there is no telescoping of shade fabric. Ensure smooth shade operation.

3.04 PROTECTION

- A. Protect installed products from subsequent construction operations.

- B. Touch-up, repair, or replace damaged products before Substantial Completion.

3.05 MAINTENANCE

- A. See Section 017000 - Execution and Closeout Requirements, for additional requirements relating to maintenance service.

END OF SECTION

SECTION 123200 - MANUFACTURED WOOD CASEWORK

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Manufactured standard and custom casework, with cabinet hardware.

1.02 RELATED REQUIREMENTS

- A. Section 079200 - Joint Sealants: Sealing joints between casework and countertops and adjacent walls, floors, and ceilings.
- B. Section 092116 - Gypsum Board Assemblies: Reinforcements in metal-framed partitions for anchoring casework.
- C. Section 092216 - Non-Structural Metal Framing: Reinforcements in metal-framed partitions for anchoring casework.
- D. Section 096500 - Resilient Flooring: Resilient wall base.
- E. Section 123600 - Countertops: Additional requirements for countertops.

1.03 DEFINITIONS

- A. Exposed: Portions of casework visible when drawers and cabinet doors are closed, including end panels, bottoms of cases more than 42 inches (1.066 m) above finished floor, tops of cases less than 72 inches (1.82 m) above finished floor and all members visible in open cases or behind glass doors.
- B. Semi-Exposed: Portions of casework and surfaces behind solid doors, tops of cases more than 72 inches (1.828 m) above finished floor and bottoms of cabinets more than 30 inches (0.762 m) but less than 42 inches (1.066 m) above finished floor.
- C. Concealed: Sleepers, web frames, dust panels and other surfaces not generally visible after installation and cabinets less than 30 inches (762 mm) above finished floor.

1.04 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.

1.05 ADMINISTRATIVE REQUIREMENTS

- A. Preinstallation Meeting: Conduct a preinstallation meeting one week prior to the start of the work of this section; require attendance by all affected installers.
- B. Keying Conference: Conduct conference prior to ordering keys. Incorporate conference decisions into keying submittal.

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 in this section, with not less than three years of documented experience and approved by manufacturer.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Protect items provided by this section, including finished surfaces and hardware items during handling and installation. For metal surfaces, use polyethylene film or other protective material standard with the manufacturer.
- B. Acceptance at Site:
 - 1. Do not deliver or install casework until the conditions specified under Part 3, Examination Article of this section have been met. Products delivered to sites that are not enclosed and/or improperly conditioned will not be accepted if warping or damage due to unsatisfactory conditions occurs.
- C. Storage:
 - 1. Store casework in the area of installation. If necessary, prior to installation, temporarily store in another area, meeting the environmental requirements specified under Part 3, "Site Verification of Conditions" Article of this section.

1.08 WARRANTY

- A. See Section 017800 - Closeout Submittals for additional warranty requirements.
- B. Correct defective Work within a five year period after Date of Substantial Completion, at no additional cost to Owner. Defects include, but are not limited to:
 - 1. Ruptured, cracked, or stained finish coating.
 - 2. Discoloration or lack of finish integrity.
 - 3. Cracking or peeling of finish.
 - 4. Delamination of components.
 - 5. Failure of adhesives.
 - 6. Failure of hardware.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Plastic Laminate Casework:

1. Case Systems: www.casesystems.com/#sle.
2. Diversified Fixture: www.diversifiedfixture.com/#sle.
3. Labscape LLC: www.labscape.com/#sle.
4. TMI.
5. Substitutions: See Section 016000 - Product Requirements.

2.02 CASEWORK, GENERAL

- A. Quality Standard: AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), unless noted otherwise.
- B. Plastic Laminate Faced Cabinets: Custom Grade.

2.03 FABRICATION

- A. Assembly: Shop assemble casework items for delivery to site in units easily handled and to permit passage through building openings.
- B. Construction: As required for selected grade.
- C. Edging: Fit shelves, doors, and exposed edges with specified edging. Do not use more than one piece for any single length.

2.04 PLASTIC-LAMINATE-CLAD CASEWORK

A. Plastic-Laminate-Faced Cabinet Construction:

1. Bottoms and Ends of Cabinets, Shelves, and Tops of Wall Cabinets and Tall Cabinets: 3/4-inch particleboard, plastic-laminate faced on exposed surfaces, melamine faced on semi-exposed surfaces.
 2. Backs of Cabinets: 1/2-inch particleboard, plastic-laminate faced on exposed surfaces, melamine faced on semi-exposed surfaces.
 3. Drawer Fronts: 3/4-inch particleboard, plastic-laminate faced on both sides.
 4. Drawer Sides and Backs: 1/2-inch melamine-faced particleboard, with glued dovetail or multiple- dowel joints.
 5. Drawer Bottoms: 1/4-inch melamine-faced particleboard glued and dadoed into front, back, and sides of drawers. Use 1/2-inch material for drawers more than 24 inches wide.
 6. Doors: 3/4-inch particleboard or medium-density fiberboard with wood stiles and rails, plastic- laminate faced on both sides.
 7. Shelves; 1 inch thick. Provide intermediate support for spans over 36 inches. Provide metal protected edge on shelving design to store musical instruments,
- B. Leg Shoes: Vinyl or rubber, black, open-bottom type.
 - C. Filler Strips: Provide as needed to close spaces between cabinets and walls, ceilings, and indicated equipment. Fabricate from same material and with same finish as cabinets.

2.05 CASEWORK HARDWARE

- A. Hardware, General: Provide manufacturer's standard powder-coated, commercial-quality, heavy-duty hardware complying with requirements indicated.
- B. Butt Hinges: Stainless-steel, semi-concealed, 5-knuckle, 2-3/4 inch hinges complying with BHMA A156.9, Grade 1, with antifriction bearings and rounded tips. Provide 2 hinges for doors less than 48 inches high and 3 hinges for doors more than 48 inches high.
- C. Door Catches: Zinc-plated, dual, self-aligning, permanent magnet catch. Provide 2 catches on doors more than 48 inches high.
- D. Drawer Slides: Zinc-plated, metal-channel, self-closing drawer slides, designed to prevent rebound when drawers are closed, with nylon-tired, ball-bearing rollers, and complying with BHMA A156.9, Type B05091, and rated for the following loads:
 - 1. Box Drawer Slides: 100 lbf.
 - 2. File Drawer Slides: 150 lbf.
 - 3. Pencil Drawer Slides: 45 lb.
 - 4. Keyboard Slide: 75 lbf.
 - 5. Drawer and Cupboard Locks: C
- E. Key all locks in each room the same. Every room shall be keyed different. Adjustable Shelf Supports: 2-pin locking plastic shelf rests complying with BHMA A156.9, Type B04013.
- F. Door & Drawer Hardware: Wire Pulls

PART 3 EXECUTION

3.01 EXAMINATION

- A. Site Verification of Environmental Conditions:
 - 1. Do not deliver casework until the following conditions have been met:
 - a. Building has been enclosed (windows and doors sealed and weather-tight).
 - b. An operational HVAC system that maintains temperature and humidity at occupancy levels has been put in place.
 - c. Ceiling, overhead ductwork, piping, and lighting have been installed.
 - d. Installation areas do not require further "wet work" construction.
- B. For Base Cabinets Installation: Examine floor levelness and flatness of installation space. Do not proceed with installation if encountered floor conditions required more than 1/2 inch (13 mm) leveling adjustment. When installation conditions are acceptable, for each space, establish the high point of the floor. Set and make level and plumb first cabinet in relation to this high point.
- C. For Wall Cabinets Installation: Examine wall surfaces in installation space. Do not proceed with installation if the following conditions are encountered:
 - 1. Maximum variation from plane of masonry wall exceeds 1/4 inch in 10 ft (6 mm/3 m) and 1/2 inch in 20 ft (13 mm/6 m) or more, and/or maximum variation from plumb exceeds 1/4 inch (6 mm) per story.

2. Maximum Variation of finished gypsum board surface from true flatness: 1/8 inch in 10 feet (3 mm in 3 m) in any direction.
- D. Verify adequacy of support framing and anchors.
- E. Verify that service connections are correctly located and of proper characteristics.

3.02 INSTALLATION

- A. Perform installation in accordance with manufacturer's instructions.
- B. Use anchoring devices to suit conditions and substrate materials encountered. Use concealed fasteners to the greatest degree possible. Use exposed fasteners only where allowed by approved shop drawings, or where concealed fasteners are impracticable.
- C. Set casework items plumb and square, securely anchored to building structure.
- D. Align cabinets to adjoining components, install filler and/or scribe panels where necessary to close gaps.
- E. Fasten together cabinets in continuous runs, with joints flush, uniform and tight. Misalignment of adjacent units not to exceed 1/16 inch (1.6 mm). In addition, do not exceed the following tolerances:
 1. Variation of Tops of Base Cabinets from Level: 1/16 inch (1.6 mm) in 10 feet (3 m).
 2. Variation of Faces of Cabinets from a True Plane: 1/8 inch (3 mm) in 10 feet (3 m).
 3. Variation of Adjacent Surfaces from a True Plane (Lippage): 1/32 inch (0.8 mm).
 4. Variation in Alignment of Adjacent Door and Drawer Edges: 1/16 inch (1.6 mm).
- F. Base Cabinets: Fasten cabinets to service space framing and/or wall substrates, with fasteners spaced not more than 16 inches (407 mm) on center. Bolt adjacent cabinets together with joints flush, tight, and uniform.
- G. Install hardware uniformly and precisely.
- H. Countertops: Install countertops intended and furnished for field installation in one true plane, with ends abutting at hairline joints, and no raised edges.
- I. Replace units that are damaged, including those that have damaged finishes.

3.03 ADJUSTING

- A. Adjust operating parts, including doors, drawers, hardware, and fixtures to function smoothly.

3.04 CLEANING

- A. Clean casework and other installed surfaces thoroughly.

3.05 PROTECTION

- A. Do not permit finished casework to be exposed to continued construction activity.

- B. Protect casework and countertops from ongoing construction activities. Prevent workmen from standing on, or storing tools and materials on casework or countertops.
- C. Repair damage, including to finishes, that occurs prior to Date of Substantial Completion, using methods prescribed by manufacturer; replace units that cannot be repaired to like-new condition.

3.06 PLASTIC LAMINATE SCHEDULE

A. Laminates (PL)

- 1. PL-01 – Plastic Laminate – Formica – 8844-WR Aged Ash, Wood Brush Texture
- 2. PL-02 – Plastic Laminate – Wilsonart – D354 Designer White

END OF SECTION

SECTION 123600 - COUNTERTOPS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Countertops for manufactured casework.
- B. Wall-hung counters.

1.02 RELATED REQUIREMENTS

- A. Section 123200 - Manufactured Wood Casework.

1.03 REFERENCE STANDARDS

- A. ASTM A666/A666M - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2024.
- 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. ISFA 3-01 - Classification and Standards for Quartz Surfacing Material; 2013.
- F. NEMA LD 3 - High-Pressure Decorative Laminates; 2005.
- G. NSI (DSDM) - Dimensional Stone Design Manual, Version VIII; 2016.

1.04 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. Preparation instructions and recommendations.
 - 2. Storage and handling requirements and recommendations.
 - 3. Specimen warranty.
- C. Shop Drawings: Complete details of materials and installation .
- D. Test Reports: Chemical resistance testing, showing compliance with specified requirements.

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.

PART 2 PRODUCTS

2.01 COUNTERTOPS

- A. Epoxy Resin Tops (Kemresin): Epoxy Resin tops shall consist of modified epoxy resin that has been especially compounded and cured to provide the optimum physical and chemical resistance properties required of a heavy-duty laboratory table top. Tops and curbs shall be a uniform mixture throughout their full thickness and shall not depend upon a surface coating that is readily removed by chemical and/or physical abuse. Tops shall be 1" thick, exposed edges with a 1/8", 45-degree bevel on top and bottom and drip grooves provided on the underside at all exposed edges. 4" high curbs at the backs and ends of tops shall be 1" thick and bonded to the deck to form a square watertight joint. Sink cutouts shall be smooth and uniform without saw marks with the top edge beveled. The bottom edge of the sink opening shall be finished smooth with the edge broken to prevent sharpness. Corners of sink cutouts shall be radiused not less than 3/4". Color to be black.
 - 1. Integral Epoxy Sinks
- B. Solid Surfacing Countertops: Solid surfacing sheet or plastic resin casting self-supporting over structural members.
 - a. Manufacturers:
 - 1) Basis of Design: Corian Solid Surface
 - (a) SSM-03 – Dove
 - 2) Alternate MFR.
 - (a) Wilsonart
 - (b) LG Hausys
 - 2. Back and End Splashes: Same sheet material, square top; minimum 4 inches (102 mm) high.
 - 3. Fabricate in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), Section 11 - Countertops, Premium Grade.
- C. Stainless Steel Countertops: , Type 304, stainless steel sheet; 16 gauge, 0.0625 inch (1.59 mm) nominal sheet thickness.
 - 1. Finish: 4B satin brushed finish.
 - 2. Exposed Edge Shape: Bullnose with return; 5/8 inch (16 mm) radius, return to face of case.
 - 3. Back and End Splashes: Same material; welded 1/4 inch (6 mm) radius coved joint to countertop; square top edge with 1 inch (25 mm) wide top surface and minimum 1/2 inch (12 mm) turndown.

4. Splash Dimensions: 4 inch (100 mm) high by 1 inch (25 mm) thick, unless otherwise indicated.
- D. Natural Quartz and Resin Composite Countertops: Sheet or slab of natural quartz and plastic resin over continuous substrate.
 1. Flat Sheet Thickness: 1-1/4 inch (32 mm), minimum.
 2. Natural Quartz and Resin Composite Sheets, Slabs and Castings: Complying with ISFA 3-01 and NEMA LD 3; orthophthalic polyester resin, mineral filler, and pigments; homogenous, non-porous and capable of being worked and repaired using standard stone fabrication tools; no surface coating; color and pattern consistent throughout thickness.
 - a. Manufacturers:
 - 1) Dal-Tile Corporation[<>]: www.daltile.com/#sle.
 - 2) LG Hausys America, Inc; Viatera 3cm: www.lghausysusa.com/#sle.
 - 3) Wilsonart
 - 4) **Corian Quartz – Basis of Design.**
 - 5) Substitutions: See Section 016000-Product Requirements.
 3. Factory fabricate components to the greatest extent practical in sizes and shapes indicated; comply with NSI (DSDM).
 4. Surface Burning Characteristics: Flame spread index of 25, maximum; smoke developed index of 450, maximum; when tested in accordance with ASTM E84.
 5. NSF approved for food contact.
 6. Sinks: Separate units for undercounter mounting; minimum 3/4 inch (19 mm) wall thickness; comply with IAPMO Z124.
 7. Color and Pattern:
 - a. QZ-01 - Stratus White
 - b. QZ-02 – Dove Grey Leathered
 - c. QZ-03 - Grigione
 8. Other Components Thickness: 3/4 inch (19 mm), minimum.
 9. Exposed Edge Treatment: Built up to minimum 1-1/4 inch (32 mm) thick; square edge; use marine edge at sinks.
 10. Back and End Splashes: Same sheet material, square top; minimum 4 inches (102 mm) high.
 11. Skirts: As indicated on drawings.
 12. Fabricate in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), Section 11 - Countertops, Premium Grade.
 13. Fabricate in accordance with manufacturer's standard requirements.

2.02 MATERIALS

- A. Adhesives: Chemical resistant waterproof adhesive as recommended by manufacturer of materials being joined.

2.03 ACCESSORIES

- A. Fixed Top-Mounted Countertop Support Brackets:

1. Material: Steel.
2. Finish: Manufacturer's standard, factory-applied, textured powder coat.
3. Color: Black.

2.04 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 (25 mm) 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 (102 mm), unless otherwise indicated.
- C. Stainless Steel: Fabricate tops up to 144 inches (3,657 mm) long in one piece including nosings and back and end splashes; accurately fitted mechanical field joints in lengths over that dimension are permitted.
 1. Weld joints; grind smooth and polish to match.
 2. Provide stainless steel hat channel stiffeners, welded or soldered to underside, where indicated on drawings.
 3. Provide wall clips for support of back/end splash turndowns.
 4. Sound Deadening: Apply water resistant, fire resistant sound deadening mastic to entire bottom surface.
- D. Wall-Mounted Counters: Provide skirts, aprons, brackets, and braces as indicated on drawings, finished to match.

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. Securely attach countertops to cabinets using concealed fasteners. Make flat surfaces level; shim where required.
- B. Attach plastic laminate countertops using screws with minimum penetration into substrate board of 5/8 inch (16 mm).
- C. Attach stainless steel countertops using stainless steel fasteners and clips.
- D. Seal joint between back/end splashes and vertical surfaces.

3.04 TOLERANCES

- A. Variation From Horizontal: 1/8 inch in 10 feet (3 mm in 3 m), maximum.
- B. Offset From Wall, Countertops: 1/8 inch (3 mm) maximum; 1/16 inch (1.5 mm) minimum.
- C. Field Joints: 1/8 inch (3 mm) wide, maximum.

3.05 CLEANING

- A. Clean countertops 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

SECTION 126613 - TELESCOPING BLEACHERS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Telescoping bleachers.
- B. Electric motor operators, controls, and internal wiring.
- C. Section Includes: telescopic Gym Seating includes electrically operated multiple-tiered seating rows comprising of seat, deck components, understructure that permits closing without requiring dismantling, into a nested configuration for storing or for moving purposes.

1.02 RELATED REQUIREMENTS

- A. Section 260583 - 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; 2024.
- F. AWS B2.1/B2.1M - Specification for Welding Procedure and Performance Qualification; 2021, with Errata (2023).
- G. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2025, with Errata (2026).
- H. AWS D1.3/D1.3M - Structural Welding Code - Sheet Steel; 2018, with Errata (2022).
- I. NFPA 102 - Standard for Grandstands, Folding and Telescopic Seating, Tents, and Membrane Structures; 2021.
- J. PS 1 - Structural Plywood; 2023.

1.04 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. 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. 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.
- E. 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: Welding processes and welding operators qualified in accordance with AWS D1.1/D1.1M, AWS D1.3/D1.3M, and no more than 12 months before the start of scheduled welding work.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Store, in original packaging, under cover and elevated above grade.

1.07 WARRANTY

- A. See Section 017800 - Closeout Submittals, for additional warranty requirements.
- B. Manufacturer's Warranty: Includes the repair or replacement of the defective product; or defective component thereof, with a comparable product; or component thereof, or a refund of the purchase price prorated over the warranty period.
 1. Includes: labor, materials, and freight for replacement or repairs.
 2. Structural Component parts of Understructure Warranty Period: 10 years from Date of Acceptance.
 3. Decking systems, seating collections, electrical, portable and integral dolly systems, end closure curtains, surface material finishes Warranty Period 5 years from Date of Acceptance.
- C. 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 (Gym Locations):
 - 1. Basis of Design:
 - a. **Hussey Seating Company; MAXAM Telescopic Bleachers**
 - 2. Interkal LLC: www.interkal.com/#sle.
- B. Telescoping Bleachers (Auditorium):
 - 1. Basis of Design:
 - a. **Hussey Seating Company; MAXAM+ Telescopic Bleachers**
 - 2. Interkal LLC: www.interkal.com/#sle.
 - 3. Irwin Telescopic Seating Company: www.irwintelescopicseating.com/#sle.

2.02 TELESCOPING BLEACHERS

- A. Telescoping Bleachers: Factory assembled tiered benches that retract horizontally into depth approximately the same as a single row depth, with fixed seats mounted on leading edge of platforms.
 - 1. Provide a design certified by a licensed Professional Engineer licensed in the State in which the Project is located.
 - 2. 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.
 - 3. 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.
 - 4. Operation: Motor operated.
- B. Design Loads: Design to withstand the following loading conditions:
 - 1. Uniformly distributed live load of not less than 100 psf (4.79 kN/m²) of gross horizontal projection.
 - 2. Live Load on Structural Supports: 100 psf (4.8 kPa), minimum, of gross horizontal projection.
 - 3. Live Load on Seats and Walking Surfaces: 120 pounds per linear foot (1750 N/m).
 - 4. Lateral Sway Stress on Structural Supports: 24 pounds per linear foot (350 N/m) of seat plank.
 - 5. Perpendicular Sway Stress on Structural Supports: 10 pounds per linear foot (146 N/m) of seat plank.
 - 6. Parallel and Perpendicular sway loads are not applied concurrently.
- C. Dimensions:
 - 1. Main & Aux Gym
 - a. See drawings for overall dimensions and number of Seats listed on CP1.1.
 - b. Rows: As indicated on Drawings.
 - c. Rise Per Row: 11 5/8" inches
 - d. Row Depth: 24 inches

2. Auditorium
 - a. See drawings for overall dimensions and number of seats listed on CP1.1
 - b. Rows: As indicated on drawings
 - c. Rise Per Row: 11 5/8"
 - d. Row Depth: 34 inches
- D. Structural Supports: Steel or aluminum; manufacturer's standard wheeled carriages supporting each tier separately, with moving parts permanently lubricated and metal parts cushioned to prevent metal-to-metal contact during operation.
 1. Design so that each row carriage so that it will individually support the design loads and is self supporting when fully assembled without dependence on platform panels or boards, seats, or fascia.
 2. Welding: In accordance with AWS D1.1/D1.1M and AWS D1.3/D1.3M.
 3. Bolting: Use lock-washers or locknuts.
 4. Wheels: Minimum 5 inch (125 mm) diameter by 1-1/8 inch (28 mm) 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. Hardware Finish: Zinc-plated, Rust inhibiting black finish.
 7. Posi-locks and other surfaces: Powdercoated black, Rust inhibiting black finish.
 8. Nose beam and Rear Riser beam: Nose beam shall be continuously roll-formed closed tunular shape of ASTM A653 grade 40 (276 MPa). Riser beam shall be continuously roll-formed of ASTM A653 Grade 64 (441 MPa). Nose and Riser beam shall be designed with no steel edges exposed to spectator after product assembly. Nose beam and riser beam are trough-bolted fore/aft to deck stabilizers and frame cantilevers to create the deck structure.
 9. Frame: The frames are welded assemblies (one left hand, one right hand per tier) comprised of the following components:
 - a. Lower Track subassembly: ASTM A1011 Grade 50: Continuous positive Interglide System (casterhorn) interlocks each adjacent frame casterhorn using an integral, continuous, anti-drift feature and captive interlock with adjustable row spacing at front to prevent separation and misalignment.
 - b. Lower Track Wheels: 3 per frame Not less than 5 inches in diameter by 1-1/4 inches with non-marring soft rubber face to protect wood and synthetic floor surfaces, with molded-in sintered iron oil - impregnated bushings to fit 3/8" diameter axles secured with E-type snap rings.
 - 1) Option: Up to 6 wheels per frame for load distribution.
 - c. Slant Columns: A500 Grade B, tubular shape.
 - d. Cantilever Subassembly: Consists of ASTM A1011 Grade 50 nose connection plate, cantilever, and riser attachment plate welded together into a subassembly.
 10. Lock System: Casterhorns at the end sections of powered banks (minimally), and manual sections, contain a Low Profile Posi-Lock LX to lock each row in the open position and allow unlocking automatically. Provide adjustable stops to allow field adustment of row spacings.
 11. Sway Bracing: ASTM A653 grade 40 (276 MPa), tension members bolted to columns.
 12. Deck Stabilizer: A1011 Grade 45, member through-bolted to nose and riser at three locations per section. Securely captures front and rear edge of decking at rear edge of nose beam and lower edge of riser beam for the entire length of section. Interlocks with

- adjacent stabilizer on upper tier using low-friction nylon roller to prevent separation and misalignment.
13. Row Locking: Automatically mechanically lock each carriage to adjacent carriages when fully extended.
 14. Unlocking: Automatically unlock all rows before engaging retraction mechanism.
- E. Fasteners: Vibration proof, in manufacturer's standard size and material.
- F. 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. Control Station: Remote Control - enables un-tethered operator management of stop, start, forward, and reverse control of the power system.
 - a. Enables un-tethered operator management of stop, start, forward, and reverse control of the power system.
 - b. Grants and confirms access only to an authorized controller, denying operation by spurious signals.
 - c. Terminates access shortly after completed operation, requiring re-approval to resume operation.
 - d. The manufacturer shall provide and install Access Control Unit and remote Controller, and shall provide Remote Control Transmitters.
 5. Default Operation shall be with a removable pendant control unit which plugs into seating bank for tethered operator management of stop, start, forward, and reverse control of the power operation.
 6. PF1/2/3/4: Furnish and install Hussey PF (1/2/3/4), an integral automatic electro mechanical power frame propulsion system, to open and close telescopic seating.
 - a. Electrical - Seating Manufacturer shall provide all wiring within seating bank, including pendant control. Motors, housing, and wiring shall be installed and grounded in complete accord with the National Electrical Code. The control system shall operate at low voltage (24V). The electrical contractor shall perform all connections at and upstream of the equipment specified herein and ensure that supplied voltage drops no more than 4% below nominal where power connects thereto.
 - b. Each unit for PF (1/2/3/4) is driven by a 1/2 horsepower, 1725 RMP motor.
 - 1) 115V 1 Phase
 - (a) This 1.25 Service Factor motor runs on 115V at 60 Hz and draws a full load current of 6.2 amperes. The required power supply shall be a single phase of 115 Volts, plus neutral plus ground, each with current capacity per the following schedule.

1	15 Amps when 1 or 2 motors on the power supply.
2	30 Amps when 3 or 4 motors on the power supply.
3	40 amps when 5 or 6 motors on the power supply.
 - (b) This system shall consist of UL Listed or Recognized components throughout (motors, circuit protection, motor controls, user interface, enclosures, conductors and connectors, all correctly sized and compatible under maximum rated load on the motors).

7. Limit Switches: Automatically stop operation when unit has reached fully open or fully closed position.
 8. Provide all wiring internal to bleacher units, to junction box located where indicated; ensure that wiring is not energized except during operation.
 9. Electrical Characteristics: 120V, single phase, 60 Hz.
 10. Provide access to motor from front side of bleachers; a hinged front skirt or hinged section at least 30 inches (760 mm) wide is acceptable.
- G. Annual Service Light
1. The annual service light unit is a low voltage (24V) system this is integrated into the electrical control system on a powered bleacher.
 - a. This system shall be UL Listed under UL Product Category FHJU, titled Electrical Drive and Controls for Folding and Telescopic Seating (UL File No. E467277).
 - b. This unit serves two main functions:
 - 1) Keep a continuous timer running that will indicate to the end user that an annual inspection of the bleacher is required.
 - (a) The unit will retain the counting data for no less than 6 months without power.
 - (b) There will be a light illuminated at the front of the bleacher once the counter reaches one calendar year.
 - (c) The counter and light can be reset by authorized personnel once a inspection has been completed.
 - 2) Record the forward, reverse, and total operating time of bleacher.
 - (a) This data can be viewed at any time from inside of the unit.
 - 3) The manufacturer shall furnish parts and instructions for installing an annual service light unit on the primary seating bank.

2.03 FABRICATION

- A. Fabricate understructure from structural-steel members in size, spacing, and form required to support design loads specified in referenced safety standards.
- B. Weld understructure to comply with applicable AWS standards.
- C. Round corners and edges of components and exposed fasteners to reduce snagging and pinching hazards.
- D. Form exposed sheet metal with flat, flush surfaces, level and true in line, and without cracking and grain separation.

2.04 SEAT AND PLATFORM COMPONENTS

- A. Polymer Seat System: Courtside Collection XCS12 (Gymnasium Locations)
 1. Material: Gas assist injection-molded, 100 percent recyclable HDPE, high density polyethylene.
 2. Module Size: 18 inches long by 10 inches wide and 12 inches deep.
 3. Module Load: Tested to 600 lbs.
 4. Seat height range from deck to top of seat: 16 1/8" to 18-1/4"

5. Integrally molded end caps at aisle end locations.
 6. Integrally molded recess pockets to accept seat number and row letters.
 7. Integrally molded rear closure panel at back of seat to allow for "continuous clean sweep" of debris at deck level and minimized visibility of structural ribbing.
 8. Color: As selected by the Architect from the manufacturers 15 standard colors.
- B. Gallery3 Traditional Series: (Auditorium Locations)
1. See 126100 For additional information.
- C. 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 (16 mm), minimum, AC grade tongue and groove Southern Yellow Pine with clear urethane, high gloss finish.
 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.

2.05 ADA Accessible Seating

- A. Locate first tier modular units to provide wheelchair-accessible seating at locations indicated on the drawings.
1. Flex-Row: Provide first row modular recoverable seating units that can be closed to accommodate persons requiring ADA Spaces (or any other temporary space needs) or opened for standard usage. Each Flex-Row unit shall have a handle for easy operation.
 - a. Provide a black full-surround steel skirting with no more than 3/4" floor clearance for safety and improved aesthetics.
 - b. Provide a black injection molded end cap for the nose beam for safety and improved aesthetics.
 - c. Provide mechanical positive lock when the Flex Row System is in both the open and closed position. handle shall unlock the modular recoverable seating unit for operation.
 - d. Flex-Row can be utilized with the full system in the open or closed position.
 - e. Flex-Row modular units are designed to achieve multi-use front row seating to accommodate team seating, ADA requirements and facility specific requirements. Flex-Row units are available in modular units from 2 to 7 seats wide as well as full section widths.

2.06 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.
 - a. Removable/Store in Place
 2. End of Row Guardrails: Self-storing, at open ends of sections beginning at row 2.
 3. Top Row Rear Guardrail: Non-removable self-storing, mounted behind rear seat with tubular supports, running full width of section.
 4. Height: 42 inches (1067 mm) above adjacent platform or tread.

5. Removable Railings: Provide steel post sockets attached to platform supports.
- B. Design handrails and railings to withstand the following loads:
 1. Concentrated Load on Handrails: 200 pounds (890 N) in any direction.
 2. Concentrated Load on Guardrails: 200 pounds (890 N) in any direction along top rail.
 3. Live Load on Handrails: 50 pounds per linear foot (790 N/m), applied in any direction.
 4. Live Load on Guardrails:
 - a. Horizontal: 50 pounds per linear foot (790 N/m), applied at the guardrail height.
 - b. Vertical: 100 pounds per linear foot (1460 N/m), applied vertically to top of guardrail.
- C. Railing Construction: Round steel pipe or tube, with formed elbows at corners and caps at ends of straight runs.
 1. Steel: 1-1/2 inch (38 mm) minimum outside diameter, with 11 gauge, 0.12 inch (3.05 mm) minimum wall thickness; textured powder coat epoxy finish.
- D. Skirt Panel: on 1 st Row, provide galvanized steel front skirt panel to prevent players/objects from sliding underneath the first row.
- E. Steps
 1. Sure-Step: Permanently hinged to the front row to ensure availability and ease of operation. Two 3" diameter x 3/4" wide non-marking front wheels are provided so that the system can be operated with the Sure-Step in the stored or deployed position. All edges coined, hemmed or radiused with front edge protective rubber bumpers. Abrasive-backed non-slip tread identifier on leading edge of nosing. For aisle widths greater than 6'-0", two side by side hinged steps are provided.
 2. Intermediate Aisle Steps: Fully enclosed, at each vertical aisle. Full radius end caps on all four edges. Adhesive-backed abrasive non-slip tread surface.

2.07 ACCESSORIES

- A. Fillers and Closures:
 1. Ends of Retracted Units: Vinyl curtain.
 2. Top Row: Provide seat level rear filler panels to close openings between top row seat and wall; finish to match platforms.
 3. Back of Units: Full width plywood panels, finished to match platforms, up to 8 feet (2.44 m) above floor; vinyl curtains above to underside of top platform.
 4. Sides of Extended Units: Vinyl curtains.
 5. Vinyl Curtains: 18 ounce (510 g) 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.
- D. Semi-Permanent Media Platform on top of Bleacher in Main Gym.

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.
- D. Tolerances:
 - 1. Flooring and rear wall: Level and Plumb withing 1/8" in 8'-0"
 - 2. Maximum bleacher force on the floor of a 27 foot section: Static point load of less than 300 psi.
- E. Install telescoping stands to comply with referenced standard and manufacturer's written instructions.

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 MAINTENANCE SERVICE

- A. Service Capability: Show proof of full-time service capability by factory certified technicians directly employed by the installer.
 - 1. A four to eight-hour maximum on-site repair response is required during normal working hours, 8 a.m. to 5 p.m. weekdays (excluding holidays).
 - 2. All Full Time Service personnel shall be factory Authorized and Trained.
 - 3. Provide proof of Service Capability and a list of service parts regularly maintained in inventory.

3.07 DEMONSTRATION

- A. Engage a factory-authorized service representative to train the Owner's maintenance personnel to adjust, operate, and maintain telescoping stands.

3.08 CLOSEOUT ACTIVITIES

- A. Demonstration and Training: Provide manufacturer's field representative to demonstrate to and train Owner's operating personnel in proper operation of equipment.
 - 1. Location: On site using installed equipment.
 - 2. Time: As agreed between Owner and Contractor.

3.09 PROTECTION

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

END OF SECTION

SECTION 129300 – SITE FURNISHINGS

PART 1 - GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Bike Racks
 - 2. Trash Receptacles
 - 3. Picnic Tables
- B. Related Sections:
 - 1. Division 10 – “Ground-Set Flagpoles”

1.02 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Samples: For each product and for each color, texture or type specified.

1.03 SUBSTITUTIONS

- A. Products specified herein shall be the basis of design. Substitutions for specific materials will be accepted except under the following conditions. Alternative proposals must be fully supported by necessary documentation showing compatibility/comparability with specific materials. Substitution requests must also comply with the General Conditions.

PART 2 - PRODUCTS

2.01 BIKE RACKS

- A. Approved Manufacturer:
 - 1. PW Sport & Site
 - a. Web: www.pwathletic.com
 - b. Ph: 966.295.7028
 - c. Local Representative: Recreation Plus
 - d. Contact: Miriam Hootstein
 - e. Ph: 303.278.1455
 - f. Email: miriam@recreationplus.com
- B. Model: Arch
 - 1. Part No.: 1604-16
 - a. Description: Steel double-sided rack, 13”h., 1-7/8” O.D., 16-space rack, 10’-9” long
 - b. Color / Finish: galvanized
 - c. Mounting: Freestanding or Surface Mount, see Drawings
 - d. Quantity: Three (3)

C. Acceptable Alternates / Substitutions: See 1.3 above.

2.02 TRASH RECEPTACLE

A. Manufacturer:

1. Wabash Valley
 - a. PH.: 800.253.8619
 - b. Local Representatives:
 - 1) Recreation Plus
 - (a) 15209 West Ellsworth Drive
 - (b) Golden, CO 80401
 - (c) Contact: Miriam Hootstein
 - (d) Email: miriam@recreationplus.com
 - (e) Ph: 303.278.1455

B. Model: Signature Diamond Trash Receptacle Set, 32 gallon, includes liner and lid.

1. Finish: Plastisol-coated metal
2. Color: Purple
3. Mounting: Free-standing
4. Quantity: Four (4)

C. Acceptable Alternates / Substitutions: See 1.3 above.

2.03 PICNIC TABLES

A. Manufacturers:

1. Wabash Valley Manufacturing, Inc.
 - a. 505 E. Main Street
 - b. P.O. Box 5
 - c. Ph: 800.253.2102
 - d. Local Representative: Recreation Plus
 - 1) Contact: Miriam Hootstein
 - 2) Ph: 303.278.1455
 - 3) Email: miriam@recreationplus.com

B. Model / Type:

1. Style: Signature Perforated Picnic Table w/ Attached Seats
2. Size: 8' length
3. Color / Finish: Purple/Black.
4. Mounting: Free-standing
5. Quantity: Four (4)

C. Acceptable Alternates / Substitutions: See 1.3 above.

2.04 TABLES/CHAIRS

A. Manufacturers:

1. Wabash Valley Manufacturing, Inc.
 - a. 505 E. Main Street
 - b. P.O. Box 5
 - c. Ph: 800.253.2102
 - d. Local Representative: Recreation Plus
 - 1) Contact: Miriam Hootstein
 - 2) Ph: 303.278.1455
 - 3) Email: miriam@recreationplus.com
- B. Model / Type:
 1. Style: Signature Round Diamond Picnic Table w/ Attached Seats
 2. Color / Finish: Purple/Black.
 3. Mounting: Free-standing
 4. Quantity: Three (3)
- C. Acceptable Alternates / Substitutions: See 1.3 above.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Comply with manufacturer's written installation instructions unless more stringent requirements are indicated. Complete field assembly of site furnishings where required.
- B. Unless otherwise indicated, install site furnishings after landscaping and paving have been completed.
- C. Install site furnishings level, plumb, true, and positioned at locations indicated on Drawings.
- D. Installation of products shall be in accordance with the plans and details and with the Manufacturer's recommendations.
- E. Site Furnishing and other equipment shall be installed in the locations and quantities shown on the plan and details.
- F. Where applicable, the Owner's Representative shall approve the site furnishing and equipment locations prior to fastening in place.
- G. If applicable, use templates, provided by the Manufacturer, to properly position mounting bolts.
- H. Clean surfaces of products a maximum of two days prior to the Substantial Completion Walkthrough. Exposed surfaces shall be free from concrete, soil, and other foreign materials.

END OF SECTION 129300

SECTION 142100 - ELECTRIC TRACTION ELEVATORS

PART 1 GENERAL

1.01 Section Includes

- A. Electric traction elevator systems.
- B. Maintenance contract.

1.02 Related Requirements

- A. Section 033000 - Cast-in-Place Concrete.
- B. Section 042000 - Unit Masonry.
- C. Section 096816 - Sheet Carpeting.
- D. Section 260533.13 - Conduit for Electrical Systems: Electrical conduit requirements.
- E. Section 260583 - Wiring Connections: Wiring connection requirements.

1.03 Reference Standards

- A. AAMA 611 - Specification for Anodized Architectural Aluminum; 2024.
- B. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.
- C. AISC 360 - Specification for Structural Steel Buildings; 2022, with Errata (2025).
- 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 B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2021.
- G. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric); 2021.
- H. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2025, with Errata (2026).
- I. NEMA LD 3 - High-Pressure Decorative Laminates; 2005.
- J. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- K. NFPA 80 - Standard for Fire Doors and Other Opening Protectives; 2025.

1.04 Submittals

- A. See Section 013000 - Administrative Requirements for submittal procedures.
- B. 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 machine beams, guide rails, buffers, ropes, and other components.
 - 3. Rail bracket spacing; maximum loads imposed on guide rails requiring load transfer to building structural framing.
 - 4. Clearances and over-travel of car and counterweight.
 - 5. Locations in hoistway and machine room of traveling cables and connections for car lighting, telephone, and other items.
 - 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.
- C. Samples: Submit samples illustrating car floor material, car interior finishes, car and hoistway door and frame finishes, handrail material and finish, finish color selection brochures.
- D. Operation and Maintenance Data:
 - 1. Parts catalog with complete list of equipment replacement parts; identify each entry with equipment description and identifying code.
 - 2. Operation and maintenance manual.
 - 3. Schematic drawings of equipment and wiring diagrams of installed electrical equipment with list of corresponding symbols to identify markings on machine room and hoistway apparatus.
- E. Specimen warranty.
- F. Executed warranty.

1.05 Quality Assurance

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with minimum ten years documented experience.
- B. Installer Qualifications: Company specializing in performing work of the type specified and with at least five years of documented experience.
- C. Testing Agency Qualifications: Independent firm specializing in performing testing and inspections of type specified in this section.

1.06 Warranty

- A. See Section 017800 - Closeout Submittals for additional warranty requirements.

- B. Manufacturer Warranty: Provide 1-year manufacturer warranty for elevator operating equipment and devices. Complete forms in Owner's name and register with manufacturer.

PART 2 PRODUCTS

2.01 Manufacturers

- A. Electric Traction Elevators:
 - 1. KONE; KONE MonoSpace 300 DX: www.kone.us/#sle.
 - 2. Otis Elevator Company; Gen3 Core: www.otis.com/#sle.
 - 3. Basis of Design: TK Elevator; EOX – 3500lbs: www.tkelevator.com/#sle.
- B. Substitutions: See Section 016000 - Product Requirements.
- C. 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 Electric Traction Elevators

2.03 Components

- A. Elevator Equipment:
 - 1. Motors, Controllers, Controls, Buttons, Wiring, Devices, and Indicators: Comply with NFPA 70 requirements.
 - 2. Guide Rails, Cables, Counterweights, Sheaves, 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:
 - 4. Lubrication Equipment:
 - a. Provide grease fittings for periodic lubrication of bearings.
 - b. Grease Cups: Automatic feed type.
 - c. Lubrication Points: Visible and easily accessible.

2.04 Performance Requirements

- A. Regulatory Requirements: Comply with ASME A17.1, applicable local codes, 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. Perform welding of steel in accordance with AWS D1.1/D1.1M.
- E. Fabricate and install door and frame assemblies in accordance with NFPA 80 and complying with requirements of authorities having jurisdiction (AHJ).
- F. Perform electrical work in accordance with NFPA 70.

2.05 Operation Controls

- A. Elevator Controls: Provide landing operating panels, landing indicator panels, and signage.
 - 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.
 - 3. Comply with ADA Standards for elevator controls.
- B. Interconnect elevator control system with building security, fire alarm, card access, smoke alarm, and building management 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.
- D. Provide "Firefighter's Emergency Operation" in accordance with ASME A17.1, applicable building codes, authorities having jurisdiction (AHJ), and City of Gillette.

2.06 Operation Control Type

- A. Single Automatic (Push Button) Operation Control: Applies to car in single elevator shaft.
 - 1. Refer to description provided in ASME A17.1.
 - 2. Set system operation so that momentary pressure of landing button dispatches car from other landing to that landing.
 - 3. Allow call registered by momentary pressure of landing button at any time to remain registered until car stops in response to that landing call.
 - 4. If elevator car door is not opened within predetermined period of time after car has stopped at terminal landing, allow car to respond to call registered from other landing.

2.07 Materials

- A. Extruded Aluminum: ASTM B221 (ASTM B221M), natural anodized finish unless otherwise indicated.
- B. Flooring: RF-01
- C. Plastic Laminate: NEMA LD 3, Type HGS, color as selected by Architect from manufacturer's standard line of colors.

2.08 Car and Hoistway Entrances

- A. Elevator:
 - 1. Car and Hoistway Entrances, Main Elevator Lobby:
 - a. Framed Opening Finish and Material: Alkyd enamel on steel.
 - b. Car Door Material: Powder coat on steel, with rigid sandwich panel construction.

- c. Hoistway Door Material: Powder coat on steel, with rigid sandwich panel construction.

2.09 Car Equipment and Materials

A. Elevator Car:

1. Car Operating Panel: Provide main and auxiliary; flush-mounted applied face plate, with illuminated call buttons corresponding to floors served with "Door Open/Door Close" buttons, "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 (1372 mm) above car finished floor.
2. Flooring: RF-01
3. Front Return Panel: Match material of car door.
4. Door Wall: Plastic laminate on plywood.
5. Hand Rail: Aluminum, at three side walls. Provide open clearance space 1-1/2 inch (38 mm) wide to face of wall.
 - a. Aluminum Finish: Clear anodized.
6. Finishes: Architect to Select from Full range of colors.
7. Accessories:
 - a. Braille Signage Plates
 - b. Flush Mount LED Lighting

2.10 Finishes

- A. Powder Coat on Steel: Clean and degrease metal surface; apply one coat of primer; two coats of powder coat.
- B. Finish Paint for Metal Surfaces: Alkyd enamel, semi-gloss, color as selected, comply with VOC limitations of authorities having jurisdiction (AHJ).
- C. Clear Anodized Finish: Class I, AAMA 611 AA-M12C22A41 clear anodic coating with electrolytically deposited organic seal; not less than 0.7 mils, 0.0007 inch (0.018 mm) thick.

PART 3 EXECUTION

3.01 Examination

- A. Verify existing conditions before starting this work.
- B. Verify that hoistway, pit, machine room, and other elevators items 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 015000 - 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 260533.13 and 260583.
- D. Mount machines, motors, and other required items on vibration and acoustic isolators.
 - 1. Place on structural supports and bearing plates.
 - 2. Securely fasten to building supports.
 - 3. Prevent lateral displacement.
- E. Install hoistway, elevator equipment, and components in accordance with approved shop drawings.
- F. Install guide rails to allow for expansion and contraction movement of guide rails.
- G. Accurately machine and align guide rails, forming smooth joints with machined splice plates.
- H. 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.
- I. Structural Metal Surfaces: Clean surfaces of rust, oil, or grease; wipe clean with solvent; prime with two coats.
- J. Wood Surfaces not Exposed to Public View: Finish with one coat primer; one coat enamel.
- K. 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 014000 - Quality Requirements for additional requirements.
- B. Perform testing and inspection in accordance with requirements.
- 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. Set period of time elevator takes to travel between typical floor landings at not more than 12 seconds.
 - a. Measure time from moment doors start to close until car has stopped level at next floor landing and doors are opening.

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 (6.4 mm) maximum from flush with sill.

3.07 Cleaning

- A. See Section 017000 - Execution and Closeout Requirements for additional requirements.
- B. Remove protective coverings from finished surfaces.
- C. Clean surfaces and components in accordance with manufacturers written instructions.

3.08 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 before Date of Substantial Completion.

3.09 Maintenance

- A. Include systematic examination, adjustment, and lubrication of elevator equipment.
- B. Perform work without removing cars from use during peak traffic periods.

END OF SECTION